

Occasional Paper

Labour Market Programs, Unemployment and Employment Hazards

**An Application Using the
1994–1997 Survey of
Employment and Unemployment
Patterns**

New
Issue

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Labour Market Programs, Unemployment and Employment Hazards

**An Application Using the
1994–1997 Survey of Employment
and Unemployment Patterns**

Thorsten Stromback and A. M. Dockery

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INQUIRIES

- For further information about the analysis in this occasional paper, contact Mike Dockery on 08 9266 3468.
For information about the Survey of Employment and Unemployment Patterns, contact Mel Butler on Canberra 02 6252 5936.

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PREFACE

This occasional paper has been written by Thorsten Stromback and Michael Dockery of the Centre for Labour Market Research and Curtin University, under the auspices of the Survey of Employment and Unemployment Patterns Research Fellowship scheme. This scheme has been established to facilitate high quality analysis of the survey data by researchers who have experience in the analysis of longitudinal data and an in-depth understanding of labour market issues and operations.

This paper estimates the effectiveness of major labour market programs in assisting persons to make a transition out of job search and into sustained employment. The model used first examines how effective a range of major programs have been in helping job seekers find work. Second, for those job seekers who did find work, the model tests whether those who participated in a labour market program experienced longer spells of employment than those who obtained work without having participated in a program.

Barbara Dunlop
First Assistant Statistician
Social and Labour Division
Australian Bureau of Statistics

LIST OF ABBREVIATIONS AND OTHER USAGES

ABBREVIATIONS

ABS	Australian Bureau of Statistics
CD	Collection District
CES	Commonwealth Employment Service
DEETYA	Department of Employment, Education, Training and Youth Affairs
DEWRSB	Department of Employment, Workplace Relations and Small Business
DSS	Department of Social Security
LEAP	Landcare and Environment Action Program
LMP	Labour market program
NWO	New Work Opportunities
PPM	Post Program Monitoring
PRG	Population Reference Group
SE	Standard error
SEUP	Survey of Employment and Unemployment Patterns
TAFE	Technical and Further Education

SYMBOLS

*	Significant at the 10% level
**	Significant at the 5% level
***	Significant at the 1% level
P	Shape parameter for the Weibull distribution
. .	not applicable

ROUNDING

Because estimates have been rounded, discrepancies may occur between sums of the component items and totals.

A NOTE ON TERMINOLOGY

The units of analysis used in this paper are spells of labour market activity derived from the 1994–1997 Survey of Employment and Unemployment Patterns (SEUP). It needs to be noted that there are important definitional differences between labour market states as derived from SEUP and the more formally defined states of employed, unemployed and not-in-the-labour force based upon the Labour Force Survey.

The monthly Labour Force Survey, conducted by the Australian Bureau of Statistics, is the source of Australia’s official estimates of the labour force status of the population. The survey provides estimates of the number of persons within the working age population who are employed, unemployed and not in the labour force. These labour market states are determined according to very precise criteria based on responses to survey questions about their labour market activity during the survey week.

In the SEUP, labour market experiences are described in terms of self-reported spells of working, looking for work and absence from the labour market. These are similar but not strictly comparable to the states of employment, unemployment and not-in-the-labour force derived from the Labour Force Survey, which have a very specific and established technical meaning. To highlight this difference, the paper uses the terminology of “working”, “job search while not working” (or just “job search”) and “absent from the labour market” (or just “absent”) when referring directly to labour market states derived from SEUP data. The words “employment” and “unemployment” are, however, used in general discussion in their normal conversational or non-technical sense.

SYNOPSIS

This paper estimates the effectiveness, in a specific time-frame, of the major labour market programs which comprised the *Working Nation* set of measures implemented in response to Australia's high levels of unemployment and long term unemployment in the early 1990s. Program effects are estimated in a duration framework using data from the Survey of Employment and Unemployment Patterns (SEUP), a major aim of which was to assist in evaluation of labour market programs. The key indicator is the estimated impact of program participation on the rate at which persons exit episodes of "job search" into either the "working" or "absent from the labour market" states. The data and estimation techniques permit controls for a large number of individual characteristics, such as human capital variables, but the possible bias which may arise due to the process of selection into programs is not fully controlled for in this study.

The results indicate that participation in a labour market program is associated with a marked increase in the rate at which people leave spells of job search. While the SEUP measure of job search is not strictly comparable to the labour force status of unemployment, this is taken as evidence that program participation increases the rate of exit from unemployment. The dominant effect is an increased rate of exit to employment though, surprisingly, an increase in the rate of exit from the labour market is also observed. The magnitude of the estimated effect of program participation is very large, suggesting that much of the estimated effect arises from selection bias whereby persons who enter programs are already more likely to leave unemployment due to characteristics which cannot be observed in the data. Program participation is also estimated to lead to a longer duration of subsequent work spells. Thus it does not appear that programs place people disproportionately into short-term or dead end jobs.

Of the labour market programs considered, wage subsidy programs are found to have the most favourable impact upon participants, followed by brokered employment programs, job search assistance and finally training programs. This is consistent with previous government evaluations with the exception that brokered employment programs had been identified by DEETYA as being no more effective than training or job search programs. Transition models are used to replicate DEETYA's approach and to illustrate the effect of incorporating additional variables available in SEUP, such as those relating to labour market history; marital and family status; birthplace and English language proficiency; utilisation of social security support and employment services. The finding of the greater relative effectiveness of brokered programs remains when this approach is applied to the SEUP data. Rudimentary controls for the effect of selection into programs are also included in the transition models. These results are inconclusive, but the strong positive effect of participation in wage subsidy programs stands.

SECTION 1

INTRODUCTION

This paper uses longitudinal data from the SEUP to assess the effect of participation for the major types of labour market programs (LMPs) that were available to the unemployed in Australia during the survey period. A “hazard” model is estimated to show how the rate of exit out of job search into employment or out of the labour market varies over the duration of a spell of job search. A Weibull specification of the hazard model is used to provide estimates of the effect of personal and other factors, including program participation, on the hazard. A similar model was then applied to spells of work that followed a spell of job search. This was used to determine whether participation in a labour market program had a positive effect on the duration of the subsequent work spell. Finally, “transition” models are used to investigate differences between the results of the hazard models and previous evaluations with respect to the estimated impacts of program participation and the potential effect of selection bias upon the results.

Section 2 contains a brief history of the development of the labour market programs to be evaluated in this paper. Section 3 provides a general background to the evaluation of labour market programs before the data (section 4) and specific approach (section 5) used in this study are discussed. Sections 6 and 7 contain the results from the regression models of the exit rate from spells of job search and the exit rate from subsequent spells of work, respectively.

By approximating the evaluation approach used by DEETYA, section 8 investigates how the estimated program effects change as additional controls for background characteristics and selection bias are incorporated into the analysis. Section 9 summarises the main conclusions to be drawn from the study.

SECTION 2

LABOUR MARKET PROGRAMS IN AUSTRALIA

Labour market programs are publicly funded measures to assist the unemployed to find work or otherwise improve their labour market outcomes. The major forms of programs are job brokerage (matching of people to job vacancies); assistance and training in job search; skills training; employment subsidies and direct creation of job placements for unemployed persons. Labour market programs are also commonly referred to as “active” labour market programs, to make the distinction from passive support for the unemployed, such as unemployment benefits. Programs are often targeted at persons considered to be disadvantaged in the labour market, such as the disabled, persons with language difficulties, workers in the youngest and the oldest age groups and those displaced from declining occupation or industry sectors. The long term unemployed provide a convenient “catch all” target group, as those with either observable or unobservable disadvantages will, by definition, be disproportionately represented in this group. Further, it is generally accepted by labour economists that a person’s chance of finding employment falls with increased duration in unemployment, such that unemployment duration in itself constitutes a disadvantage in job search (see, for example, Chapman 1994: 4–5).

Australia’s unemployment rate reached a peak of 11% during 1992–93 and the number of long term unemployed rose to almost 300,000 soon after. In 1993 a Committee on Employment Opportunities was appointed to advise the Government on appropriate responses to the problem. The Committee’s recommendations were adopted in the then Government’s May 1994 White Paper, *Working Nation*, which outlined a strategy for a significant expansion of active labour market assistance targeted at the long term unemployed. The major element was the Job Compact, which guaranteed a job placement to all persons who had been unemployed for more than 18 months.

At this time, the major labour market programs in place in Australia were a wage subsidy program, JobStart; a range of skills training programs including SkillShare and JobTrain; brokered employment programs such as JobSkills and the Landcare, Environment and Action Program (LEAP), essentially job creation programs which provided funds for projects of community value that would employ job seekers; and a Job Club program providing assistance in job search and targeted at the shorter term unemployed. More details on the nature of each of the main programs can be found in Appendix A.

In the context of Australian labour market assistance policy, an important innovation of *Working Nation* was the embodiment of an evaluation strategy within the set of assistance measures. A key element of this strategy was a longitudinal survey of Jobseekers, the SEUP, which ran over three years from September 1994 to September 1997. Although a change of government in March 1996 brought about the abandonment of the Job Compact by name, its essential elements of a high level of assistance targeted at the long term unemployed remained largely intact, along with the major individual programs, for the duration of the survey (Stromback and Dockery 1998).

SECTION 3

LABOUR MARKET PROGRAM EVALUATION: BACKGROUND

In this section the evaluation of labour market programs is discussed. First we consider how the impact of different labour market effects can be accounted for. The use of duration analysis as an appropriate technique to evaluate labour market programs is then introduced.

ACCOUNTING FOR LABOUR MARKET EFFECTS

Rigorous evaluation of the effectiveness of labour market programs is very difficult and methodological challenges have led to the development of complex econometric techniques. In estimating the overall or macroeconomic impact of a program, a diverse range of potential labour market effects needs to be taken into account.

Calmfors (1994) identifies nine different effects that need to be considered in the evaluation of programs. In particular, the net impact of a program can be overstated if the evaluator does not sufficiently allow for “deadweight” losses and “displacement” effects. Deadweight losses refer to the assistance of people who would, in any case, have found employment without participating in the program. Displacement occurs when the program simply assists participants into employment at the expense of others, rather than generating new employment opportunities.

Displacement effects

The objectives behind labour market programs often relate to equity outcomes as well as those of economic efficiency. At the microeconomic level, the outcome of programs is judged by the post-program labour market status of participants. The crucial question is to what should this outcome be compared in order to ascertain the net impact of the program. Displacement effects are not as important a consideration in micro or individual level evaluations if the objective is to improve the labour market status of a particular disadvantaged group. Provided the program can be effectively targeted, then gains in the employment status of participants still achieve that objective even if participants displace other workers. Further, in the case of the long term unemployed, economic thought now suggests that simply rotating the pool of unemployed has efficiency advantages in itself by maintaining a more effective level of competition between the employed and the unemployed (Norris 1996: 246–248).

Deadweight loss

This study is concerned only with estimating the effects of programs on the participants. Hence it is not concerned with displacement effects, but allows as far as possible for deadweight loss. Formally, consider an outcome variable Y , say employment status, which is observed for participants and non-participants in a given program. Let P be a dummy variable indicating an individual's participation ($P=1$) or non-participation ($P=0$) in the program.

$$(1) \quad \begin{array}{ll} Y = Y_1 & \text{if } P = 1 \\ Y = Y_0 & \text{if } P = 0 \end{array}$$

The evaluation question is: "What is the effect of the program on those who participated?". Ideally, we would like to observe Y_1 and Y_0 for the same individual, and the difference between the two would represent the effect of the program. In reality, at any point in time, we can observe only Y_1 or Y_0 for any one individual—they have either participated or they have not. Hence, the usual approach is to take the Y_0 observed for non-participants as a proxy for what Y_0 would have been for the participants in the absence of the program, while controlling for other individual specific characteristics which may affect the outcome variable, such as human capital variables. The non-participant group for which Y_0 is observed represents the control or comparison group. With the availability of longitudinal data, such as SEUP, observations on the outcome variables Y_0 and Y_1 can be made for the same individual at different points in time (i.e. before and after participation), as well as across different individuals.

Selection bias

Labour market program evaluation is characterised by increasingly sophisticated attempts to establish the counterfactual: what would have happened to the participants in the absence of the program? Even with longitudinal data or closely matched control groups, it is likely that persons who enter into programs or who are selected by program administrators are intrinsically different from those who don't. Such differences may be in the form of attributes which are unobservable to the evaluator, such as motivation, and cannot be controlled for in estimating the outcome of the program. Hence the estimated effect of the program may be subject to "selection bias", that is the estimated outcomes are a result of the process of selection into the program rather than the effect of the program treatment *per se*.

Econometric techniques have been developed to control for selection bias in evaluative studies, mainly through the work of American economist James Heckman. Controls for selection into programs have not been incorporated into the main analysis in this paper, other than to the extent that many of the variables which are likely to affect both selection and outcomes are included. A standard procedure developed by Heckman (1979) is tested in the transition models of section 8. While both these

measures represent an improvement on previous Australian program evaluations, more sophisticated techniques to eliminate selection bias are still warranted for any future work using the SEUP data.

DURATION ANALYSIS

Using data from a longitudinal survey, there are a number of ways in which to estimate the effect of participation on employment outcomes. Most of these rely on observing the employment status or change in status of participants and non-participants at a particular point in time. However, the necessarily arbitrary choice of time reference points involves some loss of information. An unemployed person may have gained a number of jobs or spent a considerable time in employment leading up to the reference point or may gain employment immediately after. A person observed to be employed at the reference point may have been in unemployment for the period leading up to the reference point, and return to unemployment soon after.

Hazard models

Models which more fully utilise the available information are based on the analysis of the duration of observed spells, in this case the duration of spells in a certain labour market state. A comprehensive technical treatment of this class of models can be found in Cox and Oakes (1984). The two key functions in duration models are the survival and hazard functions. The survival function gives the proportion of the population who remain, or “survive”, in the state up to a certain duration. Thus the proportion of spells of unemployment which last for 12 months or more is an example of a survival rate. The hazard function is the likelihood that a spell will end in the following interval, given that it has already lasted up until that point. For example, if a person has remained in unemployment for twelve months, what is the likelihood that they will exit unemployment in the following period?

Censoring of spells

The SEUP data is well suited to analysis by duration models as it provides information about the start and end date of each spell. However, many spells were still in progress at the time the last wave ended (September 1997). In such spells only the elapsed duration, not the complete duration, is known. In econometric jargon these spells are “right censored”. Right censoring inevitably involves some loss of information since the eventual duration is not known. However, it is still possible to obtain unbiased estimates of the underlying duration distribution and the associated survival and hazard functions—the estimation procedure takes into account the fact that the spell has lasted *at least* up to the point of censoring.

SECTION 4

DATA: THE SURVEY OF EMPLOYMENT AND UNEMPLOYMENT PATTERNS

SEUP provides an invaluable, though also very complex, set of data on labour market experiences in Australia. Detailed descriptions of the survey sample and the data can be found in a series of ABS SEUP Information Papers and in ABS Catalogue no. 6286.0.

SURVEY BACKGROUND

Briefly, the survey follows a panel of persons aged 15 to 59 years over a period of three years from September 1994 to September 1997. Survey data is collected on personal characteristics, including rich data on labour market history, and for each episode of labour market activity experienced during the reference period. These can be episodes of “working”, “looking for work” and “absent from the labour market”. The first two are not mutually exclusive, i.e. a looking spell can overlap a working spell. It is important to note this difference between the SEUP defined looking for work episode, and the conventional definition of unemployment, in which the states of unemployment and working are mutually exclusive. The reason for this classification is the retrospective nature of the survey. At the survey date, the respondents are asked about their labour market activities during the preceding 12 months. It would be too difficult to establish the exact criteria to classify people into the usual categories of employed, unemployed and not-in-the-labour force, as used in the Labour Force Survey, for a full 52 weeks.

The panel comprises three sub-samples: Jobseekers; a population reference group (PRG); and a sample of persons known to have participated in a labour market program. The survey sample sizes in each wave of the survey are shown in table 4.1.

4.1 SEUP: INITIAL SAMPLE SIZE AND ATTRITION, BY SUB-SAMPLE

<i>Sub-sample</i>	<i>Wave 1 (1994–1995)</i>	<i>Wave 2 (1995–1996)</i>	<i>Wave 3 (1996–1997)</i>
PRG	2 311	2 120	1 983
Jobseekers	5 488	4 779	4 261
Labour market program participants	1 019	888	775
Total	8 591	7 585	6 831

(a) There is some overlap between the PRG and Jobseeker samples. In the first wave, 227 persons were a member of both samples.

ADMINISTRATIVE DATA

The unique aspect of SEUP is that, for consenting persons, the survey data was matched to administrative records from the (then) Departments of Employment, Education, Training and Youth Affairs (DEETYA) and Social Security (DSS). The DEETYA data include dates of registration with

the Commonwealth Employment Service and if and when the person received case management. Most importantly, it includes information on periods of participation in labour market programs: dates of participation, type of program, completion status of the program and the education and employment outcome as derived from DEETYA's post program monitoring. DSS records comprise data on periods of income support and the type and amount of benefit received, including unemployment benefits.

Matching rates

Since the matching of survey data with DEETYA and DSS records required the consent of the respondents the matching is not complete. Of particular concern here is the coverage of data on program participation. For the three samples combined, 72% of persons agreed to having their DEETYA administrative records included (see table 4.2). After matching, this left 56% of the combined sample for which these data items are available. The ABS has expressed the view that the major reason for both non-consent and matching failure is likely to be that the respondent had not been a client of the Departments, and hence no records would have existed in any case. This seems plausible in view of the marked differences in consent and matching rates between the various sub-samples. While there is a high consent rate for Jobseekers and known labour market program participants the consent rate is far lower for the PRG, who are less likely to have been clients. Further, there is a far greater difference between the consent rate and the matching rate for the PRG, indicating that when consent was given, far fewer from this group were found to have administrative records. We proceed on the assumption that missing observations for DEETYA and DSS data items imply that no such spells of activity were undertaken.

4.2 CONSENT AND MATCHING RATES FOR DEETYA AND DSS DATA ITEMS, BY SUB-SAMPLE

<i>Sub-sample</i>	<i>no.</i>	<i>DEETYA</i>		<i>DSS</i>		<i>BOTH</i>	
		<i>Consent</i>	<i>Match</i>	<i>Consent</i>	<i>Match</i>	<i>Consent</i>	<i>Match</i>
		%	%	%	%	%	%
PRG	2 311	39	15	48	17	37	7
Jobseekers	5 488	82	67	82	49	78	39
LMP participants.	1 019	92	90	89	52	88	50
Total	8 591	72	56	74	40	67	32

Only persons who remained in the survey for the full three years are included in this analysis. From the DEETYA administrative data, a total of 5,809 spells of participation in a labour market program were found for these persons. We adopt the classification of programs into the following main groups as provided in the SEUP data and as commonly used by DEETYA in their program reporting. These are:

- Training programs—encompassing Skillshare, Jobtrain and Special Intervention Programs;
- Wage subsidy programs—the Jobstart program;
- Brokered and other employment based programs—including Job Skills, New Work Opportunities (NWO) and the Landcare and Environment Action Program (LEAP); and
- Job search assistance—Job Clubs.

There were a total of 5,282 spells of participation in these programs, comprising 91% of all labour market program spells recorded (see table 4.3). The remaining programs comprised “employment support” programs and a small number of apprenticeships and traineeships.

These four main groups also include the programs which offer the most extensive form of assistance, extending for up to six months and targeting the most disadvantaged job seekers. The wage subsidy scheme meets 50–75% of the wage cost of a participant, the brokered and other employment based programs pay for the training provided by an accredited training organisation and/or subsidise the job placements. The NWO, for example, pays 100% of the wage cost. Wage subsidy and brokered employment programs are also the most expensive in budgetary terms and accounted for about one half of the total Commonwealth expenditure on labour market assistance. A brief description of each of the sub-programs is provided in Appendix A.

4.3 SPELLS OF LABOUR MARKET PROGRAM PARTICIPATION—1994–1997

<i>Program type/Program(a)</i>	<i>Number of program spells</i>	<i>Average duration of program (weeks)(b)</i>
Training		
Special intervention, Skillshare, Jobtrain	3 122	9
Wage subsidy		
Jobstart	878	22
Brokered and other employment programs		
Jobskills, LEAP, New Work Opportunities	787	23
Job Search Assistance		
Job Clubs	495	2

(a) Includes some spells classified as “other” in addition to these sub-programs.

(b) Calculation includes completed spells only.

SECTION 5

MODEL SPECIFICATION: THE EFFECT OF LABOUR MARKET PROGRAM PARTICIPATION ON UNEMPLOYMENT AND EMPLOYMENT DURATION

This chapter sets out the framework for the evaluation. First, the objectives of labour market programs are stated and their theoretical underpinnings discussed in the context of search theory and job matching theory. The hazard model to be estimated, as a test of whether or not those objectives are achieved, is then specified. The final section of the chapter provides details on the sample and the derivation of the spell data used in the estimation of the model.

As indicated in the introduction, this paper seeks to assess the effect of participation in labour market programs on both the duration of job search and of the working spells following periods of job search. There are policy and theoretical motivations for considering the effect of labour market program participation on both types of spells.

OBJECTIVES OF LABOUR MARKET PROGRAMS

The objective of labour market programs is not just to assist participants to find a job but to secure sustainable improvement in employment outcomes. This is a longer term objective and the principal indicator of the outcome is the labour market status of a participant some time (3, 6 or 12 months) after completion of a program. This post program status clearly depends on whether a participant has found a job and, if so, whether they have remained in employment. Within a duration framework the first issue translates into a question about the effect of program participation on the unemployment-to-employment hazard while, for individuals who have found work, the second issue concerns the effect of participation on the out-of-employment hazard.

THEORETICAL CONSIDERATIONS

Approaching the problem of evaluating the effect of labour market programs from a theoretical perspective also suggests that the duration of both the unemployment and subsequent employment spells may be affected by program participation.

The search model

The standard search model of unemployment envisages that an individual searches for job offers and that the decision to accept or reject each offer is based on the expected value of the offer relative to continued search. Additional assumptions are evoked to specify the rate at which offers are received, the wage distribution associated with these offers, the cost of search and the discount rate (the rate at which future earnings are discounted to give present value equivalents). As regards the post program period of unemployment, this theory suggests that program

participation can have several effects. Program participation provides participants with a wide range of information: about particular jobs and industries, contacts with employers and access to informal networks. This would decrease the cost of search and lead to a more intense and efficient search process. Second, program participation can improve the human capital of participants—through the acquisition of useable skills and by restoring work habits and attitudes. In theory this results in a more favourable wage distribution and a greater chance of receiving job offers but, possibly, also a higher reservation wage—the minimum wage at which the job seeker is willing to cease job search and accept employment (see Carling, Edin, Harkman and Holmlund 1996).

Job matching theory

As regards re-employment duration, matching theory postulates that the duration of a job depends on new information about the job and alternative opportunities. A job match is initially formed based on the expectation that the match is profitable to both parties in light of the information available at the time the match is made. As the match progresses new information is received and the prior evaluation of the value of the job and alternative opportunities updated. The more precise is the prior information the smaller will these revisions be. Thus, matches based on precise priors (more information) are likely to last longer than matches based on imprecise priors. This perspective suggests that both the intensity and duration of search for a job have an effect on the duration of the job eventually accepted. More intensive and longer search should result in more information and, hence, longer lasting jobs. However, to further complicate matters, the empirical literature suggests that duration of unemployment could have a negative effect on subsequent employment duration (see Meyer 1990, Wolpin 1987). For example, the scarring effect of long unemployment duration can restrict the alternatives for those who have been unemployed for a long time to low paying and dead-end jobs which have a short life.

Effect of LMPs on re-employment

The link between subsequent employment duration and labour market program participation would then arise because the intensity and duration of the prior search is affected by program participation. The effect of participation on search intensity is a direct effect which motivates the inclusion of an indicator of program participation in the out-of-employment hazard. In the case of duration the argument is that, to the extent that program participation would shorten the duration of unemployment, participation will also affect the subsequent employment duration indirectly. This “indirect” duration effect of program participation may be positive or negative depending upon the relative strengths of the underlying effects. On the one hand, shorter duration of job search reduces any scarring effect of time in unemployment, thereby increasing the expected duration of the subsequent employment spell.

On the other hand, shorter duration of job search may lead to poorer quality matches and hence shorten the expected duration of the subsequent employment spell.

Irrespective of the sign of the effect, subsequent employment duration depends on the completed duration of unemployment which then should be included as an additional co-variate in the out-of-employment hazard. However, the direct estimation of such an effect raises problems of identification and the consistency of estimates in the presence of unobserved heterogeneity. Since program participation also affects job search duration, and there are likely to be unobserved individual characteristics influencing these two variables as well as the subsequent employment duration, the inclusion of both variables in modelling the duration of subsequent work spells would make it difficult to disentangle the true underlying effect. The more pragmatic approach adopted here is to estimate a reduced form equation—all the individual characteristics which determine the duration of job search, including program participation, are included in the equation for the out-of-work hazard, but not duration of job search itself.

The theories outlined above provide ambiguous predictions about the effect of program participation on the duration of both job search and subsequent employment spells. On balance, the expectation is that at least the duration of job search is reduced by program participation on the grounds that the only effect operating in a different direction, a higher reservation wage, is small. As regards the subsequent employment duration, the relative strength of the various effects of program participation is more difficult to judge.

The model specification

The most common approach for estimating the effect of labour market program participation in a duration framework has been to regard program participation as one of three mutually exclusive states, “employment”, “non-employment” and “program participation” (for example, Gritz 1993). While this approach can allow for selection into programs, treating participation as a spell effectively compares the participants’ post participation unemployment hazard with that of the non-participants. In other words, the participants’ “unemployment duration clock” is re-set to zero upon completion of a program and thus compared to those who have just entered unemployment from employment. This comparison seems inappropriate as program participants typically have a long period of prior unemployment.

Since the principal eligibility criterion for program participation is the duration of unemployment, as indeed was the case for the Job Compact measures, an alternative approach is to regard participation as an activity which is undertaken while unemployed and to measure its effect by time varying co-variates (Rosholm 1997). Thus three mutually exclusive states

are considered in this study; “working”, “job search” and “absent from the labour market”. Program participation is treated as a process operating in parallel with job search but the selection into programs is not incorporated into the hazard models.

Based on the non-parametric estimates of the out-of-job search and out-of-work hazards for the SEUP data, the Weibull model is used in which the hazard at time t is given by

$$(2) \quad b(t) = \lambda_i p(\lambda_i t)^{p-1}$$

where p is the shape parameter of the hazard function. The hazard is increasing, constant or decreasing with duration as $p > 1$, $p = 1$ or $p < 1$, respectively. Unemployment is commonly thought to display a decreasing hazard; that is, the chance of leaving unemployment in each period falls as the duration of the spell of unemployment increases. The effect of co-variates, including program participation, is incorporated by specifying lambda as

$$(3) \quad \lambda_i = e^{-(x_i \beta + D_i(t) \gamma)}$$

where x is a vector of individual characteristics and β the associated parameter vector. $D_i(t)$ is the program participation indicator. It is to be noted that $D_i(t)$ is a time varying co-variate in the out-of-job search hazard, being zero in the pre-participation period through to the point of completion of the program, and one in the post-participation period. In the out-of-work hazard, $D_i(t)$ is a constant for each individual and set equal to one if the individual participated in a program during the preceding spell of job search.

The models were estimated with LIMDEP using the estimator which allows for heterogeneity in the survival distribution, and therefore hazard functions, across individuals.

ADJUSTMENT OF WORKING AND LOOKING FOR WORK SPELLS

Labour market spells in SEUP could be either working, looking-for-work or absent from the labour market. Working and looking-for-work spells could overlap to reflect the fact that both employed and unemployed persons engage in job search activity. However, the main interest in this analysis is with the rate of exit from unemployment. The best approximation to the state of unemployment available from the SEUP data is time spent looking for work while not actually working. Therefore, to estimate the hazard models using the SEUP data, the original spell data was adjusted to generate three mutually exclusive spells of “working”, “job search” and “absent”. This involved adjusting the existing looking-for-work spells for any overlap with working spells to derive spells that might more fully be termed “job search while not working” spells, but for convenience are termed “job search” spells.

As previously discussed, periods of program participation are treated in this study as an activity taken in parallel with job search. However, respondents often reported program participation as a spell of working in their survey responses. Therefore it was necessary to adjust the data such that reported time spent working concurrently with program participation was reclassified as the continuation of a spell of job search. This is made more complicated by the fact that the dates for participation are derived from administrative records, while the start and end dates of working spells are derived from respondents' recall during the survey interview. Hence, there is often an imperfect match between the two.

Table 5.1 shows results from matching individuals' spells of program participation with their survey responses regarding labour market activity. It can be seen that persons in subsidised employment (JobStart), subsidised on-the-job training (Jobskills) or publicly created work opportunities (NWO and LEAP) were likely to respond that their labour market activity at the time was "working". However, persons receiving job search assistance or external training generally indicated that they were looking for work.

5.1 MATCHING OF LMP PARTICIPATION AND REPORTED LABOUR MARKET ACTIVITY

<i>Program type/Program</i>	<i>Spells associated with a working spell (per cent)</i>	<i>Spells associated with a looking for work spell (per cent)</i>
Wage subsidy		
Jobstart	71	12
Brokered and other employment		
Jobskills	74	15
NWO	62	12
LEAP	30	38
Training		
Skillshare	6	72
Jobtrain	4	68
Special Intervention	3	67
Job Search Assistance		
Job Clubs	5	81

Source: Internal ABS analysis (unpublished).

To deal with this, periods of working (or absence from the labour market) were recoded as periods of job search only where they overlapped with participation in a labour market program. Further, a maximum of two weeks mismatch was permitted between the survey response dates and those contained in the administrative records. So where the recalled beginning (end) date of a working or absent spell was within two weeks of the administratively recorded beginning (end) date of a program, the former was "corrected" to the administrative date. Otherwise the survey responses were taken to reflect legitimate dates. However, periods of program participation were not included as a spell

of job search unless they were also associated with a reported spell of looking for work, either leading up to or following participation in the program. Hence a period of program participation completely contained within a working or absent spell, even after allowing for two weeks mismatch in the reported dates, would not be included in the analysis.

This may be seen more clearly with the assistance of figure 5.2. Panel 1 represents a simple case in which the survey responses report a looking for work spell from time A to time B. From B onwards the survey data record a working spell, while the administrative data record an episode of labour market program participation from time B to C. It seems obvious in this case that the person entered a labour market program—probably a wage subsidy program or brokered employment program—at time B and reported this in the survey as a spell of working. The adjustment process extends the job search spell to time C. Upon the completion of the program the person entered a working spell, possibly being retained by the host employer during the program. The duration of the created job search spell becomes AC. The duration from completing the program to leaving the job search spell is one day.

Panel 2 shows a situation in which the survey data records a working spell (C to D) contained within a looking-for-work spell. Had it not been for the presence of the program running from time B to time E, the adjustment would have broken the looking-for-work spell into two job search spells: A to C and from D onwards; and a spell of work from C to D. However, because the recalled start and end dates of the working spell correspond to those of the administratively reported start and end dates of the program B and E, allowing a recall error margin of plus or minus two weeks, the reported working spell is taken to correspond to the episode of program participation. Hence the looking-for-work spell is instead adjusted to be a continuous job search spell from A onwards which contains a concurrent period of program participation from time B to E.

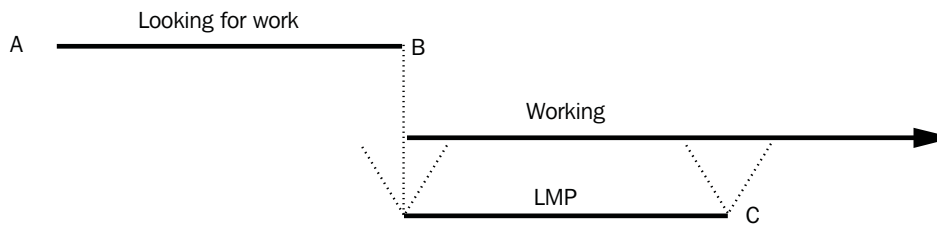
Panel 3 shows a situation in which a program occurs within a working episode, even after allowing for an error of plus or minus two weeks in the survey recall dates. The working spell B to E is therefore taken to represent a legitimate working episode. The episode of program participation would not be included in the analysis, as there is no corresponding job search spell.

Sample description

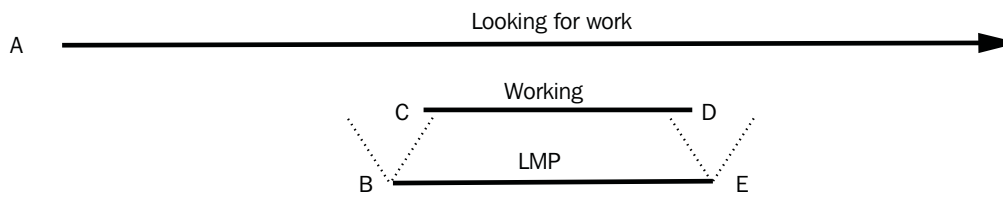
Data for persons from all three sample groups are included, provided persons remained in the survey for the full three waves. Dummy variables indicating the sample to which the individual belongs are included in the estimation to allow for the fact that differences between persons in the three sample groups may not be fully captured by the other independent variables.

The original data set included 8,885 looking-for-work spells. The adjustment process described above resulted in 9,447 job search spells available in the estimation. The principal reason for the increase is that looking-for-work spells interrupted by periods of working were broken up into several job search spells. In regard to spells of program participation, 643 spells could not be located within a job search spell. Thus the original number of 5,282 spells was reduced to 4,639 spells of program participation. A job search spell can contain multiple episodes of program participation, thus these 4,639 episodes of program participation were contained within 2,616 (out of the total 9,447) job search spells. Further details about the differences between the original and adjusted data are given in Appendix B.

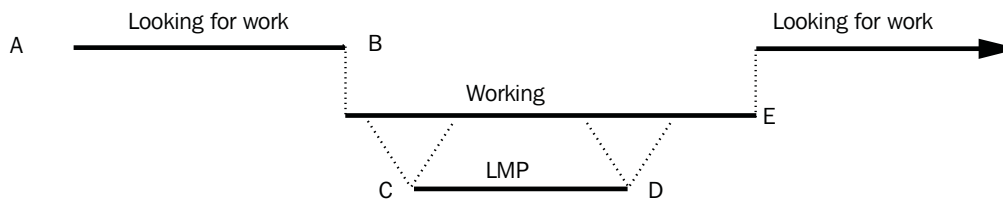
FIGURE 5.2 ADJUSTMENT OF WORKING AND LOOKING SPELLS



Panel 1



Panel 2



Panel 3

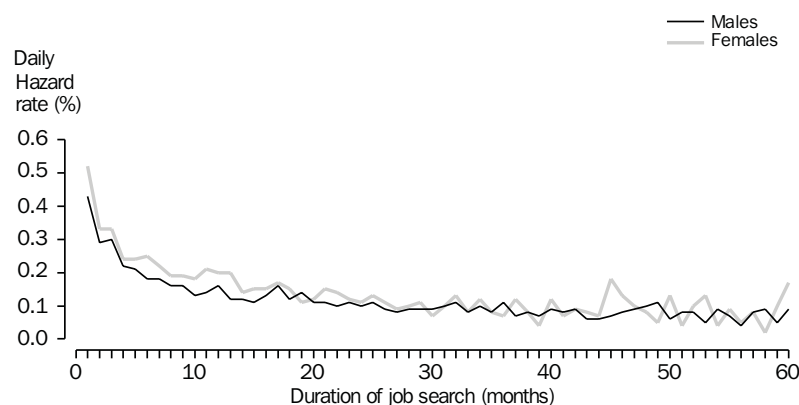
SECTION 6

THE HAZARD OUT OF JOB SEARCH

This section reports the results of the estimation of the hazard function for spells of job search. A plot of the data is provided to confirm that the Weibull model is an appropriate specification. The initial model estimates the hazard rates from job search into either work or absent spells and incorporates an indicator of participation in any type of labour market program. The estimated effects of the other control variables (such as personal characteristics) are discussed before concentrating on the impact of participation in a labour market program. This is expanded upon by separate estimation of the impact of the four different types of program. The same procedure is then followed using a “competing risks” specification. This provides separate estimates of the effect of individual characteristics and program participation on the rate of exit from job search to (a) a work spell, and (b) a spell of absence from the labour market.

The data used in estimation consists of 9,447 job search spells, of which 2,616 included at least one spell of participation in a labour market program. The non-parametric estimates of the out-of-job search hazard function are plotted in figure 6.1. This shows the rate at which individuals leave spells of job search. During the first month of a spell of job search, females, for example, leave job search spells at an average rate of around half of one percent per day. The hazard is generally monotonically declining, that is, the underlying hazard falls continuously as duration increases.

FIGURE 6.1 NON-PARAMETRIC ESTIMATES OF THE OUT-OF-JOB SEARCH HAZARD(a)



(a) Spells longer than 5 years censored.

RESULTS FROM THE WEIBULL MODEL

The results from fitting the Weibull model which incorporates a participation dummy reflecting participation in any type of program are given in table 6.2. All co-variables are one-zero dummies with the exception of the labour market history variables (years of paid work and years of looking for work), level of education and a socio-economic index of the respondent's collection district. From specification of equation (3) that $\lambda_i = e^{-(x_i^{\beta+D_i(t)\gamma})}$, a negative sign on the estimated coefficient indicates that the hazard or the escape rate out of the job search state, our proxy for unemployment, is increasing with that variable. For example, the negative coefficient on the variable "Would move interstate" shows that willingness to move increases the hazard or escape rate from job search. This in turn means the expected duration of the spell is decreasing. Conversely, a positive coefficient implies the escape rate is a decreasing function of that variable, and the expected duration of the job search spell is increasing.

Age, sex and marital status

As regards the effect of personal characteristics the results generally correspond to previous findings in the literature. Compared to 25–44 year old persons, older Jobseekers have a significantly lower out-of-job search hazard—that is, a slower rate of exit from the state of job search—as have those born in non-English speaking countries when compared to their counterparts from Australia and other main English speaking countries. The effect of gender is small and only weakly significant, suggesting that males and females experience similar rates of exit from job search spells when other factors are controlled for. Being married increases the escape rate out of job search spells, but this effect is almost precisely offset by the presence of dependants in the marriage. However, being a female with a young child is associated with a higher escape rate, presumably as a result of exits out the labour force rather than into employment.

English proficiency

The hazard is lower for persons whose first language is not English. Within this group, however, the exit rate from job search increases with the level of English proficiency, such that the hazard rate for those with good or very good English is not significantly different from the rate for those who speak English as their first language.

6.2

ESTIMATED HAZARD OUT OF JOB SEARCH, EFFECT OF PARTICIPATION IN ANY LABOUR MARKET PROGRAM—1994–1997

Variable	Coefficient	t-ratio	Mean
Constant	6.10 ***	46.28	—
Program participation	-1.58 ***	-35.81	0.25
Sample sub-group, PRG			
Jobseeker	0.51 ***	8.64	0.80
LM program participants	1.03 ***	14.20	0.13
Male	-0.09 **	-2.45	0.56
Age 15–19	-0.01	-0.16	0.14
Age 20–24	0.06	1.17	0.19
Age 25–44	—	—	—
Age 45–54	0.25 ***	4.58	0.15
Age 55–59	0.48 ***	4.93	0.04
Birthplace			
Australia	-0.16 **	-2.00	0.74
Main English speaking country	-0.25 ***	-2.70	0.09
Married	-0.15 ***	-2.92	0.44
Married with dependents	0.15 ***	3.10	0.28
Female with child less than 3	-0.16 **	-2.16	0.05
English proficiency			
English first language	—	—	—
Speaks English well/very well	0.09	1.28	0.08
Speaks English fairly well	0.38 ***	3.75	0.07
Speaks English not well/not at all	0.62 ***	4.56	0.02
Has disability	0.18 ***	3.77	0.31
Disability impedes employment	-0.10 *	-1.84	0.21
Socioeconomic index (of CD)	-0.02 ***	-4.54	4.60
Labour market history			
Experience (years working)	0.00	0.50	11.27
Years looking for work	0.16 ***	24.63	2.65
Level of education (0 to 14)	-0.03 ***	-6.65	4.83
Union member	-0.50 ***	-10.13	0.09
Spouse works full-time	-0.31 ***	-6.25	0.16
Looking for full-time or part-time work			
Full-time work only	0.09 ***	2.77	0.43
Part-time work only	0.01	0.21	0.17
Would move interstate	-0.71 ***	-13.17	0.89
Received income support	0.35 ***	6.59	0.52
Received unemployment related income support	0.58 ***	5.24	0.41

no.

Job search spells	9,447
Program participants	2,378
Log likelihood	-54,208
P (Weibull distribution)	0.73
Median of job search duration (days)	238

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Socio-economic index

The socio-economic index for area (SEIFA) allocated respondents' geographical collection district into deciles of a socio-economic disadvantage index. The variable is based on many factors, including the proportion of persons living in the area in unemployment, in low paid employment and with low levels of education. As would be expected, persons from areas of higher socio-economic status are estimated to have a higher hazard and, on average, experience shorter job search spells.

Labour market history

Previous years of looking-for-work have a relatively large and negative impact on the job search hazard, thereby reducing the rate of escape from the job search state. This could be interpreted as a “scarring” effect of unemployment, but may equally be capturing individual specific characteristics associated with a higher likelihood of experiencing unemployment. The exogeneity of this variable is, however, questionable. If the current looking-for-work spell began before September 1994 the variable includes the elapsed duration of the current spell up to that time. This variable is one of three summary labour market history variables included in the data set. The other two are years working and years absent from the labour market since leaving full-time education. The sum of these three variables should equal age minus years of education, so at least one of the five must be excluded to avoid a linear dependence. In this case years of absence from the labour market has been excluded.

Union membership

Being a union member is associated with a significant and considerably larger rate of escape from job search. However, this finding is likely to be primarily a result of “reverse causality”. That is, people drop their union membership if they experience long periods of job search, rather than leave job search more quickly because they are a union member. It may also partially reflect the characteristics of those industrial and occupational labour markets that are most highly unionised.

Education

The variable measuring the level of education is an index based on the highest qualification obtained, and is roughly equivalent to the number of years in post-compulsory education divided by two. The coefficient implies that the hazard is increasing in the level of education, such that more educated job seekers leave job search spells sooner. However, the estimated effect of each additional year is quite small. The coefficients imply that having a spouse who works full-time has an effect on the hazard rate equivalent to 5 years of additional education.

Labour force status of spouse

Having a spouse who works full-time is estimated to have a positive impact on the escape rate from job search spells.

Full-time or part-time work

The out-of-job search hazard is lower for persons looking specifically for full-time work compared to those who were looking for either full-time or part-time work. The coefficient on the remaining category, looking for part-time work, is not significant.

Mobility

For each looking for work spell, persons were asked whether or not they would be willing to move interstate for work. Willingness to move was significantly associated with a faster escape rate out of the job search state. This reflects the positive effect of mobility on the chance of finding work as well as a higher commitment to finding employment.

Income support

Receipt of income support was found to significantly decrease the escape rate from job search. This was even more so when the income support was unemployment related.

While this is suggestive of a disincentive effect, other factors may be at work. For example, income support is more likely to be claimed in job search spells of longer duration, and those with a high probability of exiting job search within a relatively short period may be less likely to claim income support.

Main explanatory factors

The magnitude of these last two effects—willingness to move and receiving income support—are quite large. Note that the effects of receiving income support and of that support being unemployment related are additive. Along with these, the most important determinants of the out-of-job search hazard rate appear to be age, years of prior job search, English proficiency and union membership status. Even after allowing for differences in these characteristics, the coefficients on the variables reflecting the sample group into which the person was recruited are large and highly significant. Persons from the Jobseeker sample, and particularly those from the group of known labour market program participants, have lower escape rates from the job search state than those from the Population Reference Group. Hence, a considerable portion of the difference in individual hazards is attributable to personal characteristics which are not reflected in the other variables included. The value of the shape parameter, P , of around 0.75 (table 6.2) indicates that the hazard is decreasing with time, consistent with figure 6.1. Given that the estimator controls for heterogeneity¹, this provides some evidence of the existence of negative duration dependency in unemployment.

1 The presence of heterogeneity means that the hazard rate differs across spells due to unobserved individual specific characteristics. Empirically, this gives the impression of duration dependence—the chance of exiting falls as the duration of the spell increases—because those with lower individual specific hazards experience longer duration spells; even though the hazard rate for each individual may not fall with duration. The estimator enables a degree of control for this by allowing the hazards to be distributed across individuals rather than assuming individuals are homogenous in their hazards after controlling for the included variables.

THE EFFECT OF PROGRAM PARTICIPATION

The coefficient on the variable indicating that the individual has participated in a labour market program indicates that programs have a large positive effect on the exit rate from the state of job search. When considered in the context of the estimated coefficients on other variables, the magnitude of the program effect is seemingly very large—enough to offset the disadvantage of almost 10 years of looking for work in the individual’s labour market history, or the disadvantage of having poor or no English. Taken at face value, the implication is that labour market programs are extremely effective in helping job seekers escape from job search spells into either work or by leaving the labour market. This is further investigated below by looking firstly at the effect of individual types of programs, and then separately at the impact on the rate of exit to the states of work and absent from the labour market.

Impact of participation by program type

Table 6.3 provides summary information about the duration of programs and the prior duration of the job search spell. Training programs have an average duration of around ten weeks, while wage subsidy programs and brokered employment placements last for around three months. Job search assistance programs (i.e. Job Clubs), typically last for only two to three weeks. The most commonly undertaken programs were training programs. Brokered employment placements and wage subsidy programs are particularly targeted at the most disadvantaged job seekers and the long term unemployed. However, this is not apparent from the figures in the table. For each program type, the average duration of job search prior to commencement is over one year and, surprisingly, is lowest for wage subsidy programs.

6.3 DURATION OF JOB SEARCH SPELLS, TYPE OF PROGRAM

<i>Program type</i>	<i>Number of spells of program participation</i>	<i>Completed spells of job search containing a LMP</i>	<i>Average job search duration prior to LMP (weeks)</i>	<i>Average duration of program(a) (weeks)</i>	<i>Average total duration(a) of job search spell (weeks)</i>
Training	1 724	1 299	87	9.5	121
Wage subsidy	715	589	65	23.0	100
Brokered and other employment	675	482	108	22.8	130
Job search assistance	409	320	89	2.4	116
No program	7 210	5 922	—	—	44

(a) Censored spells excluded.

Censoring

To estimate the effects of the different types of program requires further consideration of the censoring of the job search spells. Persons may participate in multiple programs during the one spell of job search. For example, soon after becoming unemployed a person may receive assistance in job search skills. Then, after remaining unemployed for a lengthy period, may progress to a subsidised job placement. Conceivably, transition out of unemployment may be attributable to either program or a combination of the two. (Appendix B contains information on the extent of multiple program participation during job search spells).

To explain how this problem was handled, assume an individual has participated in two types of programs in the one job search spell. Let i denote the first and j the second. In estimating the effect of type j programs the prior participation in type i was ignored. This could be justified by deeming the first type to have been ineffective since it was followed by further program participation. On the other hand, when estimating the effect of type i program the job search spell was censored if it was followed by participation in a type j program. In this case the outcome of type i program is not known—it could not be observed because of the further intervention. Consider again the estimation of the effect of type i programs. The above explains how censoring was handled for spells which do contain a period of participation in a type i program. However, there are a further set of spells for which censoring needs to be considered—those job search spells which do not contain participation in a type i program, or the “comparison spells”. These may contain episodes of participation in any of the other three program types. If so, these spells were censored at the first point at which participation in any other type of program occurs. Hence, the comparison is being made between spells in which participation in a particular type of program occurs and spells of unassisted job search.

Estimated effects

In each of the models estimating the effects of individual programs, the magnitude and sign of the estimated coefficients on the other co-variables are similar to those reported in table 6.2 above. Reporting of the full results is therefore left to Appendix C. Our main interest is in the estimated coefficients on the program participation variable. These are summarised in table 6.4 below. Wage subsidy programs are found to have the greatest impact on the out-of-job search hazard followed by brokered employment programs. Training programs and job search assistance have the lowest, but still a very sizeable effect on the out-of-job search hazard.

6.4 SUMMARY OF ESTIMATED EFFECTS OF PROGRAM PARTICIPATION ON THE OUT-OF-JOB SEARCH HAZARD, SINGLE RISK SPECIFICATION

<i>Any program</i>	<i>Training</i>	<i>Wage Subsidy (Jobstart)</i>	<i>Brokered and other Emp.</i>	<i>Job clubs</i>
-1.58	-1.55	-2.72	-2.32	-1.58

All estimates significant at 1% level

COMPETING RISK SPECIFICATION

To this point we have modelled the impact of participation on the hazard out of the job search state irrespective of whether the spell was terminated by the person gaining a job or dropping out of the labour market. However, the estimates already discussed, theoretical considerations and previous empirical evidence all suggest that the effect of individual characteristics and program participation may differ according to the destination of exits (Carling, et. al. 1996). Thus there is a strong case for a competing risk specification of the job search hazard—separate estimation of the conditional probability of exiting job search to work and to absent from the labour market, respectively. Under the assumption of independent risks this is done by treating exits to the other state as censored observations. When estimating the job search-to-work hazard, exits to the absent state are treated as censored spells. Similarly, when estimating the job search-to-absent hazard, exits to work are treated as censored spells.

Personal characteristics

Hazard models are estimated again for participation in any program and for each of the four program types separately. Full results are contained in tables C2 and C3 of Appendix C, and the estimated program effects summarised in table 6.5. Generally, the estimated effects of individual characteristics are similar for the out-of-job search hazard and the job search-to-work hazard. However, there are some important differences which cast further light on the results of the single risk models. The weakly significant gender effect is revealed to reflect opposing effects in specific risk models—being male is associated with a higher escape rate from job search to work, but a markedly lower escape rate from job search to absent; consistent with a greater tendency for females to escape from unemployment via departure from the labour market. The detrimental effect of age on the hazard rate is predominately due to a lower escape rate into work, and this more than offsets a higher job search-to-absent escape rate observed for persons aged 55–59.

The detrimental effect of language difficulties on the hazard out of the job search state can be attributed specifically to a lower likelihood of moving into work. While the effect of “having a disability that impedes employment” was to increase the hazard out of job search, the competing risk specification confirms that this is a result of an increased exit rate out of the labour market outweighing a significantly lower exit rate to work. Finally, the effect of “looking for part-time work only” in

reducing the escape rate from job search becomes significant in the conditional hazard models, associated with a lower escape rate to work and a higher rate of departure from the labour market.

Program participation

A comparison of tables 6.5 and 6.4 shows that the estimated effects of program participation are similar on both the out-of-job search hazard and the specific job search-to-work hazard. It is perhaps surprising that participation in a labour market program increases both the job search-to-work hazard and the job search-to-absent hazard. Generally, the job search-to-work effect does at least dominate, indicating that this is the principal effect of programs. The exception is training programs, for which the estimated coefficients suggest that participation has just as large an impact on the chance of finding work as it does on the chance of dropping out of the labour force.

6.5 SUMMARY OF ESTIMATED EFFECTS OF PROGRAM PARTICIPATION ON THE JOB SEARCH HAZARD, COMPETING RISKS SPECIFICATION

<i>Destination</i>	<i>All programs</i>	<i>Training</i>	<i>Wage subsidy</i>	<i>Brokered employment</i>	<i>Job clubs</i>
Work	-1.72	-1.56	-3.05	-2.51	-1.78
Absent from the labour market	-1.21	-1.51	-1.11	-1.77	-0.94

Note: All estimates significant at 1% level.

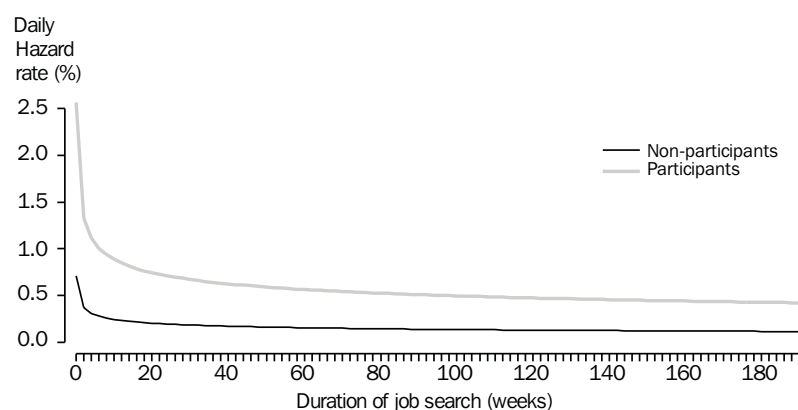
The medians of the estimated distributions for the job search-to-work hazards are in the vicinity of 400 days. This suggests that the median duration of a job search spell, given that the job seeker does not leave the labour force, is a little over one year. The median for the job search-to-absent hazard is far higher. It is estimated that, given a person in job search does not eventually find work, they will continue looking for work for a median duration of around five and a half years before dropping out of the labour market.

INTERPRETATION

To see the implications of the effect of program participation, the job search-to-work hazard of participants and non-participants are compared in figure 6.6. These are based on the model for the effect of participation in any type of program (column 1, table C2). The hazard functions are calculated for a typical individual who has an expected duration of a spell of job search equal to the median of the distribution (342 days). It can be seen from figure 6.6 that the participant hazard is substantially above that for non-participants—the chance of a participant leaving the job search state is about twice that of a non-participant for any elapsed duration. Assume that prior to the completion of a program an individual’s hazard is described by the non-participant hazard, and

that upon exiting a program the individual moves from the non-participant to participant hazard. By transposing the participant hazard from the typical exit time from a program of around 90 weeks (630 days) back to time zero, it can be seen that for a person who has just completed a program the chance of leaving a job search spell for work is about the same as for that of a new entrant into a job search spell. In other words, the estimated impact of program participation is so large as to reset the job search duration clock to zero.

FIGURE 6.6 EFFECT OF PROGRAM PARTICIPATION ON JOB SEARCH TO WORK HAZARD



This confirms what was evident from the relative size of the coefficients on program participation and other variables—that the estimated effect of program participation on the exit rate out of job search is so large as to suggest it may overstate the true impact. As foreshadowed, one likely cause of this is selection bias and this is further investigated in section 8. There is a considerable body of literature to demonstrate that the process by which persons are selected into programs can lead to an over-estimation of the average impact of the program for the wider population of the unemployed (see Heckman and Smith 1998, LaLonde 1986).

However, selection bias is not the only possible source of an over-estimation of the true effect. Conceivably, there are a number of factors arising out of the sample, data construction or modelling process that may lead to a correlation between program participation and a positive reported employment outcome for reasons other than the actual impact of the program. In Appendix D, several potential sources of bias are examined, and although we find that some do have an incremental effect, none alter the basic result that the estimated effect of programs is to greatly increase the exit rate from job search.

SECTION 7

THE HAZARD OUT OF WORKING

This section describes the effect of labour market program participation on the duration of the job that follows a job search spell. The pertinence of these estimates is to address the question of whether or not the jobs that are gained by program participants are disproportionately short-term jobs. The same set of regressors are used as in the estimation of the out-of-job search hazards. It should be noted that the final five variables in table C4—whether looking for full or part-time work, whether willing to move interstate for work, and whether received income support/unemployment related income support—relate to the prior episode of job search. The analysis is restricted to working spells that were preceded by a job search spell. These jobs tend to be of a relatively short duration. The median duration is estimated to be only 161 days, considerably shorter than for all working spells.

CHARACTERISTICS AFFECTING JOB DURATION

The full results are reported in table C4, and we draw attention to the effect of the major personal characteristics and of program participation.

Personal characteristics

Most individual characteristics have a smaller effect on the out-of-work hazard than on the job search hazard. However, as these coefficients reflect a mixture of reduced form and structural effects it is not obvious how the estimates should be interpreted.¹ Older age decreases the job search hazard and increases the work hazard. This is consistent with a reduced form effect of old age on the work hazard—a longer duration of job search shortens the subsequent work spell—but is equally as likely to reflect a structural or direct effect in which older persons have shorter working spells irrespective of their previous labour market states. On the other hand, low level of English proficiency decreases both the job search and work hazard. These results are not consistent with a reduced form effect in which low English proficiency would increase the duration of the job search spell and in turn decrease the duration of the subsequent working spell. That is unless this reduced form effect is outweighed by a very large and negative direct effect in which a low level of English proficiency reduces the work hazard (increases the duration of the subsequent working spell).

1 The arguments developed in section 5 imply that the duration of a re-employment spell depends on the prior completed duration of unemployment. Since this variable is not included in the estimated model for the reasons given, but the characteristics which affect the completed duration of unemployment are, these characteristics can be said to have a reduced form, or indirect, effect on re-employment duration. The term reduced form is a standard econometric term used to denote a model in which some endogenous variables have been substituted out. At the same time, a particular characteristic can also have a direct effect on re-employment duration in which case it is referred to as a structural effect.

The effect of program participation is summarised in table 7.1. In all cases the estimated coefficient is positive, indicating that participation decreases the work hazard (increases the duration of the subsequent working spell), though the effect is only weakly significant in the case of job search assistance. The structural interpretation of this result is that program participation increases the exit rate from job search and, in turn, this shorter duration of job search decreases the work hazard, leading to a longer subsequent working spell. *Vice versa*, a longer duration of the job search spell is associated with a shorter subsequent working duration. This suggests that as the duration of unemployment increases, the negative effects (stigma, loss of human capital) outweigh the positive effect (a better match) on the following employment spell. The much weaker effect of program participation on the work hazard is consistent with this structural interpretation.

7.1 SUMMARY OF ESTIMATED EFFECTS OF PROGRAM PARTICIPATION ON THE OUT-OF-WORK HAZARD

	<i>All programs</i>	<i>Training</i>	<i>Wage subsidy</i>	<i>Brokered and other employment</i>	<i>Job clubs</i>
Estimated coefficient	0.56***	0.39***	0.66***	0.57***	0.20*

*** significant at 1% level. * significant at 10% level.

SECTION 8

SELECTION BIAS AND COMPARISON WITH PREVIOUS EVIDENCE

The results of the duration analysis raise two immediate issues in need of further investigation. First, how important is selection bias in influencing the apparent result that program participation has a very large and positive estimated effect on the exit rate from looking to work? Second, as we will see below, the relative impacts between the different types of programs as estimated from the hazard modelling are very different to those derived from DEETYA's own evaluations at the time. Since selection issues may also be a factor in this discrepancy, it is convenient to address both the issue of selection bias and the reconciliation of the two approaches in this chapter.

This section proceeds as follows. First, after discussing the outcome measures derived from departmental "post program monitoring" surveys, it is shown that equivalent measures can be derived from the labour market state variables contained in SEUP. A control group approach is developed to estimate the impact of program participation on an individual's likelihood of entering unsubsidised work, broadly similar to that used in DEETYA's study of the net impact of program participation. We then progress to logistic regression models (or transition models) to produce comparable estimates to the control group approach. This permits us to observe changes in the estimated effect of program participation as additional covariates (controls for individual characteristics) and controls for the process of selection into programs are incorporated into the logistic regression model.

POST PROGRAM MONITORING

The major source of information on the effectiveness of labour market programs in Australia has been the post program monitoring (PPM) surveys conducted by DEETYA. These are postal surveys sent to participants from each program, enquiring as to the participant's labour market state, including their labour force status and whether or not they were involved in education and training or further intervention. Initially participants were surveyed around 3 months after the completion of a program, though later six and twelve month surveys were implemented¹. Table 8.1 collates various PPM survey results reported over the period in which SEUP was conducted.

¹ This analysis only includes 3 month PPM results as results from later surveys were not available from SEUP.

8.1

DEETYA ANALYSIS OF 3 MONTH PPM OUTCOMES

Program type/Program	Proportion in unsubsidised employment, education or training		Proportion in unsubsidised employment	
	1994-95 Annual Report(a)	1995-96 Annual Report(b)	1996-97 Annual Report(c)	1996 (EMB 2/97)(d)
	%	%	%	%
Wage subsidy				
Jobstart	58.7	59.1	63.5	50
Brokered and other employment				
Jobskills	45.9	40.5	35.4	30
New work opportunities	22.9	21
LEAP	40.0	32.0	33.2	..
Training				
Skillshare	45.4	33.9	41.0	30
Jobtrain	41.0	31.2	(e)44.8	31
Special intervention	40.5	20.4
Job search assistance				
Job clubs	45.8	37.7

(a) Based on known outcomes for completions in the 12 months ended March 1995.

(b) Based on known outcomes for completions between April and June 1994.

(c) Based on known outcomes for completions in the 12 months ended March 1997.

(d) Based on outcomes for completions in the month of February 1996.

(e) Includes some Accredited Training for Youth, which ceased in October 1996.

Source: DEETYA 1997, tables 2.1.1 to 2.4.2.

The "net impact" of programs

In their 1996 evaluation, reported in *The net impact of labour market programmes*, DEETYA constructed and surveyed control groups of persons who had not participated in any form of labour market intervention. The control groups were drawn from the DSS register of persons receiving unemployment benefits. The participants and control groups were matched on the basis of age (in 5 year groupings), sex, and duration of unemployment (in 2 month groupings). The net impact of programs was taken to be the difference in outcomes for the participant and control groups. That is, the proportion of persons with positive outcomes from the control group is used as an estimate of deadweight loss among program participants. The results are replicated in table 8.2.

8.2

DEETYA ANALYSIS OF THE NET IMPACT OF PROGRAMS, 1996

<i>Program type/Program</i>	<i>Proportion in unsubsidised employment</i>		
	<i>Non-participants</i>	<i>Participants</i>	<i>Net impact</i>
		<i>%</i>	<i>%</i>
Wage subsidy			
Jobstart	22	50	+28
Brokered and other employment			
Jobskills	19	30	+11
New work opportunities	17	21	+4
Training			
Skillshare	23	30	+7
Jobtrain	24	31	+7
Job search assistance			
Job clubs	24	36	+12

Source: DEETYA 1997, tables 2.1.1 to 2.4.2.

Since this measure considers the proportion in employment only, the results compare most closely to our estimates above of the impact of participation on the job search-to-work hazard in table 6.5. The results of the two approaches are consistent in that the wage subsidy program, Jobstart, has the largest effect while training programs and Job Clubs have a much smaller estimated impact. The large discrepancy, however, is with brokered and other employment programs. The PPM evaluation found New Work Opportunities to be very ineffective. Jobskills placements were found to be more effective, but the impact was still far less than that estimated for wage subsidy programs. In contrast, the results from estimating the job search-to-work hazard rate suggest that brokered programs have a similar impact to that of Jobstart, and a significantly larger impact than either training programs or Job Clubs.

The results of the PPM evaluations have had an important influence on the allocation of program funds for assistance to the unemployed. In 1996, a number of brokered employment programs targeted at the most difficult to place job seekers were abolished in favour of the Jobstart wage subsidy program on the grounds of these results. The PPM surveys continue to be used in monitoring the performance of contracted providers in the competitive employment services market, the Job Network. Resolving these discrepancies is therefore of considerable importance.

SEUP AND POST PROGRAM OUTCOMES

Post program monitoring outcomes

For each episode of LMP participation, the matched DEETYA administrative data in SEUP contains the post-program monitoring outcome as measured by the PPM surveys. The administrative coding for the 3 month PPM outcome variable includes the categories of: in unsubsidised employment, unemployed, not in the labour force and in

further assistance. Appendix table E1 reports percentages for each of these categories by program over the three waves of SEUP². Here we focus on the proportion in unsubsidised employment three months after completion as the principal indicator of the success rate of a program. This is shown in the first column of table 8.3.

Note, however, that DEETYA's evaluations excluded those in further assistance from the denominator in calculating the proportions in unsubsidised employment. Proportions calculated on this basis are also presented in table 8.3. Comparing these to the last three columns in table 8.1, it can be seen that the PPM outcomes by program from the SEUP sample are broadly comparable with those from the wider PPM surveys over the period in terms of the ranking of programs—JobStart achieves the highest proportion of positive outcomes, and all others a considerably lower proportion.

8.3

ALTERNATIVE MEASURES OF 3 MONTH PROGRAM OUTCOMES, SEP 1994–SEP 1997

Program type/Program	SEUP-PPM outcomes			Reported labour market activity		
	In unsubsidised employment	In unsubsidised employment—adjusted(a)	Total episodes(b)	In unsubsidised employment	In unsubsidised employment—adjusted(a)	Total episodes
	%	%	no.	%	%	no.
Wage subsidy						
Jobstart	38.4	44.5	318	51.0	55.2	787
Brokered and other employment						
Jobskills	26.2	30.4	210	34.3	38.4	289
New work opportunities	20.1	25.3	1 947	24.1	27.5	249
LEAP	20.7	24.0	58	26.4	29.1	87
Training						
Skillshare	20.7	29.1	1 000	23.3	31.3	1 294
Jobtrain	15.5	26.6	575	23.7	31.3	717
Special intervention	9.4	18.0	663	16.7	23.8	844
Job search assistance						
Job clubs	15.9	27.6	377	24.7	33.4	469

(a) Adjusted by removing those in further assistance from the denominator.

(b) Only includes episodes for which PPM outcomes are known. Reported labour market activity is known for all episodes.

2 The analysis here is restricted to episodes of program participation that ended at least three months prior to the end date of the survey.

Comparable measures of program outcomes can be derived from the SEUP respondents' reported labour market states exactly 3 months after the completion date of a program episode. In this case, outcomes are known for all episodes of program participation. Four outcome variables are derived to be comparable to the PPM outcome categories:

- in unsubsidised work—the participant was working and not in a program on the reference date (3 months from the completion date of the program);
- looking for work—the participant was looking for work and neither working nor on a program at the reference date;
- In further assistance—the participant was on any form of program at the reference date;
- absent from the labour market—the participant is neither working, looking for work nor on a program at the reference date.

The proportion in unsubsidised work as derived from respondents' reported labour market activity is also shown in table 8.3. Again a proportion in unsubsidised work is calculated omitting those in further assistance from the denominator as a comparison to DEETYA's evaluations.

Comparison of outcomes

The measure based on reported labour market activity generates a higher proportion of positive outcomes for all programs, possibly due to a response bias in which those who gain work are less likely to be contactable or less likely to return their PPM survey forms. Further deviation may be expected since PPM surveys will not be completed exactly three months after completion of the program. A more complete discussion of the degree of concordance between the program outcome measures as derived from the PPM variable and the reported labour market activity is given in Appendix E.

The relative ordering of programs is quite consistent. As with the PPM results, the wage subsidy program returns the best outcomes. Brokered employment programs have a success rate around 60 per cent of the wage subsidy program, but achieve slightly superior results to training and job search assistance programs. In this sense, the outcome variables derived from the SEUP sample broadly concur with other evaluations taken over this time period.

CONTROL GROUP

As expected, the analysis above (and in Appendix E) shows that reported labour market activity from SEUP and the post program monitoring surveys offer broadly consistent measures of the outcomes of labour market programs, as should be the case. In this section the reported labour market activity measures are further used to construct outcomes for a control group of looking for work spells, and to derive estimates of the “net impact” of program participation analogous to those contained in table 8.2. The later sections use logistic regression models to show the impact on these results when additional factors are controlled for.

The three year reference period is split into 5 sub-periods for the purpose of establishing “participant” and “control” groups of spells. The first two years are split into four six monthly periods (periods 1 to 4). Period 5 is comprised of the first nine months of the third year (the final three months cannot be included as the reference date for the outcome measure is taken three months after completion). In each period we take every completed episode of program participation, which by definition occurs during a looking for work spell, and generate an outcome variable indicating whether or not the participant was in unsubsidised work exactly three months from the date of completion of the program. The control group of episodes is comprised of a “snapshot” of all looking for work spells in progress at the midpoint of the period, and in which no episode of program participation has occurred. The outcome variable for the control group is whether or not the person is in unsubsidised work precisely 3 months on from the midpoint of the period.

The proportion in unsubsidised work is calculated for the participant and control groups within 64 sub-groups; defined by gender, by age (15–19, 20–24, 25–44 and 45–59 years) and by duration of the “looking for work” spell (0 to 3 months, 3 to 6 months, 6 to 9 months, 9 to 12 months, 12 to 18 months, 18 to 24 months, 24 to 36 months and over 36 months). To make the two groups more comparable, in calculating the proportion of people in unsubsidised work for each subgroup the control group is first weighted according to their prevalence in the participant group. The proportion in unsubsidised work for the control group as a whole is then the total of these weighted proportions. The available sample sizes preclude closer matching of the groups’ characteristics by age and duration.

The results are shown in table 8.4. In each period, the proportion of positive outcomes for the control group is calculated from the same set of spells for all four of the program types, but the result varies because of the different weightings given to the sub-groups. Generally, the control group outcome for brokered programs is the lowest, reflecting a greater proportion of brokered program participants in harder-to-place sub-groups (principally longer durations), and hence a higher weighting to these groups’ outcomes in calculating the weighted total for the control group. The effect of the weightings for the control groups is

most apparent in period five. The estimated proportion in unsubsidised work varies from as high as 16.6% when the weights reflect the characteristics of the Job Search Assistance client group, down to 11.8% when weights reflect the characteristics of the Brokered Employment program participants.

8.4 NET IMPACT OF PROGRAM PARTICIPATION—BASED ON SEUP OUTCOMES

<i>Program type/Program</i>	<i>Proportion in unsubsidised work (%)</i>				
	<i>Period 1</i>	<i>Period 2</i>	<i>Period 3</i>	<i>Period 4</i>	<i>Period 5</i>
Training					
Participants	10.1	18.3	18.6	17.3	17.5
Control group	6.4	17.0	15.7	13.7	16.1
Net impact	3.7	1.3	2.9	3.6	1.4
Wage subsidy					
Participants	19.3	18.0	52.3	56.6	60.1
Control group	7.5	18.2	14.0	13.8	15.8
Net impact	11.8	-0.3	38.3	42.8	44.3
Brokered and other employment					
Participants	17.4	29.5	29.7	26.0	30.8
Control group	8.9	15.9	14.4	12.3	11.8
Net impact	8.5	13.6	15.3	13.7	19.0
Job search assistance					
Participants	15.5	21.2	19.5	22.1	24.5
Control group	6.7	19.8	15.1	14.3	16.6
Net impact	8.7	1.4	4.5	7.7	8.0

With this allowance for “deadweight loss”, the experiment confirms previous findings that training programs have a negligible impact, and job search training also has a small positive impact on the likelihood of the participant gaining work. For brokered employment programs, from 10–20% more of the participants were found to be in unsubsidised work compared to the control group. Over the full five periods, participants in wage subsidy programs were far more likely to gain work than non-participants, though the effect is much smaller in the first 12 months of the survey period.

TRANSITION ANALYSIS

As previously discussed there are two major limitations of the control group method: potential selection bias and the ability to control for only a limited set of individual characteristics. To remedy both of these limitations a parametric analysis is essential.

To derive a specific parametric form it is convenient to introduce an underlying latent variable Y^* that can be thought of as the tendency to be in unsubsidised work. More formally, Y^* is a linear function of observable individual characteristics X that affect the employment outcome, whether an individual participated in a program or not (P) and a set of unobservable characteristics ϵ .

TRANSITION ANALYSIS

continued

$$(4) \quad Y^*_i = \beta X_i + \gamma P_i + \varepsilon$$

The latent variable Y^* is not observed as such. What is observed is whether an individual is in unsubsidised work or not. The observable outcome, denoted Y , is a variable that takes the value one if the individual is in work and zero otherwise. To relate this to the underlying latent variable it is assumed that $Y=1$ if $Y^*>0$ in which case the likelihood of a positive employment outcome can be represented as

$$(5) \quad \text{Prob}(Y=1) = \phi(\beta X_i + \gamma P_i)$$

In the first instance it will be assumed that $\phi(\beta X_i + \gamma P_i)$ represents the logistic distribution function which leads to the logistic regression model or logit. Alternatively, if the distribution is taken to be the standard normal we get a probit model. This alternative formulation is used later in this chapter to correct for any selection effect.

Model with limited explanatory variables

The logistic regression is estimated for the same five periods and sets of spells as used in the control group analysis. In each period all looking for work spells containing a completed episode of program participation are included. The reference date for the outcome variables is three months from the end date of the program. The “non-participation” spells are the snapshot of all looking for work spells occurring at the midpoint of the period and for which no episode of program participation occurs during the period. The reference date for the outcome variable is three months on from the midpoint.

Initially only the variables used in the control group comparison are included in the logit models. The only difference compared to the control group analysis is that the estimates of the net program effect, as represented by the parameter γ , are now based on an explicit parametric representation of the relationship between program participation and outcome. The estimated coefficients and their significance levels are recorded in table 8.5. The models consistently show that the likelihood of being in unsubsidised work at the reference date is lower for persons over 45 and for those who have been in looking-for-work spells of longer duration. With respect to the effects of program participation, completing a training or job search assistance program generally has no significant impact on the chance of being in unsubsidised work 3 months later, with the exception of a small and negative estimated effect in the second period. Despite some negative results in the models for the first two periods, the estimated impact of wage subsidy and brokered and other employment programs is positive and highly significant in most periods, with wage subsidy programs having the highest estimated effect.

8.5

LOGISTIC ANALYSIS OF THE PROBABILITY OF BEING IN UNSUBSIDISED WORK

Variable	Co-efficient				
	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-1.996 ***	-0.421 ***	-1.002 ***	-1.286 ***	-0.387 **
Program type					
Training	-0.259	-0.504 ***	-0.074	0.058	0.055
Wage subsidy	0.104	-1.112 ***	1.179 ***	1.881 ***	2.210 ***
Brokered and other employment	-1.347 ***	-0.399 *	0.483 **	0.629 ***	1.069 ***
Job search assistance	0.165	-0.448 *	-0.178	0.232	0.502
Male	0.153	0.045	0.052	0.039	-0.375 ***
Age 15–19	0.071	-0.023	0.057	0.253	-0.034
Age 20–24	0.146	0.137	-0.030	0.128	-0.030
Age 45–59	-0.478 **	-0.370 ***	-0.497 ***	-0.330 *	-0.441 **
Duration	-0.069 **	-0.181 ***	-0.095 ***	-0.085 ***	-0.200 ***
Chi-squared	36.2 ***	187.6 ***	85.8 ***	125.9 ***	172.4 ***
Degrees of freedom	9	9	9	9	9
Individual spells	2 829	3 194	2 275	1 768	1 408
With program participation					
Training	843	855	657	407	230
Wage subsidy	182	162	166	148	139
Brokered and other employment programs	149	168	194	212	143
Job search assistance	150	132	104	79	54

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

So the pattern of findings concurs with those obtained through the control group approach (table 8.4). To aid interpretation of the results, a more direct comparison can be drawn by using the results of the regression models to calculate the predicted probability of a person being in unsubsidised work conditional on given values of the explanatory variables. In table 8.6, the base case represents the predicted probability of being in work for a person who has not participated in any program (P=0) and with all other variables set at their sample means. The probability of being in work is then calculated separately for that person assuming they have participated in a program (P=1). It can be seen that the predicted probability of being in unsubsidised work for non-participants ranges from 9.1% to 23.4%. It reaches as high as 63.5% for wage subsidy program participants in Period 5.

8.6

LOGISTIC ANALYSIS OF THE NET IMPACT OF PROGRAM PARTICIPATION

Program type	Predicted probability of being in unsubsidised work (%)				
	Period 1	Period 2	Period 3	Period 4	Period 5
Training					
Participants	7.2	15.6	16.6	16.2	16.8
Control Group	9.1	23.4	17.7	15.5	16.0
Net impact	-1.9	-7.8	-1.1	0.8	0.8
Wage subsidy					
Participants	10.0	9.2	41.1	54.6	63.5
Control Group	9.1	23.4	17.7	15.5	16.0
Net impact	0.9	-14.3	23.4	39.1	47.5
Brokered and other employment					
Participants	2.6	17.1	25.8	25.6	35.7
Control Group	9.1	23.4	17.7	15.5	16.0
Net impact	-6.6	-6.4	8.1	10.1	19.7
Job search assistance					
Participants	10.6	16.4	15.2	18.7	24.0
Control Group	9.1	23.4	17.7	15.5	16.0
Net impact	1.5	-7.1	-2.5	3.3	8.0

Controlling for additional individual characteristics

A major shortcoming of the control group approach is that a very limited number of variables are used to control for the differences between the participant and non-participant groups—only gender, age and duration of the looking for work spell. Having shown that results from a control group approach can be closely replicated using logistic regression, it is now a simple matter of adding additional independent variables into the regression models to illustrate the effect this has on the estimates of the impact of program participation.

The models for each period are expanded to include the full set of explanatory variables that were included in the hazard models of section 6. The original regression estimates are reported in table F1 of the appendices. Our interest here is only in the program participation variables. For ease of interpretation, these are again presented in the form of their impact on the predicted probability of the person being in unsubsidised work at the reference date (table 8.7). It can be seen that, even with an extensive range of control variables, the story is essentially unchanged from that presented in table 8.6. Although some variation occurs across the time periods, generally wage subsidy programs have a large positive effect on the likelihood of moving into work, brokered and other employment programs show a more modest positive effect, and training and job search assistance have very little effect or even a small negative effect.

8.7

EXPANDED LOGISTIC ANALYSIS OF THE NET EFFECT OF PROGRAM PARTICIPATION

Program type	Predicted probability of being in unsubsidised work (%)				
	Period 1	Period 2	Period 3	Period 4	Period 5
Training					
Participants	4.8	14.4	14.5	14.7	15.0
Control group	8.2	20.1	15.0	14.3	14.1
Net impact	-3.4	-5.7	-0.5	0.4	1.0
Wage subsidy					
Participants	6.7	6.9	29.7	45.2	61.9
Control group	8.2	20.1	15.0	14.3	14.1
Net impact	-1.4	-13.1	14.7	30.9	47.8
Brokered and other employment					
Participants	2.4	13.1	20.4	20.9	34.2
Control group	8.2	20.1	15.0	14.3	14.1
Net impact	-5.7	-7.0	5.4	6.6	20.1
Job search assistance					
Participants	6.3	13.5	14.1	16.7	22.7
Control group	8.2	20.1	15.0	14.3	14.1
Net impact	-1.8	-6.6	-0.9	2.4	8.6

SELECTION EFFECTS

The possibility that the estimated impact of program participation may be spurious due to “selection bias”, i.e. a failure to take account of the process by which persons are selected into programs, was introduced in section 3. To explain how to overcome this problem we define a latent variable P^* that represents the tendency to participate in a program. Like the tendency to be employed, the tendency to being a participant is assumed to be a function of a set of observable individual characteristics Z and unobservable characteristics v .

$$(6) \quad P^*_i = \eta Z'_i + v_i.$$

Whether a person participates or not is represented by P taking the value one for a participant and zero otherwise. With reference to the latent variable, $P=1$ if $P^*>0$ and thus the likelihood of participation can be expressed as

$$(7) \quad \text{Prob}(P=1) = \phi(\beta Z_i).$$

Estimating the net program effect from equation (5) would result in biased estimates if the unobservable variables ε and v are correlated. In particular, persons for whom v takes a positive value are more likely to be selected into a program but those persons are also likely to have positive values of ε and thus a more favourable outcome.

To take account of this possibility we used the standard procedure developed by Heckman (1979). This method is a two step procedure. In the first step the probability of being a participant is estimated (equation 7 above). From these estimates a correction term is derived and this correction term then becomes an additional variable in the employment outcome model (equation 5). In implementing this method, $\phi(\beta Z_i)$ was

SELECTION EFFECTS

continued

taken to be the standard normal distribution. i.e. both the selection and outcome models were probits. The Heckman two step method yields consistent estimates if the outcome model is a linear regression model. In this case, however, the outcome model is not linear but a probit. As shown by O'Higgins (1994) the consistency property does not carry over to this case. Instead, consistent estimates can be obtained from a switching bivariate probit model but time constraints prevented the implementation of this method for the purposes of this paper.

Program participation

In total, twenty two-step selection models are estimated (5 periods by 4 program types). In the interests of brevity, we do not report the results of the first stage regressions for selection into programs. Rather, for the readers' information we have separately run models for the likelihood of participating in each program type for data pooled over the five periods. This is sufficient to show the major factors determining the likelihood of a looking for work spell containing a program episode. The results of these models are reported in Appendix table G1, and briefly summarised here.

As would be expected, if the individual was recruited into the known labour market participant sub-sample, looking for work spells were far more likely to contain an episode of program participation. Duration of unemployment and being in receipt of unemployment related benefits are two of the main eligibility criteria used for program participation. Accordingly the coefficients on these variables are highly significant and have the anticipated signs.

Poorer levels of English proficiency greatly reduce the likelihood that an individual will participate in a wage subsidy, brokered employment or job search assistance program. Motivation also appears to play a role. Being willing to move interstate for work, which we interpret as indicating higher commitment to finding employment, increases the likelihood of participating in a program. The negative coefficients on having a spouse who works full-time and looking only for part-time work are consistent with disincentive effects. There is some tentative evidence, then, that more motivated and capable persons do find their way into labour market programs ahead of others given the main eligibility criteria are met.

Excluded variables

As discussed, the estimation with controls for selectivity involves a two-step regression which first estimates the program participation equation and then the outcome equation in a total of 20 separate conditional models. That is, for each period and program type the model is estimated across the sample of spells containing an episode of participation in that program type plus the comparison spells. In estimating the participation equation for each program type, variables which attained only very low levels of significance in all periods have been dropped.

Identifying the effect of program participation requires that at least one independent variable in the participation model is excluded from the outcome equation. On the basis of their low levels of significance in the outcome equations, the excluded variables are “has disability” for the training program models, “Age 20 to 24” for the wage subsidy models “speaks English fairly well” for brokered and other employment programs and “looking for full-time work only” for job search assistance.

SELECTION MODEL RESULTS

Full results for the second-step (outcome) equations are contained in Appendix tables G2 through to G5. The estimated effects of program participation variables are shown in table 8.8 in the form of their net impact on the predicted probability of being in unsubsidised work three months after program completion. The coefficient on program participation now attains significance in only a handful of models. For training and job search assistance programs, the story remains unchanged in that their estimated impact is not generally significantly different to zero, the one exception being the negative coefficient for training programs in period 4 (which is significant at the 5% level).

8.8 NET IMPACT OF PROGRAM PARTICIPATION—RESULTS FROM SELECTION MODELS

Program type	Predicted proportion in unsubsidised employment (%)				
	Period 1	Period 2	Period 3	Period 4	Period 5
Training					
Participants	8.7	31.2	0.3	0.5	24.2
Control group	6.0	14.9	0.2	32.2	12.0
Net impact	2.7	16.3	0.1	-31.7	12.2
Wage subsidy					
Participants	1.3	6.7	44.3	52.8	81.0
Control group	9.2	21.8	14.3	12.2	12.7
Net impact	-7.9	-15.0	30.0	40.6	68.3
Brokered and other employment					
Participants	1.8	29.6	14.0	0.6	24.5
Control group	7.4	20.2	15.6	22.6	14.4
Net impact	-5.6	9.5	-1.6	-22.0	10.1
Job search assistance					
Participants	0.5	9.0	20.6	2.1	33.3
Control group	9.6	22.6	14.2	13.9	13.5
Net impact	-9.2	-13.6	6.5	-11.9	19.8

For wage subsidy and brokered employment programs, the two programs previously estimated to have a sizeable net positive impact, the story changes quite dramatically with the introduction of controls for selection. First it appears that the significance of the negative results evident in the early periods in table 8.7 may be a result of negative selection effects. That is, the persons observed to be participating in labour market programs in those periods were less likely to secure unsubsidised work. This may be a result of the process of the selection of program participants onto the SEUP panel. In this case, selection bias arises as a

SELECTION MODEL RESULTS

continued

phenomenon of initial sample selection rather than a process of selection into programs within the sample and over time. The large positive effect of wage subsidy programs in the latter periods is enhanced even further, although a high level of significance is now only attained in the period 5 model. For brokered employment programs, we now find no positive effects for program participants. Only in period 4 is the estimated coefficient significant, and in that case the predicted probabilities suggest that the effect of participation is to reduce the chance of being in work from around 22 per cent to almost zero.

SUMMARY

In summary, there is no clear evidence of systematic selection bias. The effect of correcting for selection differs across programs and for the same program over the reference period. This may reflect a combination of influences in addition to the initial sample selection effect mentioned above. For example, eligibility rules or practices adhered to by program administrators may have varied, or the modest improvement in labour market conditions over the reference period may have led to a change in the characteristics of those entering programs. It should also be noted that the method employed controls only for selection on "observables", when in fact the process of selection into programs may well be related to factors that cannot be observed in the data.

A priori, we expected wage subsidy programs to exhibit the strongest signs of selection bias, since employers themselves choose from the job seekers eligible to attract a subsidy before the job seeker is considered to be on the program. If anything, the results are contrary to this expectation. We also hoped to explain the discrepancy in the finding of the hazard analysis that brokered and other employment programs have a sizeable positive effect on participants' chances of finding work, whereas DEETYA's previous evaluations found such programs to be relatively ineffective. Again this was not to be. The analysis in this section has eliminated the more limited number of controls for individual characteristics available in the DEETYA evaluation as the cause of this discrepancy, but unfortunately offers little further assistance in the interpretation of the earlier results.

SECTION 9

CONCLUSIONS

This paper has used data from the SEUP to assess the effect of participation in labour market programs on the hazard rate out of spells of job search while not working and the hazard rate out of subsequent working spells for the major types of program in Australia.

Assuming that the SEUP derived 'job search' spells can be taken as a reasonable approximation to time in unemployment, the principal result is that participation in a labour market program has a beneficial effect on both unemployment and employment duration. Program participation increases the exit rate from unemployment and decreases the exit rate from subsequent employment.

In contrast to previous evaluations of Australian labour market programs, differences in an extensive range of observable individual characteristics are taken into account and the specification of program participation is less crude than in a previous paper (Stromback, Dockery and Ying 1998). The estimated effect of participation is very large. Even a few weeks assistance in job search skills is estimated to more than compensate for a low level of education combined with disability and old age. This suggests that the results may be influenced by favourable selection into programs leading to an upward bias in the estimated impact of participation. While there are a number of other potential sources of such a bias, an assessment of those factors and previous evidence from overseas suggests that selection effects are important.

The relative effects of the different types of program are consistent with results from DEETYA's post program monitoring (PPM) surveys in that wage subsidy programs are found to be the most effective form of assistance in increasing the exit rate from unemployment to employment. However, the duration analysis suggests that brokered employment programs are markedly more effective than the PPM results imply.

In order to resolve this discrepancy, we show that DEETYA's control group approach can be closely replicated using transition models based upon labour market activity variables in SEUP, and these give broadly consistent results to departmental evaluations undertaken over the period of the survey. The use of transition models permits tests of the effect of incorporating additional explanatory variables to the basic controls used by DEETYA and a standard control for selection bias. We find that the availability of richer controls for individual characteristics would have had little effect on DEETYA's findings. Rather, the contrast between the results of the duration analysis presented here and previous evaluations would seem to reflect a more fundamental difference in the approaches to measuring program outcomes. The hazard models make fuller use of the longitudinal nature of the data, while the transition models require the arbitrary selection of a point in time as a reference for observing the outcome.

The range of explanatory variables included in the duration analysis provides considerably greater control for selection than has previously been possible in Australian evaluations, yet there is strong evidence that selection bias is still present. The elementary control for selection bias included in the transition models provided inconclusive evidence on the extent to which the results may be driven by the process of selection into programs, although the large positive effect of wage subsidy programs persists. Thus we must retain a note of caution that the estimated impact on the hazard may not be due to the effect of the treatment (the program) alone, but largely to unobserved differences in the characteristics of individuals who are selected into programs. But not all the evidence points to this conclusion. If selection is driving the results of the hazard modelling it is difficult to see why a few weeks of job search assistance should have almost as large an effect as up to six months of subsidised employment. In the latter case it is easy to imagine that selection is important, but less so in the former.

Aside from the estimation of the hazard models, an important part of this paper has been to reconcile the information with the administrative data and to correct the original looking spells for periods of working. While it is difficult to validate this process the indications are that this process has resulted in a high quality data set that can, with some confidence, be used for a more thorough evaluation of labour market programs in Australia. The analysis offers qualified support for wage subsidy programs as a highly effective form of assistance to the unemployed. However, a priority for future work should be to introduce more stringent controls for selectivity into programs than was possible for the purposes of this paper.

APPENDIX A

DESCRIPTION OF LABOUR MARKET PROGRAMS

Training	<p>JobTrain—formal training to assist job seekers who were either long term unemployed or otherwise assessed by the Commonwealth Employment Service (CES) as at high risk of becoming long term unemployed. Training places were contracted by the CES with TAFE, community based organisations, private training agencies and industry bodies. The average duration of the training was eight to ten weeks. (DEETYA 1997: 5)</p> <p>SkillShare—community based program that provided long term unemployed and other disadvantaged job seekers with skills training and employment-related assistance to gain jobs or entry into further education or training. Around 60% of SkillShare placements involved formal training courses. Other forms of assistance included access to self-help facilities and informal assistance. (DEETYA 1997: 5)</p> <p>Special intervention—provided professional assessment of barriers to employment and training and assistance to overcome those barriers to enable job seekers to make the transition into employment or training. (DEETYA 1996: 132)</p>
Brokered and Other Employment programs	<p>JobSkills—provided long term unemployed persons aged 21 and over with a combination of supervised work experience and structured on- or off-the-job training. Placements were for 26 weeks. (DEETYA 1997: 7)</p> <p>New Work Opportunities—provided funds for projects that provided work experience and training over a 26 week period and which were deemed to have a demonstrated value to the community. Targeted at very long term unemployed job seekers who had difficulty finding work because of limited employment opportunities. Around 95% of participants had been unemployed for 18 months or more. (DEETYA 1997: 7)</p> <p>Landcare and Environment Action Program—provided formal training and work experience for job seekers aged 15 to 20 years in landcare, environment, cultural heritage and conservation projects. Placements were for 26 weeks. (DEETYA 1996: 131)</p>
Job Search Assistance	<p>Job Clubs—provided job seekers with instruction in job search techniques and support from a Job Club leader and other participants. Also aimed to improve employment prospects by increasing the job seeker's self esteem, confidence and job search efforts. (DEETYA 1997:4)</p>
Wage Subsidy	<p>JobStart—provided support for long term unemployed or otherwise disadvantaged job seekers through wage subsidies paid to employers. The level and duration of the subsidy varied with the job seeker's level of disadvantage as indicated by their age, educational attainment and length of unemployment. (DEETYA 1997: 3)</p>

APPENDIX B

ADJUSTMENT OF WORKING AND LOOKING-FOR-WORK SPELLS

Table B1 gives the number of different types of spells in the original SEUP episode data and the adjusted data. There are only marginal differences between the number of working, looking-for-work and absent spells. However, the count of program spells in the adjusted data is much lower than in the original data. About 12% of the program spells were 'lost' as they occurred during a working or absent spell and had no associated looking-for-work spell, even after allowing for some degree of mismatch between the administrative and survey data. This proportion does not differ much according to type of program.

B1 NUMBER OF DIFFERENT TYPES OF SPELLS BEFORE AND AFTER ADJUSTMENT OF THE DATA

	<i>Original data</i>	<i>Adjusted data</i>
TYPE OF LABOUR MARKET SPELL		
Working	13 541	12 588
Looking (job search)	8 885	9 447
Absent	5 120	4 906
LABOUR MARKET PROGRAMS		
Any Program	5 282	4 639
Training	3 122	2 712
Wage Subsidy	878	771
Brokered and other Employment	787	713
Job Clubs	495	443

Table B2 shows the incidence of multiple episodes of program participation within job search spells. This incidence is highest for 'any program' implying, for example, that a period on the Job Club program may well be followed by participation in a training or wage subsidy program. For particular types of programs the incidence of multiple spells is, of course, much lower. Thus, having been on a wage subsidy program, few individuals are given another place on a wage subsidy program during the same job search spell. It is possible the reported incidence of these multiple spells are not true multiple spells, but a result of interruptions for personal reasons or persons being moved from one employer to another during a placement.

B2

INCIDENCE OF MULTIPLE SPELLS OF PROGRAM PARTICIPATION

<i>Number of program spells within a single job search spell</i>	<i>Any program</i>	<i>Training</i>	<i>Wage subsidy</i>	<i>Brokered and other employment</i>	<i>Job clubs</i>
1 only	1 475	1 117	662	640	383
Multiple spells					
2 spells	623	366	51	33	22
3 spells	295	156	3	1	2
4 spells	143	57	0	1	1
5 spells	48	16	0	0	1
6-10 spells	32	12	0	0	0
Total (counting multiple spells as one spell)	2 616	1 724	715	675	409

In the duration analysis only the first spell of program participation of a particular type is used. If this spell is followed by another program of a different type, the job search spell is treated as right censored. This means that the number of program spells that can be included in the analysis is the number given in the last row of table B2.

APPENDIX C

REGRESSION RESULTS

C1 ESTIMATED REGRESSION COEFFICIENTS FOR THE OUT-OF-JOB SEARCH HAZARD, SINGLE RISK SPECIFICATION—BY TYPE OF PROGRAM

<i>Variable</i>	<i>Training programs</i>	<i>Wage subsidy</i>	<i>Brokered employment programs</i>	<i>Job clubs</i>
Constant	6.0441 ***	5.9546 ***	5.9954 ***	6.0040 ***
Participation	-1.5489 ***	-2.7211 ***	-2.3195 ***	-1.5789 ***
Sample sub-group, PRG				
Jobseeker	0.4362 ***	0.4643 ***	0.4684 ***	0.4428 ***
Known LMP participants	1.1760 ***	1.2452 ***	1.2229 ***	1.2012 ***
Male	-0.1051 ***	-0.0898 **	-0.1017 **	-0.1045 ***
Age 15–19	0.0096	-0.0268	0.0062	-0.0253
Age 20–24	0.0145	0.0513	0.0547	0.0353
Age 25–44				
Age 44–54	0.2562 ***	0.2547 ***	0.2663 ***	0.2546 ***
Age 55–59	0.5471 ***	0.5358 ***	0.5948 ***	0.5871 ***
Birthplace				
Australia	-0.1575 *	-0.1253	-0.1541 *	-0.1512
Main English speaking country	-0.2933 ***	-0.2518 **	-0.2700 ***	-0.2976 ***
Married	-0.1326 **	-0.1639 ***	-0.1557 ***	-0.1383 **
Married with dependents	0.1926 ***	0.2183 ***	0.2255 ***	0.2360 ***
Female with child less than 3	-0.0990	-0.1214	-0.0967	-0.0941
English Proficiency				
English first Language				
Speaks English well/very well	-0.0804	0.0588	0.0688	0.1231
Speaks English fairly well	0.4455 ***	0.4400 ***	0.4760 ***	0.4635 ***
Speaks English not well/not at all	0.5336 ***	0.5751 ***	0.5881 ***	0.6154 ***
Has disability	0.1528 ***	0.1286 **	0.1488 ***	0.1471 ***
Disability impedes employment	-0.0190	0.0075	0.0185	0.0100
Socio-economic index (of CD)	-0.0246 ***	-0.0189 ***	-0.0241 ***	-0.0263 ***
Labour market history				
Experience (years working)	0.0019	0.0023	0.0013	0.0022
Years looking for work	0.1815 ***	0.1904 ***	0.1921 ***	0.1966 ***
Level of education (0 to 14)	-0.0360 ***	-0.0364 ***	-0.0395 ***	-0.0380 ***
Union member	-0.5358 ***	-0.5205 ***	-0.5327 ***	-0.5342 ***
Spouse works full-time	-0.3218 ***	-0.3228 ***	-0.3005 ***	-0.2978 ***
Looking for full-time or part-time work				
Full-time work only	0.0968 ***	0.0839 **	0.0964 ***	0.0861 **
Part-time work only	0.0329	-0.0065	-0.0169	-0.0148
Would move interstate	-0.6838 ***	-0.6969 ***	-0.6887 ***	-0.7035 ***
Received income support	0.3606 ***	0.3763 ***	0.3255 ***	0.3195 ***
Received unemployment related income support	0.2961 ***	0.3005 ***	0.3626 ***	0.3089 ***
Individual spells	9 447	9 447	9 447	9 447
Participants	1 473	576	529	380
Log likelihood	-45 240	-43 930	-43 556	-42 447
P (Weibull distribution)	0.74	0.74	0.73	0.74
Median of distribution (days)	277	302	312	324

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Variable	Any programs	Training	Wage Subsidy	Brokered and other employment	Job Clubs
Constant	6.3299 ***	6.2930 ***	6.1517 ***	6.1912 ***	6.2461 ***
Participation	-1.7176 ***	-1.5572 ***	-3.0484 ***	-2.5065 ***	-1.7752 ***
Sample sub-group, PRG					
Jobseeker	0.5580 ***	0.4808 ***	0.5044 ***	0.5064 ***	0.4839 ***
Known LMP participants	1.0321 ***	1.1568 ***	1.2524 ***	1.2228 ***	1.1970 ***
Male	-0.1885 ***	-0.2090 ***	-0.1913 ***	-0.2102 ***	-0.2123 ***
Age 15–19	0.0035	-0.0153	-0.0230	0.0244	-0.0178
Age 20–24	0.0473	-0.0028	0.0418	0.0435	0.0231
Age 25–44					
Age 44–54	0.3940 ***	0.4126 ***	0.3965 ***	0.4507 ***	0.4170 ***
Age 55–59	1.2854 ***	1.3740 ***	1.3258 ***	1.4584 ***	1.3969 ***
Birthplace					
Australia	-0.2342 ***	-0.233 **	-0.1525	-0.1824 *	-0.2138 **
Main English speaking country	-0.2790 ***	-0.3123 ***	-0.2357 **	-0.2584 **	-0.3148 ***
Married	-0.1672 ***	-0.1319 **	-0.1567 ***	-0.1508 **	-0.1219 *
Married with dependents	0.1523 ***	0.1971 ***	0.2047 ***	0.2211 ***	0.2338 ***
Female with child less than 3	-0.0720	-0.0195	-0.0567	-0.0108	-0.0197
English Proficiency					
English first Language					
Speaks English well/very well	0.1063	0.1028	0.0889	0.1098	0.1588
Speaks English fairly well	0.5889 ***	0.6929 ***	0.6644 ***	0.7389 ***	0.7102 ***
Speaks English not well/not at all	1.1904 ***	1.1006 ***	1.1684 ***	1.1981 ***	1.2186 ***
Has disability	0.1999 ***	0.1802 ***	0.1575 ***	0.1716 ***	0.1689 **
Disability impedes employment	0.1215 *	0.2112 **	0.1935 ***	0.1917 **	0.2055 ***
Socio-economic index (of CD)	-0.0244 ***	-0.0275 ***	-0.0201 ***	-0.0257 ***	-0.0288 ***
Labour market history					
Experience (years working)	-0.0045	-0.0055	-0.0051	-0.0067 *	-0.0055
Years looking for work	0.1850 ***	0.2137 ***	0.2185 ***	0.2252 ***	0.2288 ***
Level of education (0 to 14)	-0.0405 ***	-0.0473 ***	-0.0443 ***	-0.0484 ***	-0.0474 ***
Union member	-0.6572 ***	-0.7001 ***	-0.6710 ***	-0.6953 ***	-0.6912 ***
Spouse works full-time	-0.2369 ***	-0.2821 ***	-0.2735 ***	-0.2556 ***	-0.2565 ***
Looking for full-time or part-time work					
Full-time work only	-0.0184	-0.0097	-0.0102	-0.0101	-0.0221
Part-time work only	0.1382 **	0.1686 ***	0.1308 **	0.1149 *	0.1127 *
Would move interstate	-0.5035 ***	-0.4480 ***	-0.4854 ***	-0.4583 ***	-0.4861 ***
Received income support	0.5040 ***	0.5154 ***	0.5526 ***	0.4952 ***	0.4755 ***
Received unemployment related income support	0.1285 *	0.0768	0.0807	0.1348	0.0916
Individual spells					
Participants	9 447	9 447	9 447	9 447	9 447
Log likelihood	-42 880	-35 267	-34 764	-34 194	-33 291
P (Weibull distribution)	0.7	0.71	0.71	0.7	0.71
Median of distribution (days)	342	412	438	461	478

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

C3

ESTIMATED REGRESSION COEFFICIENTS FOR THE JOB SEARCH-TO-ABSENT HAZARD, COMPETING RISK SPECIFICATION—BY TYPE OF PROGRAM

Variables	Any programs		Training		Wage Subsidy		Brokered and other employment		Job clubs	
Constant	8.4202	***	8.2849	***	8.3580	***	8.4312	***	8.2875	***
Participation	-1.2090	***	-1.5125	***	-1.1116	***	-1.7731	***	-0.9366	***
Sample sub-group, PRG										
Jobseeker	0.3500	***	0.2969	***	0.3374	***	0.3434	***	0.3146	***
Known LMP participants	0.9719	***	1.1615	***	1.1906	***	1.1573	***	1.1517	***
Male	0.2388	***	0.2022	***	0.2376	***	0.2284	***	0.2267	***
Age 15–19	-0.1545		-0.1166		-0.1710		-0.1969		-0.1895	
Age 20–24	0.0208		-0.0230		-0.0089		0.0138		-0.0241	
Age 25–44										
Age 44–54	0.0438		0.0410		0.0564		-0.0235		-0.0248	
Age 55–59	-0.6453	***	-0.5696	***	-0.5748	***	-0.6163	***	-0.5351	***
Birthplace										
Australia	0.0743		0.0871		-0.0063		-0.0380		0.0499	
Main English speaking country	-0.1312		-0.1916		-0.2543		-0.2624		-0.2010	
Married	-0.1245		-0.1622	*	-0.2120	***	-0.1927	***	-0.2081	**
Married with dependents	0.1793	**	0.2172	**	0.2736	***	0.2673	***	0.2686	***
Female with child less than 3	-0.3933	***	-0.3035	***	-0.3064	**	-0.3269	***	-0.2972	**
English Proficiency										
English first language										
Speaks English well/very well	0.1086		0.0672		0.0148		-0.0061		0.0515	
Speaks English fairly well	-0.0844		-0.0536		-0.0974		-0.1162		-0.0744	
Speaks English not well/not at all	-0.1488		-0.1374		-0.2008		-0.1939		-0.1150	
Has disability	0.1234		0.0723		0.0614		0.0879		0.0781	
Disability impedes employment	-0.5922	***	-0.4842	***	-0.4682	***	-0.4725	***	-0.4665	***
Socio-economic index (of CD)	-0.0194	*	-0.0143		-0.0155		-0.0175	*	-0.0171	
Labour market history										
Experience (years working)	0.0076	*	0.0110	**	0.0122	**	0.0117	**	0.0117	**
Years looking for work	0.0925	***	0.1127	***	0.1230	***	0.1183	***	0.1246	***
Level of education (0 to 14)	-0.0104		-0.0103		-0.0185	*	-0.0202	**	-0.0169*	*
Union member	0.2469	*	0.1891		0.1916		0.1948		0.1759	
Spouse works full-time	-0.4913	***	-0.4270	***	-0.4447	***	-0.4309	***	-0.4110	***
Looking for full-time or part-time work										
Full-time work only	0.4398	***	0.4397	***	0.4266	***	0.4494	***	0.4462	***
Part-time work only	-0.2281	***	-0.2160	***	-0.2655	***	-0.2598	***	-0.2518	***
Would move interstate	-1.2980	***	-1.3293	***	-1.3222	***	-1.3427	***	-1.3288	***
Received income support	-0.0785		-0.106		-0.0629		-0.0376		-0.0596	
Received unemployment related income support	0.6166	***	0.6925	***	0.7196	***	0.787	***	0.7181	***
Individual spells										
Participants	9 447		9 447		9 447		9 447		9 447	
Log likelihood	2 378		1 473		576		529		380	
P (Weibull distribution)	-15 078		-13 150		-12 169		-12 384		-12 101	
Median of distribution (days)	0.84		0.84		0.84		0.84		0.85	
Median of distribution (days)	1 884		1 971		2 351		2 300		2 330	

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

C4

ESTIMATED REGRESSION COEFFICIENTS FOR THE OUT-OF-WORK HAZARD, BY TYPE OF PROGRAM

Variable	Any programs		Training		Wage Subsidy		Brokered and other employment		Job Clubs	
Constant	6.0338	***	6.0815	***	6.1237	***	6.1124	***	6.1392	***
Participation	0.5564	***	0.3870	***	0.6557	***	0.5734	***	0.2003	*
Sample sub-group, PRG										
Jobseeker	-0.2309	**	-0.2061	**	-0.2083	**	-0.1959	**	-0.1897	*
Known LMP participants	-0.1195		-0.0148		-0.0315		0.0461		0.0898	
Male	-0.1935	***	-0.1999	***	-0.2147	**	-0.202	***	-0.2092	***
Age 15-19	-0.1337		-0.1177		-0.1244		-0.1012		-0.1069	
Age 20-24	-0.0306		-0.0179		-0.0360		-0.0216		-0.0208	
Age 25-44										
Age 44-54	0.0325		0.0448		0.0463		0.0386		0.0355	
Age 55-59	-0.3523	**	-0.3600	**	-0.3633	**	-0.3680	**	-0.3937	***
Birthplace										
Australia	-0.1047		-0.1283		-0.1476		-0.1604		-0.1648	
Main English speaking country	-0.0431		-0.0757		-0.0820		-0.1004		-0.1106	
Married	-0.0997		-0.1005		-0.1005		-0.0894		-0.0909	
Married with dependents	0.2623	***	0.2614	***	0.2724	***	0.2523	***	0.2613	***
Female with child less than 3	-0.1220		-0.1139		-0.1067		-0.0905		-0.1079	
English Proficiency										
English first language										
Speaks English well/very well	0.2201	**	0.1960	*	0.2130	*	0.1937	*	0.1915	*
Speaks English fairly well	0.3912	***	0.3780	**	0.3971	***	0.4092	***	0.3890	***
Speaks English not well/not at all	0.4916	**	0.4404	*	0.4648	*	0.4444	*	0.4301	*
Has disability	-0.1945	***	-0.1919	***	-0.1989	***	-0.1805	**	-0.1788	**
Disability impedes employment	-0.0425		-0.0470		-0.0356		-0.0593		-0.0582	
Socio-economic index (of CD)	0.0208	***	0.0187	**	0.0184	**	0.0189	**	0.0171	**
Labour market history										
Experience (years working)	0.0081	**	0.0084	**	0.0081	**	0.0086	**	0.0085	**
Years looking for work	-0.0424	***	-0.0385	***	-0.0340	***	-0.0356	***	-0.0333	***
Level of education (0 to 14)	0.0082		0.0078		0.0080		0.0074		0.0064	
Union member	0.3173	***	0.3028	***	0.3088	***	0.3021	***	0.2902	***
Spouse works full-time	-0.1713	**	-0.2008	***	-0.2168	***	-0.2141	***	-0.2238	***
Looking for full time or part time work										
Full time work only	0.1304	***	0.1321	***	0.1380	***	0.1394	***	0.1380	***
Part time work only	0.0110		-0.0313		-0.0374		-0.0479		-0.0476	
Would move interstate	-0.0610		-0.0515		-0.0652		-0.0537		-0.0497	
Received income support	-0.0537		-0.0530		-0.0380		-0.0289		-0.0433	
Received unemployment related income support	-0.5905	***	-0.5599	***	-0.5560	***	-0.5806	***	-0.5498	***
Individual spells	5 968		5 968		5 968		5 968		5 968	
Log likelihood	-10 405		-10 420		-10 413		-10 421		-10 435	
P (Weibull distribution)	0.66		0.66		0.65		0.65		0.65	
Median of distribution (days)	161		161		161		161		161	

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

APPENDIX D

POTENTIAL SOURCES OF BIAS WHEN ESTIMATING THE EFFECT OF PROGRAM PARTICIPATION

As discussed in section 6, the effect of program participation is to greatly increase the exit rate from job search. Conceivably there are a number of factors that may contribute to an over-estimation of the true effect. An examination of these factors follows.

Respondent recall

If respondents reported participation in LMPs as working episodes, and their recalled end date of the program was more than 14 days after the date recorded in the administrative data, the adjustment process described in section 5 may generate a false working spell immediately after program completion (such as in Panel 3 of Figure 5.2). This would be erroneously interpreted as a rapid exit from job search after completion of the program. Consistent with this, the programs most likely to be reported as working episodes (wage subsidy and brokered employment programs) have the largest estimated effect on the job search-to-work hazard. On the other hand, such an effect would work against other findings. Namely, the findings that these two programs increase the job-search to absent hazard and, as shown in section 7, have the greatest positive impact on the expected duration of subsequent employment spell.

Inevitably, the allowance of a 14 day mismatch was a somewhat arbitrary choice. The results of a sensitivity analysis are shown in Table D1. The estimated coefficients on the program participation variables are shown for the job-search to work hazard when allowances of 7 days, 21 days and one month are made. The estimated impact of the program reduces only marginally with greater allowance for recall error in most cases. Beyond an allowance of a recall error of 1 month, the adjustment process would surely begin to delete legitimate working spells, and the potential bias may run the other way. The estimated coefficients for other variables are virtually unchanged, and hence the full results are not reported.

D1 ESTIMATED EFFECTS OF PROGRAM PARTICIPATION ON THE JOB SEARCH-TO-WORK HAZARD, IMPACT OF RECALL ERROR

<i>Allowed recall error</i>	<i>All programs</i>	<i>Training</i>	<i>Wage subsidy</i>	<i>Brokered employment</i>	<i>Job clubs</i>
7 days	-1.73	-1.55	-3.09	-2.56	-1.78
14 days(a)	-1.72	-1.56	-3.05	-2.51	-1.78
21 days	-1.67	-1.48	-3.03	-2.48	-1.74
30 days	-1.65	-1.45	-3.00	-2.47	-1.76

(a) These are the original estimates; All estimates significant at the 1% level.

The sample

The inclusion of sample dummy variables in the estimation allows the hazards to be higher or lower by a constant for the three sample groups, but imposes that the effect of program participation has the same impact for each group. Thus the results may be driven by a particularly dominant effect for one particular group. If the job search-to-work hazard is estimated only on the sample of known labour market participants, the coefficient on the variable indicating participation in any type of program is -3.22, -1.48 for Jobseekers and -1.03 for the population reference group. These compare to the all-sample estimate of -1.72. It is true, then, that there is considerable variation in the estimated effect between sample groups. However, the basic result of a large impact from program participation holds for each sample group individually. The Jobseeker group accounted for 70% of spells in which a program episode of any type occurs, known labour market program participants accounted for 28% and the PRG only 2%.

Another potential source of bias is the restriction of the sample to persons who remained in the survey for the full three waves. The effect of program participation may be over-estimated if a disproportionate number of those who dropped out of the survey were participants with long job search duration or non-participants with short duration. There is no obvious way of testing whether such a bias exists. Given evidence above of a positive correlation between mobility and exit from job search, a significant cause of attrition may be that persons move to take up work opportunities. However, this would apply to persons who had participated in programs as well as those who had not, thus at least partially negating any bias.

Survey timing

Within the time frame of the survey, spells of program participation may have been concentrated in a period in which there was a high outflow from unemployment. According to the ABS Labour Force Survey, the rate of employment growth for Australia in the first wave of the reference period (from September 1994 to September 1995) was 3.2 percent. It was markedly lower at 0.9 per cent and 1.2 percent for waves 2 and 3, respectively. The unemployment rate was more stable, averaging 8.7 per cent, 8.5 per cent and 8.6 per cent for the three waves.

The pattern of employment growth raises the possibility that, if program episodes were concentrated in the first year of the survey, they may appear to have a large impact on the exit rate to work merely due to the external conditions that prevailed when participants completed the program. Note, however, that employment growth is a result of the net flows into and out of employment. Higher employment growth is likely to be but is not necessarily associated with a higher flow rate from unemployment to employment. This is not consistent, however, with the impact of programs on the job search-to-absent hazard, which would be expected to be lower in a time of high employment growth.

Most training programs and Job Club episodes were completed in the first year of the survey. For wage subsidy programs and brokered and other employment programs, the modal year for completion was the second year of the survey. As a test of a possible timing bias, a dummy variable was included in the estimation of the job search-to-employment hazard, indicating whether the program was completed in the second half of the survey reference period. The coefficient shows that the hazard rate is significantly lower in the latter period, probably because those who continue in job search into the second half of the reference period have lower individual hazards. Its inclusion, however, has little effect on the coefficient on LMP participation. Similarly, partitioning the sample of job search spells which included a period of program participation into those completed in the first half of the reference period and those completed in the second half has almost no effect on the estimated program effect. Hence the timing of program participation within the reference period appears to have little influence on the results.

Missing data

The data relating to episodes of labour market program participation are only available if the respondent gave permission for matching with DEETYA administrative records. As discussed in section 4, we have assumed that non-consent implied that the person did not have a DEETYA record. However, a bias will occur if non-consenting participants systematically had more favourable or unfavourable outcomes.

There is no way of ascertaining the extent of such a bias, but our assessment is that it would be marginal for the following reasons. First, persons were asked for consent at the beginning of the survey. So for the vast bulk of episodes of program participation the respondent would not even have known whether they were going to enter a program or what the outcome would be. This limits the potential for non-response to be systematically related to program experience.

Second, the most likely way in which bias may occur would seem to be if persons who gained a positive effect from participating in a program were more likely to consent to having their administrative records matched. This would lead to an over-estimation of the program effect. Yet, as discussed above, when the hazard is estimated from individual samples, the effect is largest for the known program participant sample for whom the consent rate is highest and hence the potential for bias is smallest. The estimated effect is lowest for the PRG, for whom the consent rate is smallest. Furthermore, an analysis of the labour force status variables shows that, for all three sample groups, persons who did not consent to having their DEETYA administrative records matched were considerably less likely to be looking for work at each reference point. This is consistent with the view that non-consent largely arises because no administrative record existed.

APPENDIX E

PPM OUTCOMES

Tables E1 and E2 report the frequencies for the full range of possible PPM and labour market activity outcomes. Table E3 maps out the concordance between the two measures for those spells with known PPM outcome values (the labour market activity outcome is known for all spells). It can be seen from the frequencies in the principal diagonal that the concordance is quite high. The correct concordance occurs for 58 per cent of program spells. For the 726 program episodes which returned a post program monitoring outcome of “employed”, 75% also returned an “unsubsidised work” outcome when derived from the labour market activity variables.

E1 PPM OUTCOMES, BY PROGRAM—SEUP EPISODES

<i>Program type/Program</i>	<i>In unsubsidised employment (1)</i>	<i>Unemployed (2)</i>	<i>In further assistance (3)</i>	<i>Not in labour force (4)</i>	<i>Total (5)</i>	<i>Episodes with known outcomes (6)</i>	<i>Total episodes (7)</i>	<i>Comparison to DEETYA [1/{5-3}]</i>
	<i>%</i>		<i>%</i>	<i>%</i>	<i>%</i>	<i>no.</i>	<i>no.</i>	<i>no.</i>
Wage subsidy								
Jobstart	38.4	44.0	13.8	3.8	100.0	318	787	44.5
Brokered and other employment								
Jobskills	26.2	55.2	13.8	4.8	100.0	210	289	30.4
New work opportunities	20.1	54.6	20.6	4.6	100.0	194	249	25.3
LEAP	20.7	65.5	13.8	0.0	100.0	58	87	24.0
Training								
Skillshare	20.7	45.5	28.8	5.0	100.0	1 000	1 294	29.1
Jobtrain	15.5	40.2	41.7	2.6	100.0	575	717	26.6
Special intervention	9.4	37.4	48.1	5.1	100.0	663	844	18.0
Job search assistance								
Job clubs	15.9	39.8	42.4	1.9	100.0	377	469	27.6

E2 THREE MONTH PROGRAM OUTCOMES ACCORDING TO SEUP LABOUR MARKET ACTIVITY

<i>Program type/Program</i>	<i>Unsubsidised work (1)</i>	<i>Looking for work (2)</i>	<i>In further assistance (3)</i>	<i>Absent (4)</i>	<i>Total (5)</i>	<i>Total episodes (6)</i>	<i>Comparison to DEETYA [1/{5-3}]</i>
	<i>%</i>		<i>%</i>	<i>%</i>	<i>%</i>	<i>no.</i>	<i>no.</i>
Wage subsidy							
Jobstart	51.0	36.0	7.6	5.5	100.0	787	55.2
Brokered and other employment							
Jobskills	34.3	46.7	10.7	8.3	100.0	289	38.4
New work opportunities	24.1	56.6	12.4	6.8	100.0	249	27.5
LEAP	26.4	59.8	9.2	4.6	100.0	87	29.1
Training							
Skillshare	23.3	44.8	25.4	6.4	100.0	1 294	31.3
Jobtrain	23.7	45.3	24.3	6.7	100.0	717	31.3
Special intervention	16.7	40.4	29.7	13.2	100.0	844	23.8
Job search assistance							
Job clubs	24.7	46.5	26.0	2.8	100.0	469	33.4

E3

CONCORDANCE OF OUTCOMES

<i>Labour market activity outcome</i>	<i>PPM Outcome</i>				<i>Total</i>
	<i>Employed</i>	<i>Unem- ployed</i>	<i>In further assistance</i>	<i>Not in labour force</i>	
	<i>no.</i>	<i>no.</i>	<i>no.</i>	<i>no.</i>	<i>no.</i>
Unsubsidised work	546	154	141	7	848
Looking for work	77	1 193	303	25	1 598
In further assistance	101	145	728	19	993
Absent	2	77	50	92	221
Total	726	1 569	1 222	143	3 660

APPENDIX F

ORIGINAL REGRESSION ESTIMATES OF THE PROBABILITY OF UNSUBSIDISED WORK

F1

PROBABILITY OF BEING IN UNSUBSIDISED WORK—LOGISTIC REGRESSION RESULTS

Variable	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-2.146 ***	-1.609 ***	-0.888 *	-0.878	0.016
Program type					
Training	-0.577 ***	-0.403 ***	-0.043	0.036	0.077
Wage subsidy	-0.210	-1.217 ***	0.871 ***	1.601 ***	2.292 ***
Brokered and other employment programs	-1.273 **	-0.511 **	0.371 *	0.462 **	1.155 ***
Job search assistance	-0.274	-0.476 *	-0.076	0.187	0.581
Sample sub-group					
Job seeker	-1.840 ***	0.029	-0.221	-0.524 *	-0.628 **
Known LMP participant	-0.819 **	0.653 *	0.301	-0.041	-0.649 *
Male	0.120	-0.047	0.132	-0.086	-0.468 ***
Age 15–19	0.309	0.018	-0.209	0.283	-0.142
Age 20–24	0.164	0.060	-0.290	0.136	-0.055
Age 45–59	-0.387	-0.397 **	-0.050	-0.289	-0.621 **
Duration	-0.040	-0.114 ***	-0.032	-0.013	-0.109 ***
Married	0.310	0.121	-0.243	-0.364 *	0.099
Birthplace					
Australia	0.591	0.353	0.049	-0.346	-0.426
Main English speaking country	0.464	0.664 **	0.090	-0.087	-0.325
Married with dependents	-0.132	0.067	0.360 *	0.448 **	0.000
Female with child less than 3	0.217	-0.205	0.618 **	-0.396	-0.039
Speaks English					
Well/very well	0.209	0.128	-0.117	-0.365	-0.176
Fairly well	0.247	-0.207	-0.030	-0.818 *	-0.520
Not well/not at all	-0.102	-0.268	-1.713 ***	-1.379 *	-0.762
Has disability	-0.047	-0.008	-0.221	0.047	0.322
Disability impedes employment	-0.690 **	-0.377 **	0.105	-0.416 *	-0.953 ***
Socio-economic index	0.002	0.038 **	0.005	0.037	0.027
Labour market history					
Experience (years)	0.011	0.003	-0.016	0.005	0.009
Years looking for work	-0.006	-0.078 ***	-0.104 ***	-0.044 ***	-0.090 ***
Union member	0.649 ***	1.339 ***	0.353	0.654 ***	1.000 ***
Level of education (0–14)	0.076 ***	0.021	0.025	0.021	0.040 *
Spouse works full-time	-0.332	-0.101	-0.167	0.137	0.008
Looking for					
Full-time work only	-0.172	0.019	0.017	0.209	0.140
Part-time work only	-0.352	-0.353 **	-0.656 ***	-0.576 ***	-0.327
Would move interstate	0.992 ***	0.884 ***	0.871 ***	0.666 ***	0.369 *
Received income support	0.153	-0.526 ***	-0.656 ***	-0.671 ***	-0.497 *
Received unemployment related income support	-0.504 *	-0.246	-0.445 **	-0.038	0.122
Chi-squared	171 ***	493 ***	294 ***	235 ***	264 ***
Degrees of freedom	32	32	32	32	32
Individual spells	2 829	3 194	2 275	1 768	1 408

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Note: Number of completed episodes of program participation by type are as per Table 8.5.

APPENDIX G

PROGRAM PARTICIPATION MODELS

G1 PROBABILITY OF PARTICIPATING IN A LABOUR MARKET PROGRAM—LOGIT MODEL RESULTS USING 5 PERIOD POOLED DATA

<i>Variable</i>	<i>Training</i>	<i>Wage subsidy</i>	<i>Brokered and other employment</i>	<i>Job search assistance</i>
Constant	-2.168 ***	-3.529 ***	-4.726 ***	3.030 ***
Sample sub-group				
Job seeker	0.564 ***	0.433	0.440	0.033 *
Known LMP participant	3.060 ***	3.311 ***	2.746 ***	2.495 ***
Male	-0.173 ***	0.130	-0.037	-0.167
Age 15–19	-0.045	0.223	-0.027	-0.108
Age 20–24	-0.046	0.268 *	0.082	0.097
Age 45–59	-0.252 ***	-0.449 **	-0.225	-0.124
Duration	0.125 ***	0.137 ***	0.269 ***	0.95 ***
Married	-0.279 ***	-0.059	-0.559 ***	0.169 *
Birthplace				
Australia	-0.419 ***	-0.575 **	0.105	-0.562 **
Main English speaking country	-0.238	-0.798 ***	0.251	-0.345
Married with dependents	-0.024	-0.017	0.460 ***	-0.548 ***
Female with child less than 3	-0.170	0.082	-1.113 **	-0.796 **
Speaks English				
Well/very well	-0.135	-0.501 **	0.140	0.106
Fairly well	0.181	-0.561 *	-0.603 **	-0.690 **
Not well/not at all	-0.180	-2.542 ***	-2.348 ***	-2.135 ***
Has disability	0.287 ***	0.142	-0.087	-0.242
Disability impedes employment	-0.320 ***	-0.791 ***	-0.236	0.024
Socio-economic index (CD)	-0.004	0.006	-0.039 **	0.009
Labour market history				
Experience (years)	-0.009 **	-0.005	-0.013 *	-0.020 **
Years looking for work	0.022 **	0.012 ***	0.021	0.007 ***
Union member	0.165 ***	0.290 *	0.027	0.102
Level of education (0–14)	0.006	-0.048 ***	0.021	0.013
Spouse works full-time	-0.346 ***	-0.312	-0.925 ***	-0.490 **
Looking for				
Full-time work only	0.095 *	0.013	-0.031	0.279 ***
Part-time work only	-0.723 ***	-0.947 ***	-0.596 ***	-0.832 ***
Would move interstate	0.398 ***	0.834 ***	0.909 ***	0.361 ***
Received income support	0.066	-0.390 *	-0.545 ***	0.129
Received unemployment related income support	0.868 ***	1.358 ***	1.779 ***	0.904 ***
Chi-squared	2 267 ***	1 226 ***	1 379 ***	635 ***
Degrees of freedom	28	28	28	28
Individual spells	9 292	7 097	7 166	6 819

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Variable	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-1.338 ***	-1.097 ***	-0.495 ***	-0.801 **	0.164
Training programs	0.194	0.551	0.438	-2.115 **	0.475
Sample sub-group					
Job seeker	-1.076 ***	-0.007	-0.223	-0.350 **	-0.457 ***
Known LMP participant	-0.901	-0.268	-0.475	0.666 *	-0.510
Male	0.096	0.006	0.058	-0.117	-0.122
Age 15–19	0.107	0.030	-0.160	0.282	0.000
Age 20–24	-0.012	0.054	-0.089	0.095	0.092
Age 45–59	-0.202	-0.232 **	-0.047	-0.291	-0.379 *
Duration	-0.018	-0.088 ***	-0.052 *	0.055	-0.134 ***
Married	0.287 **	0.144	-0.093	-0.398 **	0.114
Birthplace					
Australia	0.479 **	0.245	0.078	0.128	-0.327
Main English speaking country	0.380	0.298 *	0.101	0.250	-0.166
Married with dependents	-0.079	0.029	0.191	0.427 ***	-0.099
Female with child less than 3	0.092	-0.179	0.398 **	-0.233	-0.169
Speaks English					
Well/very well	0.266	0.128	0.037	-0.081	-0.404
Fairly well	0.216	-0.154	-0.009	0.048	-0.474
Not well/not at all	0.098	-0.104	-0.938 ***	-0.235	-0.718 *
Disability impedes employment	-0.301 ***	-0.234 ***	-0.093	-0.310 ***	-0.431 ***
Socio-economic index	0.009	0.017 *	0.012	0.015	0.031
Labour market history					
Experience (years)	0.001	0.001	-0.007	-0.004	0.003
Years looking for work	-0.004	-0.036 ***	-0.054 ***	-0.011	-0.034
Union member	0.319 **	0.799 ***	0.280	0.996 ***	0.611 ***
Level of education (0–14)	0.038 ***	0.014	0.008	0.011	0.028 *
Spouse works full-time	-0.171	-0.016	-0.076	0.113	0.189
Looking for					
Full-time work only	-0.095	0.006	-0.037	0.117	0.143
Part-time work only	-0.139	-0.09	-0.371 ***	-0.513 ***	-0.103
Would move interstate	0.425 ***	0.486 ***	0.389 ***	0.569 ***	0.015
Received income support	-0.04	-0.301 ***	-0.303 **	-0.437 ***	-0.104
Received unemployment related income support	-0.154	-0.172	-0.202	0.677 **	0.051
Lambda	-0.276	-0.433	-0.249	1.239 **	-0.252
Chi-squared	130 ***	406 ***	177 ***	124 ***	163 ***
Degrees of freedom	29	29	29	29	29
Individual spells	2 348	2 732	1 811	1 329	1 072

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Variable	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-1.083 **	-1.130 ***	-1.115 ***	-0.732 *	0.205
Wage subsidy programs	-0.907	-0.716	0.922	1.234 *	2.018 ***
Sample sub-group					
Job seeker	-1.071 ***	0.152	-0.213	-0.409 **	-0.519 **
Known LMP participant	0.004	0.744	0.095	-0.231	-0.689 **
Male	0.035	0.026	0.089	-0.023	-0.147
Age 15–19	0.131	-0.052	-0.141	-0.033	-0.133
Age 45–59	-0.168	-0.134	-0.123	-0.083	-0.425 **
Duration	-0.023	-0.087 ***	-0.023	-0.002	-0.107
Married	0.290 *	0.066	-0.099	-0.380 **	-0.107
Birthplace					
Australia	0.419	0.219	0.508 **	0.144	-0.294
Main English speaking country	0.347	0.247	0.522 **	0.233	-0.431
Married with dependents	-0.158	0.088	0.043	0.241	-0.031
Female with child less than 3	-0.008	-0.168	0.217	-0.465 *	0.116
Speaks English					
Well/very well	0.134	0.114	0.656 ***	0.073	-0.286
Fairly well	0.063	-0.007	0.564 **	-0.043	-0.364
Not well/not at all	-0.213	-0.050		-0.131	-0.192
Has disability	0.099	-0.062	0.002	0.157	0.237
Disability impedes employment	-0.425 **	-0.331 **	-0.037	-0.519 ***	-0.478 **
Socio-economic index	-0.003	0.012	0.002	0.047 **	0.022
Labour market history					
Experience (years)	-0.003	-0.005	-0.007	-0.004	0.008
Years looking for work	0.005	-0.050 ***	-0.057 ***	-0.044 **	-0.023
Union member	0.214	0.900 ***	0.380 **	0.464 **	0.704 ***
Level of education (0–14)	0.038 **	0.025 **	0.011	0.018	0.033 **
Spouse works full-time	-0.280 *	-0.072	0.092	0.215	0.241
Looking for					
Full-time work only	0.010	0.021	-0.014	0.035	0.074
Part-time work only	-0.239	-0.106	-0.342 ***	-0.579 ***	-0.122
Would move interstate	0.478 ***	0.626 ***	0.558 ***	0.434 ***	0.037
Received income support	0.020	-0.321 ***	-0.441 ***	-0.353 **	-0.429 **
Received unemployment related income support	-0.057	-0.051	-0.160	-0.058	0.179
Lambda	0.359	-0.080	-0.321	-0.190	-0.377
Chi-squared	110 ***	405 ***	226 ***	237 ***	233 ***
Degrees of freedom	29	29	29	29	29
Individual spells	1 687	2 039	1 320	1 070	981

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Variable	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-1.139 ***	-1.129 ***	-0.634 **	-1.523 ***	-0.057
Brokered and other employment programs	-0.651	0.301	-0.068	-1.745 ***	0.374
Sample sub-group					
Job seeker	-1.078 ***	0.144	-0.196	-0.255	-0.467 ***
Known LMP participant	-0.207	0.290	0.230	0.562	-0.386
Male	0.016	0.051	0.137	-0.091	-0.188
Age 15–19	0.120	0.006	-0.422 **	0.016	0.039
Age 20–24	-0.025	0.030	-0.251 *	0.005	0.130
Age 45–59	-0.153	-0.164	0.003	0.350 *	-0.554 ***
Duration	-0.025	-0.094 ***	-0.019	0.060 *	-0.108 ***
Married	0.333 **	0.039	-0.051	-0.432 ***	-0.124
Birthplace					
Australia	0.413 **	0.161	0.180	0.503 ***	-0.049
Main English speaking country	0.330	0.283 *	0.184	0.560 **	0.060
Married with dependents	-0.143	0.107	0.064	0.361 **	0.128
Female with child less than 3	0.076	-0.202	-0.242	-0.659 **	-0.010
Speaks English					
Well/very well	0.170	0.080	0.300 *	0.231	0.000
Not well/not at all	-0.205	-0.027	-1.223 **	-2.08	-0.113
Has disability	0.025	0.007	-0.001	0.064	0.156
Disability impedes employment	-0.367 **	-0.328 **	-0.068	-0.414 **	-0.468 **
Socio-economic index	0.004	0.015	0.003	0.033 *	0.036
Labour market history					
Experience (years)	-0.001	-0.002	-0.018 **	0.005	0.012
Years looking for work	0.009	-0.052 ***	-0.069 ***	-0.022	-0.057 **
Union member	0.058	0.974 ***	0.298	0.602 ***	0.823 ***
Level of education (0–14)	0.034 **	0.015	0.012	0.004	0.017
Spouse works full-time	-0.331 **	-0.031	-0.030	0.133	0.096
Looking for					
Full-time work only	0.027	-0.003	0.068	0.109	0.119
Part-time work only	-0.180	-0.089	-0.297 **	-0.458 ***	-0.133
Would move interstate	0.450 **	0.653 ***	0.622 ***	0.767 ***	0.094
Received income support	-0.035	-0.331 ***	-0.497 ***	-0.488 ***	-0.418 **
Received unemployment related income support	-0.046	-0.082	0.015	0.54 **	0.309
Lambda	-0.122	-0.388	0.137	1.2 ***	0.275
Chi-squared	110 ***	398 ***	173 ***	133 ***	182 ***
Degrees of freedom	29	29	29	29	29
Individual spells	1 654	2 045	1 348	1 134	985

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Variable	Period 1	Period 2	Period 3	Period 4	Period 5
Constant	-1.266 ***	-1.080 ***	-0.963 ***	0.722	0.702
Job search assistance programs	-1.301	-0.590	0.253	-0.954	0.671
Sample sub-group					
Job seeker	-1.010 ***	0.096	-0.186	-0.450	-0.586 ***
Known LMP participant	0.209	0.207	-0.700	-0.393	-0.549
Male	0.030	0.000	0.063	0.054	-0.032
Age 15–19	0.104	-0.002	-0.303	-0.028	-0.188
Age 20–24	0.079	0.066	-0.236	0.047	0.116
Age 45–59	-0.093	-0.146	-0.100	-0.170	-0.422 **
Duration	-0.028	-0.088 ***	-0.051 **	-0.016	-0.136
Married	0.199	0.045	-0.153	-0.653 ***	-0.150
Birthplace					
Australia	0.449 *	0.224	0.473 **	0.172	-0.513 *
Main English speaking country	0.359	0.296	0.486 **	0.21	-0.414
Married with dependents	-0.171	0.069	0.094	0.493 ***	-0.001
Female with child less than 3	0.184	-0.171	0.232	-0.609 **	-0.042
Speaks English					
Well/very well	0.192	0.094	0.443 **	-0.014	-0.409
Fairly well	0.178	-0.019	0.437 *	-0.263	-0.664 *
Not well/not at all	-0.203	-0.048	—	-0.073	-0.648
Has disability	-0.001	-0.096	0.003	0.050	0.165
Disability impedes employment	-0.390 **	-0.260 *	-0.025	-0.336 *	-0.561 ***
Socio-economic index	-0.001	0.014	0.011	0.050 **	0.035 *
Labour market history					
Experience (years)	0.003	0.000	-0.012 *	-0.001	0.002
Years looking for work	0.014	-0.044 ***	-0.050 **	-0.037 *	-0.025
Union member	0.074	0.907 ***	0.528 ***	0.838 ***	0.738 ***
Level of education (0–14)	0.041 ***	0.020 *	0.007	0.002	0.029
Spouse works full-time	-0.312 *	-0.055	0.080	0.340 *	0.274
Looking for part-time work only	-0.164	-0.123	-0.373 ***	-0.447 ***	-0.124
Would move interstate	0.496 ***	0.621 ***	0.635 ***	0.422 ***	-0.092
Received income support	0.094	-0.365 ***	-0.409 ***	-3.361 **	-0.366 **
Received unemployment related income support	-0.068	0.027	0.032	0.403 *	0.274
Lambda	0.564	0.194	-0.168	0.570	-0.155
Chi-squared	95 ***	374 ***	149 ***	128 ***	159 ***
Degrees of freedom	29	29	29	29	29
Individual spells	1 655	2 009	1 258	1 001	896

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

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