

## **Occasional Paper**

# **Job Quality and Churning of the Pool of the Unemployed**

**An Application Using the Survey  
of Employment and  
Unemployment Patterns**



New  
Issue

**Occasional paper**

# **Job Quality and Churning of the Pool of the Unemployed**

## **An Application Using the Survey of Employment and Unemployment Patterns**

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## INQUIRIES

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# CONTENTS

Page

List of tables and graphs	v
Abbreviations and other symbols	viii
Synopsis	ix

## SECTION

<b>1</b>	Introduction	1
	Definition of job churning	1
	Methods of measuring job quality	1
	Objectives of the study	5
	Structure of the study	5
<b>2</b>	The Survey of Employment and Unemployment Patterns	7
	Structure of the survey	7
	Analyses of churning	9
	Controlling for educational attainment	14
	Case study of Jobseekers	18
<b>3</b>	Occupation and job quality	20
	Aspects of the SEUP data	20
	The occupational distributions of the Jobseeker and Population Reference groups	23
	The Duncan index of dissimilarity	25
	The ANU3 index of socioeconomic status	26
<b>4</b>	Analysis of occupational status	29
	The occupational status model	30
	Determinants of occupational status	30
	Using the model to measure job quality	35
	Ordinary least squares results	36
	Predicted occupational status score for Jobseekers	42
	Decomposition of the occupational status differential	43
<b>5</b>	Analysis of a probability model of occupational outcomes	47
	An ordered probit model	47
	Ordered probit results	51
	Predicted occupational distribution	53

## SECTION

<b>6</b>	Job quality and job churning	60
	Models of job duration	61
	Estimation methods	64
	Results from logit models of job tenure	66
	Results from parametric duration models	76
	Ordinary least squares results for Jobseekers who had left current jobs	79
	Comparison of results across models	84
<b>7</b>	Earnings and job tenure	85
	The wage model	85
	Empirical results of the determinants of earnings	91
	Creating a job quality variable using wages	96
	Logistic analyses of job tenure	97
	Results from parametric duration models	103
<b>8</b>	Conclusion	108

## ADDITIONAL INFORMATION

	Appendix A Definitions and means of variables	114
	Appendix B Models of occupational status for males and females	122
	Appendix C Results from models of job tenure	124
	Appendix D Results from earnings models	127
	Appendix E Models of job tenure	129
	References	131

## LIST OF TABLES AND GRAPHS

Page

### THE SURVEY OF EMPLOYMENT AND UNEMPLOYMENT PATTERNS

<b>2.1</b>	Distribution of working episodes for the Population Reference and Jobseeker groups, 1995–1997	9
<b>2.2</b>	Percent distribution of Population Reference and Jobseeker groups across episodes of work, 1995–1997	11
<b>2.3</b>	Percent distribution of Population Reference and Jobseeker groups across episodes of work	12
<b>2.4</b>	Percent distribution of the Population Reference group across episodes of work by educational attainment	15
<b>2.5</b>	Percent distribution of the Jobseeker group across episodes of work by educational attainment	16

### OCCUPATION AND JOB QUALITY

<b>3.1</b>	Number of Jobseekers who worked, 1995–1997	21
<b>3.2</b>	Occupational distribution by sex, Population Reference and Jobseeker groups, 1995	23
<b>3.3</b>	Mean values of the ANU3 scale for the Population Reference and Jobseeker groups	27

### ANALYSIS OF OCCUPATIONAL STATUS

<b>4.1</b>	Ordinary least squares estimates of model of occupational status, Population Reference and Jobseeker groups, 1995	38
<b>4.2</b>	Predicted and actual occupational status scores of Jobseekers	43
<b>4.3</b>	Decomposition of the occupational status differential between the Population Reference and Jobseeker groups	45

### ANALYSIS OF A PROBABILITY MODEL OF OCCUPATIONAL OUTCOMES

<b>5.1</b>	Ordered probit estimates of model of occupational outcomes, Population Reference and Jobseeker groups, 1995	52
<b>5.2</b>	Predicted occupational distribution by educational attainment for Population Reference and Jobseeker groups	55
<b>5.3</b>	Predicted occupational distribution by duration of current job for Population Reference and Jobseeker groups	56
<b>5.4</b>	Actual and simulated occupational distributions	57

LIST OF TABLES AND GRAPHS *continued*

Page

JOB QUALITY AND JOB CHURNING

<b>6.1</b>	Logistic analysis of the probability of Jobseekers having jobs that lasted six months or more	69
<b>6.2</b>	Logistic analysis of the probability of Jobseekers having jobs that lasted six months or more, alternative measures of job quality	74
<b>6.3</b>	Logistic analysis of the probability of Jobseekers having jobs that lasted 12 months or more	75
<b>6.4</b>	Estimated hazard function for Jobseekers (graph)	76
<b>6.5</b>	Estimates of the Weibull model of job tenure for Jobseekers	77
<b>6.6</b>	Estimates of the Weibull model of job tenure for Jobseekers, alternative measures of job quality	80
<b>6.7</b>	Ordinary least squares results of job tenure for Jobseekers who had left job	82
<b>6.8</b>	Ordinary least squares results of job tenure for Jobseekers who had left job, alternative measures of job quality	83

EARNINGS AND JOB TENURE

<b>7.1</b>	Ordinary least squares results of earnings for the Population Reference and Jobseeker groups, 1995	92
<b>7.2</b>	Logistic analysis of the probability of Jobseekers having jobs that lasted six months or more	98
<b>7.3</b>	Logistic analysis of the probability of Jobseekers having jobs that lasted six months or more, alternative measure of job quality	102
<b>7.4</b>	Estimated hazard function for Jobseekers (graph)	104
<b>7.5</b>	Estimates of the Weibull model of job tenure for Jobseekers	105
<b>7.6</b>	Estimates of the Weibull model of job tenure for Jobseekers, alternative measure of job quality	107

APPENDIXES

<b>A1</b>	Means and standard deviations of variables, Population Reference and Jobseeker groups	119
<b>B1</b>	Analyses of occupational status for males and females, Population Reference group, 1995	122
<b>B2</b>	Analyses of occupational status for males and females, Jobseeker group, 1995	123



LIST OF TABLES AND GRAPHS *continued*

	Page
<b>C1</b> Logistic analysis of the probability of Jobseekers with jobs that lasted six months or more, excluding job quality	124
<b>C2</b> Logistic analysis of the probability of Jobseekers with jobs that lasted 12 months or more, alternative measures of job quality	125
<b>C3</b> Estimates of the Weibull model of job tenure for Jobseekers, excluding job quality	126
<b>D1</b> Ordinary least squares results of earnings for males and females, Population Reference group, 1995	127
<b>D2</b> Ordinary least squares results of earnings for males and females, Jobseeker group, 1995	128
<b>E1</b> Logistic analysis of the probability of Jobseekers with jobs that lasted six months or more, excluding job quality	129
<b>E2</b> Estimates of the Weibull model of job tenure for Jobseekers, excluding job quality	130

## ABBREVIATIONS AND OTHER SYMBOLS

### ABBREVIATIONS

ABS	Australian Bureau of Statistics
ASCO	Australian Standard Classification of Occupations
SEUP	Survey of Employment and Unemployment Patterns

### SYMBOLS

*	Subject to sampling variability too high for most practical purposes.
. .	not applicable

## SYNOPSIS

Currently, over 7% of Australia's labour market participants are unemployed. Such a high rate of unemployment is considered undesirable because it brings economic and social hardship to a large segment of the population. One of the main concerns in relation to this unemployment problem at the present time is the recurring unemployment of the same group of people. This arises when individuals who had been unemployed are employed for a short period of time and then return to the pool of unemployment. This process is called job churning. It may be caused by inadequate skills of the workers or by the poor quality of the job they obtain. Both of these factors can result in a poor job match and so be associated with high rates of job turnover.

This study uses data from the Survey of Employment and Unemployment Patterns (SEUP) to examine the determinants of occupational status and wages, and identify the factors (e.g. individual-related characteristics, job quality) contributing to job churning among persons identified as 'Jobseekers' at May 1995. The SEUP is a longitudinal survey of individuals aged 15–59 years at May 1995. It has three components: a random sample of the population termed the Population Reference group; a sample of unemployed persons, underemployed persons and persons not in the labour force who were likely to enter the labour force in the near future termed the Jobseeker group; and a group of individuals who had started a subsidised employment placement and/or started a labour market training program termed the Labour Market Program participants group. Workers from the Population Reference group provide a benchmark sample in this study against which the occupational status and wages of Jobseekers, as measures of job quality, can be compared.

A review of the data shows that, for a group of individuals who worked between 1995 and 1997, there is a higher percentage of Jobseekers who had more than one job than is the case for members of the Population Reference group. For example, in 1997 31% of the Jobseekers had more than one job compared to 24% of workers from the Population Reference group. In addition, the average duration of the job held by Jobseekers is less than that held by the typical workers from the Population Reference group. For example, in 1997 the average duration of work for Jobseekers is only 182 days compared to 276 days for the Population Reference group.

A detailed analysis of the labour market activity of a number of randomly selected individuals reveals that Jobseekers generally have a number of short episodes of work interspersed with lengthy periods of specialist job search. Hence, the problem for many of the unemployed is not only that it takes them a considerable period of time to find a job, but the jobs they find typically last for only a short period, after which they return to the pool of unemployment.

A number of important determinants of occupational outcomes are identified in this study. In the first instance, each occupation is assigned a score from the ANU3 status attainment scale (Jones 1989) and variations in this score across members of both the Population Reference and Jobseeker groups are examined. The mean value of the ANU3 scale for the Jobseeker group (22 points) is much lower than that for the Population Reference group (32 points). Hence, Jobseekers occupy jobs that have, on average, lower occupational prestige than the jobs held by workers from the Population Reference group. The results from the occupational status attainment model show that individuals with high occupational status scores are those who are well educated, have general as well as firm-specific skills, are proficient in English, have spent little time looking for work, and reside in areas with a high value of the socioeconomic index. For example, Jobseekers who have completed high school, who possess a skilled vocational qualification, or who possess a bachelor degree or higher, are in occupations with ANU3 status scores that on average are 4, 5 and 21 points, respectively, higher than the ANU3 status score of the occupations of those who had left school at 15 years of age or younger.

The second focus of the study of the data on occupations involves examination of the distribution of workers across occupations. These data show that there is a relatively high representation of the typical workers from the Population Reference group in the most prestigious occupations and a relatively high representation of Jobseekers in the least prestigious occupations. An ordered probit model is estimated to show how factors such as educational attainment and firm-specific experience affect the occupation that a worker is employed in. For example, the predicted probability of Jobseekers who left school at 15 years of age or younger being employed in professional occupations is 2% compared to 20% for Jobseekers with a bachelor degree or higher. Conversely, the predicted probability of Jobseekers who left school at 15 years of age or younger being employed in labourer and related workers occupations is 36% compared to only 5% for Jobseekers who have a bachelor degree or higher.

In addition to educational attainment and firm-specific experience, the occupational outcomes of individuals are significantly affected by the level of English proficiency, the duration of looking for work since the individuals first left full-time education, the area of residence and the socioeconomic index of the area of residence, employment sector and the size of the location of employment.

As well as informing on the major determinants of the occupational outcomes, the model of occupational attainment is used to construct the aggregate occupational distribution that Jobseekers would obtain if on each of the education, experience and other characteristics they were distributed across occupations in exactly the same way as workers from the Population Reference group. This occupational distribution is generally termed the discrimination-free or equal treatments occupational distribution.

For example, even when Jobseekers are treated in the labour market in the same manner as workers from the Population Reference group, only 11% would be employed as managers and administrators or professionals compared to 23% of the Population Reference group being employed in the same occupations. In contrast, 35% of Jobseekers would be employed as either elementary clerical, sales and service workers or as labourers and related workers. Only 19% of members of the Population Reference group are employed in the same occupations.

Results from the wage models also reveal several differences in earnings between members of the Population Reference and Jobseeker groups. Workers from the Population Reference group receive, on average, a higher hourly wage (\$15.67) than do Jobseekers (\$11.41). The major determinants of earnings include educational attainment, general labour market experience, marital status, labour market history, sector of employment and the size of the location of employment. However, the returns to some of these factors are not uniform across the samples of the Population Reference group and Jobseekers. For example, typical workers from the Population Reference group receive a higher return to schooling than Jobseekers. The difference in earnings between the two groups is most striking among those at the extreme levels of educational attainment. For example, the earnings gains for those who attended the highest level of secondary school are almost twice as high for members of the Population Reference group as they are for Jobseekers. In comparison, the earnings advantages for individuals who possess a skilled vocational qualification are similar for workers from the Population Reference and Jobseeker groups.

The earnings differential between members of the Population Reference and Jobseeker groups is also attributable to general and firm-specific labour market experience. Thus, the return to labour market experience for Jobseekers is much lower than that for workers from the Population Reference group. With respect to firm-specific skills, the results from the earnings models show that the earnings of members of the Population Reference group are not significantly influenced by the time they spent in the job while time spent in the job is very important to the earnings of Jobseekers.

It is quite apparent that Jobseekers have jobs that are inferior, in terms of both occupational status and wages, to those held by members of the Population Reference group. A large part (perhaps as much as 80%) of the discrepancy in job quality between Jobseekers and the Population Reference group can be linked to their lack of skills and labour market experience. This is termed a justifiable difference in labour market outcomes. The remainder arises because Jobseekers are treated differently in the labour market compared to members of the Population Reference group. This is termed an unjustifiable difference in occupational outcomes or wages. Both the justifiable and unjustifiable components of the occupational outcomes and wages may be associated with the length of time that jobs last.

Two measures of job quality are used to study the link between job turnover and job quality. The first measure involves evaluating job quality on the basis of a worker's occupational status. Both an absolute scale given by the status attainment score (ANU3 status score) of the worker's occupation, and a relative scale computed either as the difference between a worker's expected and actual occupational status, or the difference between a worker's expected and actual occupational outcomes, are considered in models of job tenure. The occupational status score has the potential to capture the general 'goodness' of the job, which includes both pecuniary and non-pecuniary compensations. The second measure focuses on the pecuniary compensations of the job. Again, both an absolute scale provided by a worker's wage, and a relative scale given by the difference between the expected and actual earnings of the job, are considered. These measures of job quality are generalised by classifying jobs as 'good'/poor' if they are greater/less than their expected status by a certain threshold. Using this algorithm, 39% of Jobseekers are categorised as working in poor jobs.

The impact of job quality on churning in the pool of unemployment is analysed using logit models of binary indicators of whether the job match was successful, parametric duration models and models of completed job tenure for a subset of the workers that are estimated using Ordinary Least Squares. With respect to the logit models, two criteria for a good job match are used, namely jobs that last for six months or more and a more stringent criterion of jobs lasting 12 months or more. Overall, the results show that human capital characteristics (e.g. educational attainment, English proficiency, marital status, sex) and structural factors (e.g. area of residence, sector of employment, the size of the location of employment) have relatively weak influences on the chances that Jobseekers are successfully matched to the current job. In comparison, the labour market experience and labour market history variables are strong determinants of the probability of Jobseekers being successfully matched to the job. For example, compared to Jobseekers who had worked prior to obtaining the current job, those who had never worked are 30 percentage points less likely to be successfully matched to the current job. This suggests that labour market entrants engage in job shopping and consequently they experience high job turnover compared to Jobseekers who had worked previously. These results are robust across model specifications.

An important finding from the logit models is that the absolute measure of job quality given by the status attainment score has a significant effect on the probability of a successful job match. For example, Jobseekers with high occupational status scores (i.e. those who have good jobs) are more likely to be successfully matched to the job. However, the effects of the relative measures of job quality, computed as the difference between a worker's expected and actual occupational status, are ambiguous. These results are not sensitive to the definition of a successful job match used. A similar set of findings emerges when models of completed job tenure

are estimated for Jobseekers who had left their jobs. Therefore, it is unclear from the non-pecuniary measures of job quality whether the relative dimension of job quality, where the jobs are assessed against objective assessments of occupational achievement, has an influence on whether Jobseekers are successfully matched to the job. Given the significance of the absolute measure of job quality on job tenure, it can be argued that if we place a highly skilled worker in a poor job that worker is just as likely to leave that job as a less skilled worker in the same job.

The results from the parametric duration models show a strong statistical relationship between job tenure and job quality, defined with reference to the status attainment scores. Of particular note is the finding that both the absolute and relative measures of job quality are significant determinants of job tenure. For example, Jobseekers in occupations having a relatively high occupational status are less likely to leave their jobs at any given point in time, and so have longer job tenure, *ceteris paribus*. Conversely, Jobseekers who have poor jobs are more likely to leave their jobs at any given point in time.

The second aspect of the job used to index job quality is pecuniary compensation. In this instance the results from the logit models show that the job quality variables (both the absolute and relative measures of job quality) are significant determinants of the probability that Jobseekers will be successfully matched to the job. For example, Jobseekers who are working in jobs with high wages are more likely to be successfully matched to the current job and so are less likely to leave their jobs and be part of the job churning process. However, the elasticity of the probability of a successful job match with respect to the hourly wage is quite small (elasticity of 0.07), suggesting that the economic impact of this variable is quite weak. This elasticity is similar to that computed using the occupational status score to index job quality. The impact of the relative measure of job quality on the chances of there being a successful job match is negative. The result suggests that a highly skilled person working in a poor job is much more likely to leave the job than a low-skilled person working in the same job.

The importance of pecuniary rewards on job tenure in the logit models of the binary indicators of a successful job match is reinforced by the findings from the parametric duration models. For example, Jobseekers earning higher wages are more likely to continue working in the same job over time. This is consistent with the result for the ANU3 status attainment score and suggests that pecuniary and non-pecuniary compensations both offer important incentives for Jobseekers when deciding whether to continue working in the same job over time. With regard to the relative measure of job quality, it is observed that the elasticity of job tenure with respect to the poor job variable created from

the differential between expected and actual earnings is much larger than that with respect to the hourly wage. In addition, the elasticity of the poor job variable created from the differential between expected and actual earnings is greater than the elasticities of the poor job variables created from the ordinary least squares and ordered probit occupational status models.

A number of important implications follow from the results. First, given that 80% of the difference in occupational status between the Population Reference and Jobseeker groups is attributable to the inferior endowments of Jobseekers, one way to enhance the occupational status of Jobseekers would be to encourage them to at least complete high school. Moreover, given the importance of general labour market and firm-specific skills, formal education might also be combined with on-the-job training.

The second implication relates to the relationship between job quality and churning in the pool of unemployment. Given that the relative pecuniary measure of job quality has a stronger impact on job tenure than the absolute pecuniary measure of job quality, the extent of churning can be reduced by matching workers to jobs according to their characteristics, rather than relying simply on the pecuniary benefits of the job. Moreover, it appears that relative pecuniary benefits outweigh non-pecuniary benefits in terms of the decision-making process involved when changing jobs. Therefore, attempts to reduce job churning among Jobseekers should recognise that Jobseekers are likely to be more responsive to relative pecuniary rewards than to non-pecuniary rewards of the job.

Finally, longitudinal data allow the job turnover process in the labour market to be observed. The SEUP data on the number of jobs and the duration of each job over a three-year period can be combined with information on individual and job-related characteristics to examine the severity of job turnover and identify the causes of job turnover. This provides valuable information to the study of unemployment. Therefore, much can be said for the availability of longitudinal data for labour market research.

Overall, the job churning process is an important problem in the Australian labour market as it can lead to substantial unemployment for the same group of people and to increased training costs for employers. As the unemployment of these people comprises a number of spells of looking for work interrupted by, generally short, periods of work, they will not feature among the long-term unemployed. This study has examined a number of factors contributing to this phenomenon. Of particular importance is the impact of the quality of the job in reducing job turnover. In this regard, an understanding of the quality of the job can be used to help alleviate the job churning problems for Jobseekers in the Australian labour market.



## SECTION 1

## INTRODUCTION

Reducing the level of unemployment is widely regarded as one of the major macroeconomic challenges in Australia. As a result of this unemployment, currently around 700,000 persons, national output is lowered and a large segment of the population experiences considerable economic and social hardship. Labour market policy therefore has been designed to facilitate escape from this hardship. But exit from the pool of unemployment is not sufficient: the chances of a return to the pool of the unemployed must also be minimised.

### DEFINITION OF JOB CHURNING

A labour market where a group of the unemployed obtain employment that lasts for only a short period of time and then return to being unemployed is said to be characterised by churning. In such a labour market, the potential and actual membership of the pool of the unemployed comprise, to a large extent, the same group of individuals over time, and the actual membership of the unemployment state at a point in time is determined by a churning process among the broader set of candidates. Such churning is more likely where the jobs obtained in any given instance are of low quality. The prime concern of the current study is to provide information on the links between job quality and churning in the labour market.

### METHODS OF MEASURING JOB QUALITY

*Pecuniary and non-pecuniary  
benefits, job satisfaction*

There are a number of ways of measuring job quality. One is to base measurement on the pecuniary and non-pecuniary aspects of the job. The pecuniary aspects of the job include wages and other payments received. The non-pecuniary aspects refer to the non-monetary considerations that workers take into account when choosing an occupation. These can be favourable (e.g. flexible work arrangements) or unfavourable (dangerous work). In this respect jobs might be classified as 'good' or 'poor' depending on the occupation of employment, permanent/casual status of the employment, pecuniary benefits such as the rate of pay, paid sick leave and paid holiday leave, and non-pecuniary benefits such as a pleasant work environment. Most of these measures are reasonably objective, and absolute in scale.

A second main way of assessing job quality is with reference to work satisfaction. This might be satisfaction with specific aspects of the job (e.g. the rate of pay, entitlements to holidays) or it might be an overall level of satisfaction with the job. This approach can be viewed as linking

levels of pecuniary and non-pecuniary compensations of the job with the worker's (subjective) expectations. A good job might be defined as one that leaves the worker satisfied, given their expectations. Conversely, a poor job is one that falls short of the worker's expectations.

A third way of measuring job quality is to examine the discrepancy between actual outcomes and the outcome that might be expected on the basis of a worker's qualifications, experience, personal attributes and other factors known to affect labour market outcomes. In this instance a good job might be defined as one that is consistent with, or better than, the job outcome that one would have expected the worker to obtain on the basis of objective criteria. A poor job is one that falls short of the job outcome that the worker is expected to have achieved, given their background and labour market experience.

*Empirical review of job quality*

The first method for assessing job quality that is based on measurement of the pecuniary and non-pecuniary aspects of the job has a long tradition in the Australian economics and sociology literature. For example, Chiswick and Miller (1995) and Preston (1997), among others, examine the way that earnings are determined in order to assess the characteristics of the occupants of the better-paying positions in the labour force. Evans (1987) analyses a measure of occupational status to establish the way that the superior jobs are allocated across workers, while Blandy (1976–77) and Lewis (1996) examine, respectively, the industrial and occupational distributions of various groups of workers in a comparative exercise. Miller and Mulvey (1992) have a similar objective, though they broaden the scope of the enquiry by exploring the variation in a total compensation concept, defined to include wages and fringe benefits.

Other aspects of the job can be explored as part of this approach. For example, Simpson, Dawkins and Madden (1997) focus on the permanent/casual nature of employment as a way of informing on another dimension of job quality. This literature generally concludes that the better jobs (defined to be high paying jobs with fringe benefits and having a high level of occupational prestige) are held by well-educated, middle-aged male workers who were either born in Australia or were born outside of Australia in the main English-speaking countries. Conversely, the poor jobs are occupied by less-well educated workers, those who were born outside Australia in other than main English-speaking countries, and those who are either recent labour market entrants or in their pre-retirement years.

### *Worker satisfaction*

Study of worker satisfaction in Australia is more limited, mainly because there are few data sets that contain relevant information. One study is Miller (1990). In this study data from the Australian Longitudinal Survey on a range of elements of job satisfaction are analysed for union and non-union members. The dimensions of job satisfaction covered include: the individual's perception of the work environment; whether the individual is bothered by noise or dirty conditions; whether the individual finds the work interesting; whether the individual feels that he/she develops skills on-the-job; safety precautions; start and finish time; not being able to work overtime; the amount of annual leave entitlement; the amount of sick leave entitlement; current superannuation scheme; total amount of pay; security of employment; promotion opportunities; and the overall feelings towards the job. Miller's (1990) study shows that there is considerable variation in the degree of job satisfaction across occupations. Thus, workers in clerical, processing and manual occupations are less satisfied with their job than workers in the reference occupation of professional and management. It was also reported that residents of rural areas have a higher degree of satisfaction with their employment than those residing in the metropolitan areas. However, individual characteristics have little influence on job satisfaction. For example, except for the relatively high degree of job satisfaction among those who left school at year 11, the degree of job satisfaction does not vary across educational attainments or qualifications. In addition, years of labour market experience do not appear to be related to job satisfaction. Union membership, however, was found to be related to the level of job satisfaction, with union members being more dissatisfied with their jobs than non-union members.

### *Actual and predicted labour market outcomes*

The final approach to measuring job quality essentially involves estimating models of labour market outcomes (e.g. earnings, occupational attainment) and comparing the predictions from these models with the actual outcomes. This approach has been applied in a variety of situations in the overseas literature. Brown, Moon and Zoloth (1980a), for example, use a model of occupational attainment and compare the actual female occupational distribution with that which the model predicted females would have obtained if they were treated in the labour market in the same way as males. Divergences between the actual and predicted occupational distributions are used as an indicator of discrimination in occupational outcomes. A similar task is undertaken in the Australian labour market by Kidd and Meng (1997).

A further application of this approach is by Kuhn (1987)<sup>1</sup>, who models the earnings determination process in the US and Canadian labour markets and uses the models to predict cases where women should be paid more than they were actually being paid. Instances of apparent under-payment (given the characteristics of women workers) were then related to the women's perceptions of discrimination. A study of the Australian labour market that uses a similar methodology is Miller and Volker (1987). In this study the wages that youth were expected to receive, given their characteristics, were compared to the wages that they actually received<sup>2</sup>. Differences between these two measures of wages were related to the workers' level of satisfaction with the pay they receive. Almost two-thirds of the workers who stated that they were dissatisfied with the pay they were receiving were in fact receiving less than it was predicted they should receive, given their productivity-related characteristics. Miller and Volker (1987, p. 38) state "This suggests that the wage determination process summarised by the human capital approach (used to predict the workers' wages) is broadly consistent with the model individuals have in mind when making wage comparisons."

Taubman and Wales' (1974) study of occupational attainment offers a further illustration of the way economic models may be used to classify occupants of good and poor jobs, and to provide insights into why some groups of individuals are precluded from the better jobs in the workplace. They first analyse the determinants of earnings within each of a number of occupations. The results from this analysis were used to estimate the potential earnings of each individual, given their productivity-related characteristics. The occupation in which a worker should be located in order to maximise their well-being was compared with the worker's actual occupation. The extent to which the actual occupation diverged from the earnings-maximising occupation was then related to the level of education in order to determine whether education was being used as a screening device. If education is used as a screening device then entry into the better occupations would generally require a particular level of skill *and* a minimum educational attainment. In the context of the current study, entry into some jobs may be thought of as requiring a particular level of skill and a particular labour market history (e.g. absence of periods of job seeking since the individual first left full-time education).

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<sup>1</sup> See Even (1990) for a comment.

<sup>2</sup> The expected wages were computed using estimates from a human capital earnings function.

## OBJECTIVES OF THE STUDY

Each of these approaches provides useful information on the job matching and hence job churning process, and can be viewed as complementary in a comprehensive analysis of this process. They can be applied, to varying degrees, to the data collected in the Survey of Employment and Unemployment Patterns (SEUP) that is the basis of the current study.

This study will use data on occupation and earnings. These aspects of the jobs will be examined for workers in the Population Reference and Jobseeker groups in the survey. The Jobseeker group comprises individuals who are unemployed, underemployed or those with a marginal attachment to the labour force and, as such, provides an ideal basis for the study of the churning phenomenon. The rationale for the use of two groups of workers in the analysis is that information derived from the study of the Population Reference group will provide a benchmark against which the quality of the jobs obtained by the Jobseeker group can be evaluated. This evaluation will seek to classify the jobs obtained by the Jobseekers as good or poor using both absolute and relative criteria. Subsequent labour market patterns will be examined to establish if individuals in poor quality jobs are more likely to leave their job and hence be part of the churning phenomenon. The framework proposed will permit the main factors leading to poor quality jobs to be identified.

## STRUCTURE OF THE STUDY

Section 2 provides background information on the SEUP and establishes the extent of churning in the Australian labour market. Examination of aggregate data and a case study approach are both used in this exploratory analysis. In section 3 various data issues are discussed, such as the way a 'job' is defined for the Jobseeker and Population Reference groups. The occupational distribution of the jobs obtained by a group of Jobseekers is reviewed. Comparisons are made to a benchmark group of workers from the Population Reference group. In section 4 models of occupational status are estimated for both groups of workers and are used to categorise the jobs held by the Jobseekers as good or poor. The results from these models are also used to decompose the occupational status differential between Jobseekers and the Population Reference group into components due to differences in endowments (e.g. educational attainment, labour market experience) and differences in the way the endowments of the two groups are rewarded in the labour market. This exercise permits examination of whether the lower occupational status of Jobseekers can be linked to inferior educational attainments, levels of labour market experience and the like or whether it is due to Jobseekers being treated differently in the labour market. This latter factor is of particular concern where the different treatments have a basis in discriminatory practices.

Section 5 presents estimates of ordered probit models of occupational outcomes for Jobseekers and the Population Reference group. Actual and simulated occupational distributions of Jobseekers are compared to the occupational distribution of the Population Reference group. The links between endowments and the occupational distribution of Jobseekers are also discussed in this section as a way of providing further information on the causes of the dissimilarity between the occupational distributions of Jobseekers and the Population Reference group. Addressing this issue using both the models of occupational status and the ordered probit models of occupational outcomes allows the robustness of any findings to be examined.

In section 6, subsequent labour market patterns for workers with good and poor jobs are compared to provide information on the causes of labour market churning. This section is based on a detailed study of the determinants of job tenure. A number of approaches are followed, including analysis of the probability that an individual's job will last a certain length of time, and statistical failure models that provide information on the probability that a worker who has been employed for a given number of weeks will leave his or her job. Measures of both absolute and relative job quality are incorporated into each of the alternative approaches presented.

Section 7 extends the analysis to earnings. In the first part of this section estimates of models of earnings determination for Jobseekers and the Population Reference group are presented. The second part of the section categorises jobs as good or poor according to the relationship between the earnings that Jobseekers actually receive and the earnings they are expected to receive given their productivity-related characteristics and the earnings structure that prevails among the Population Reference group. The final part of section 7 links the earnings-based measures of absolute and relative job quality to job tenure using the range of models adopted in the previous section. This study of the relationship between job tenure and the earnings-based measures of job quality will permit an assessment of the robustness of the empirical findings concerning the relationship between job tenure and the quality of the job. Section 8 provides a summary and conclusion.

## SECTION 2

### THE SURVEY OF EMPLOYMENT AND UNEMPLOYMENT PATTERNS

The Survey of Employment and Unemployment Patterns (SEUP) is a longitudinal survey conducted by the Australian Bureau of Statistics (ABS) between 1995 and 1997. The survey was conducted in three waves. Wave one covered the period from September 5 1994 to September 3 1995. The second wave covered the period from September 4 1995 to September 1 1996 and the third wave covered the period from September 2 1996 to August 31 1997 (ABS 1997a).

#### STRUCTURE OF THE SURVEY

The SEUP contains data on three groups of individuals aged 15–59 at May 1995 who were residents of private dwellings. These groups consist of Jobseekers, a Population Reference group and Labour Market Program participants.

##### *Jobseekers*

The Jobseeker group initially contained 5,488 persons who were considered to be potential candidates for a labour market program at the time of the recruitment (between April and July 1995). This group comprises unemployed persons, underemployed persons and persons not in the labour force who were likely to enter the labour force in the near future. The Jobseeker group does not contain individuals who were stood down without pay for less than four weeks, full-time students aged 15–24 who were looking for part-time work or individuals who were not actively looking for work (Le & Miller 1998).

##### *Population Reference group*

The Population Reference group is a random sample of the population. The initial data collection contained 2,311 persons. This group was included in the survey to provide a benchmark sample against which the labour market transitions of specific groups of Jobseekers or Labour Market Program participants could be compared. For a detailed analysis of the Population Reference group, see the study of the risk index approach to unemployment reported in Le and Miller (1999).

##### *Labour Market Program participants*

The Labour Market Program participants group includes individuals who had started a subsidised employment placement and/or started a labour market training program between July 1994 and February 1995. The initial data collection contained 1,019 persons. This group was sampled to ensure that the survey contained a sufficient number of persons who had participated in a labour market program to enable detailed analysis of the effectiveness of these interventions in the labour market (ABS 1997a).

#### *Variable types*

The SEUP contains five types of variables, namely fixed, dynamic, episodal, occurrence and summary. These data provide valuable information for study of various aspects of the labour market, such as skill acquisition, labour market transitions, employment patterns of various groups and the effectiveness of different job search methods. For further information on the content of the SEUP, see Australian Bureau of Statistics (1997a) and Le and Miller (1998).

#### *Key SEUP variables*

A number of the variables in the SEUP can be used to study the link between job quality and churning in the labour market. The data for these variables were collected for each working episode/job during the survey reference period, and for the last full-time and part-time job before the survey reference period. The survey data relevant to this type of exercise include:

- Occupation: data are available on the occupation of each job. These data are coded using two versions of the Australian Standard Classification of Occupation and they provide a very rich source of information for the study of the general 'goodness' of the individual's employment.
- Earnings: data are available on the usual weekly earnings of each job and annual income. The focus of this study will be on the usual weekly earnings measure.
- Job status (permanent/casual): data on job status include whether the individual was classified as permanent or casual in each episode of work.
- Preference for work/different work: data are available on a set of variables. For each job there is information (where relevant) on whether the individual is employed in his/her preferred occupation, whether part-time workers would like to work more hours, the main reason for leaving the job and the main reason for working part time.

Most of the analyses in this study are based on the occupation and earnings data.



## ANALYSES OF CHURNING

The labour market churning phenomenon can be illustrated with reference to the data from the SEUP presented in tables 2.1 and 2.2. Table 2.1 lists information on several dimensions of the work activities of the Jobseeker and Population Reference groups between 1995 and 1997.

### 2.1 DISTRIBUTION OF WORKING EPISODES FOR THE POPULATION REFERENCE AND JOBSEEKER GROUPS, 1995–1997(a)

Reference period	Population Reference group			Jobseeker group		
	% with at least one working episode	Mean number & duration of episodes for groups with at least one working episode		% with at least one working episode	Mean number & duration of episodes for groups with at least one working episode	
	%	no.	duration	%	no.	duration
Wave 1	81.1	1.3	266.7	58.0	1.7	51.7
Wave 2	83.2	1.3	268.3	68.1	1.5	120.7
Wave 3	80.9	1.3	276.1	66.6	1.5	181.5

(a) Duration is measured in days.

*Percentage with at least one working episode*

A comparison of working episodes between Jobseekers and members of the Population Reference group shows that the former perform less well than the latter. For example, at most 68% of the Jobseekers have one or more working episodes in a particular reference period. The comparable percentage figure for the Population Reference group is much higher, with at least 81% having at least one working episode in each of the three reference periods considered. This difference is largest for wave one, where 81% of the Population Reference group and only 58% of Jobseekers had at least one working episode.

Such a sizeable difference between the average labour market experience of the Population Reference and Jobseeker groups in wave one would be expected, given the different composition of the two samples. It would also be expected that differences in the percentages of the two groups having at least one working episode would narrow after wave one. This is because the work patterns in the Population Reference group should not vary greatly over time, whereas the labour market performance of the Jobseeker group should, to the extent that work experience has a cumulative effect on subsequent labour market success, improve over time. The changes expected are evident in the wave two data. Thus, the percentage of the Population Reference group with at least one working episode does not change appreciably between waves one and two while it rises by ten percentage points for the Jobseeker group.

Percentage with at least one  
working episode continued

However, the percentage figures do not converge further when the wave three data are examined. This could be suggestive of a core of the long-term unemployed among the Jobseeker group.<sup>1</sup>

Average number of working  
episodes

Among those with at least one working episode, the difference between the Jobseeker and Population Reference groups in the average number of working episodes is relatively small. However, this mean figure masks some interesting aspects of the distribution of working episodes that are revealed in table 2.2. For the Population Reference group, the mean number is 1.3 in each survey wave. This stability is a reflection of the randomness of the sample. Among Jobseekers, however, the mean number of episodes for groups with at least one working episode drops from 1.7 to 1.5 between waves one and two and remains at 1.5 in wave three. Again, a core of long-term unemployed could explain this feature of the Jobseeker sample.

The duration of work

The duration of working differs considerably between the Jobseeker and Population Reference groups, and this is most likely due to the considerable 'specialist' job search being undertaken by the Jobseeker group.<sup>2</sup> In 1995 a Jobseeker worked, on average, 52 days compared to 267 days for a typical worker. A feature of the duration data is that the number of days the typical Jobseeker spent working in the reference period increased each wave. During the first wave it was 52 days, in the second wave it was 121 days and in the third wave it was 182 days. The table 2.1 data are therefore suggestive of a situation where, with additional years of labour market activity, an increasing number of Jobseekers obtain jobs that last for longer periods. The lower mean duration of the jobs obtained by Jobseekers in wave three compared to the mean duration of the jobs obtained by the Population Reference group (182 days compared to 276 days), and the greater number of separate working episodes of the Jobseekers in wave three compared to that of the typical member of the Population Reference group, are matters of concern, as they suggest that the labour market adjustment of Jobseekers is very slow.

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1 24% of the Jobseekers spent all of wave one looking for work while not working, 17% were in a similar situation in wave two and 16% in wave three. 10% of the Jobseekers spent both waves one and two looking for work while not working; 9% spent waves two and three looking for work while not working; and 6% spent all three waves looking for work while not working. Note that these percentage figures have been calculated using the largest samples possible in each case (see table 3.1 for further details).

2 Specialist job search refers to looking for work while not working. See Le and Miller (1999) for further details.

*Distribution of workers across working episodes*

The distributions of individuals from the Jobseeker and Population Reference groups across working episodes are presented in table 2.2. These data are restricted to individuals having at least one working episode. Overall, the table 2.2 data show that compared to the Population Reference group, there is, across all survey waves, a higher proportion of Jobseekers who had more than one working episode. For example, in each wave, at least 22% of Jobseekers who had worked had two working episodes, compared with 17% for the Population Reference group. This suggests there is considerable job churning among the Jobseekers and that the churning phenomenon takes a considerable length of time to dissipate.

**2.2** PERCENT DISTRIBUTION OF POPULATION REFERENCE AND JOBSEEKER GROUPS ACROSS EPISODES OF WORK, 1995–1997(a)

<i>Episodes</i>	<i>Population Reference group</i>			<i>Jobseeker group</i>		
	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>
1	78.6	75.5	76.0	54.0	64.6	69.0
2	16.7	18.3	17.7	30.8	23.7	22.2
3	3.4	4.7	4.5	10.2	7.9	5.6
4 or more	1.3	1.5	*1.8	5.0	3.8	3.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<i>Sample size</i>	1 845	1 742	1 605	3 171	3 211	2 815
<i>Weighted estimates ('000)</i>	8 966.6	9 198.8	9 139.1	507.8	596.1	582.8

(a) Data restricted to persons having at least one working episode.

*Cross-tabulation of working episodes*

A further way of looking at the data is to cross-classify the number of working episodes (including none) in one wave by the number of working episodes in another wave. Table 2.3 provides such a cross-classification, permitting insights into whether, as suggested above, some individuals are excluded from work and hence possibly form a core of long-term unemployed. It also shows whether the individuals experiencing a high number of episodes of work in one year are similarly placed in an adjacent year. Where labour markets are characterised by inertia (see, for example, Nakamura & Nakamura 1985) it would be expected that the number of episodes of work would be positively correlated over time.

The table 2.3 data provide information on three aspects of the labour market.<sup>3</sup> The first aspect is the extent to which the labour market is characterised by inertia. This is revealed from inspection of the percentage figures in the main diagonal. The second aspect relates to whether an individual's labour market performance improves over time. Labour market performance could be regarded as having improved where the number of jobs held was reduced. Information on this aspect of the labour market patterns is contained in the lower off-diagonal cells in the table for all groups. The third dimension of the labour market on which table 2.3 informs is the extent to which the labour market performance of some groups deteriorates or becomes unstable over time. In this case, instability in labour market performance is defined as a situation where the number of jobs held rises over time. For example, individuals who had one job that lasted for three months in one period and four jobs that each lasted for three months in the following period, would be categorised as experiencing job instability. Although the individuals spent, in total, more time working in the second period, job instability is argued to arise because these workers are unable to remain in a job for an extended period of time. Therefore, it is not the total time spent working *per se* but the extent to which individuals change jobs that is of concern. The upper off-diagonal percentage figures provide information on deterioration or instability in labour market performance.

## 2.3 PERCENT DISTRIBUTION OF POPULATION REFERENCE AND JOBSEEKER GROUPS ACROSS EPISODES OF WORK

		<i>Episodes of work Wave 3 (1997)</i>				
<i>Episodes of work Wave 2 (1996)</i>	1	2	3 or more	<i>Did not work</i>	<i>Proportion of total</i>	
POPULATION REFERENCE GROUP						
1	80.8	11.2	3.3	4.7	62.8	
2	51.6	34.6	10.5	*3.3	15.3	
3 or more	30.2	35.3	32.3	*2.3	5.2	
Did not work	15.4	*3.1	0.0	81.5	16.8	
<b>All persons</b>	<b>62.8</b>	<b>14.6</b>	<b>5.3</b>	<b>17.3</b>	<b>100.0</b>	
JOBSEEKER GROUP						
1	62.1	16.6	3.4	17.8	44.0	
2	52.8	26.8	11.1	9.3	16.2	
3 or more	42.3	25.3	27.7	*4.7	7.9	
Did not work	20.8	*3.5	*1.1	74.7	31.9	
<b>All persons</b>	<b>46.0</b>	<b>14.8</b>	<b>5.8</b>	<b>33.4</b>	<b>100.0</b>	

<sup>3</sup> Due to the small numbers in most cells, working episodes above two have been collapsed into one category, '3 or more'.

*Labour market performance of the  
Population Reference group*

With respect to the Population Reference group, the percentage figures (from the main diagonal) suggest that labour market performance is characterised by inertia. For example, 82% of individuals who did not work in 1996 also did not work in 1997. There is also a relatively high percentage (81%) of individuals with one working episode in the 1996 reference period who had a single working episode in the 1997 reference period. Labour market inertia is also observed for those with a high number of jobs.

Data from the lower off-diagonal cells suggest an improvement in labour market performance between 1996 and 1997 for some members of the Population Reference group. For example, 52% of the workers who had two episodes of work in 1996 had only one episode of work in the following year and 65% of workers with three or more episodes of work in 1996 experienced a smaller number of working episodes in 1997.

The data from the upper off-diagonal cells suggest a deterioration in labour market performance for other workers. For example, 11% of the workers who had one working episode in 1996 had two working episodes in the following year, and 11% experienced an increase in the number of jobs held in the reference period from two to three or more. Another feature of the labour market activity of the general population is that the percent of workers who did not work in 1997 is quite small, ranging from 2% to 5%.

*Labour market performance of  
Jobseekers*

With regard to the Jobseeker group, the classification of individuals across working episodes yields several important results. First, similar to the Population Reference group, the labour market outcomes of Jobseekers are characterised by inertia. For example, 75% of Jobseekers who did not work in 1996 were similarly placed in the following year. Similarly, about two-thirds of the Jobseekers who had one job in 1996 also had one job in 1997. Second, there appears to be an improvement in labour market outcomes, as measured by apparent job stability, for individuals with more than one job in 1996. For example, half of those who had two episodes of work in 1996 had only one episode of work in 1997. Third, the extent to which the labour market outcome deteriorated appears to be relatively high among some groups of Jobseekers. For example, 17% of Jobseekers with one job in 1996 had two jobs in 1997, and 11% experienced an increase in the number of jobs held from two to more than two over the same period. Fourth, there is a relatively high percentage of Jobseekers who shift away from work over time. For example, 18% of Jobseekers who had one episode of work in 1996 did not work in the subsequent year, and 9% who had two jobs in 1996 did not work in 1997.

Overall, the labour market stability of Jobseekers differs from that of members of the Population Reference group in at least three major ways. First, job turnover is higher among Jobseekers, particularly with respect to the transition from one to two jobs. For example, 17% of Jobseekers experienced an increase in the number of episodes of work from one to two between 1996 and 1997, compared to 11% of the Population Reference group. Second, a lower proportion of Jobseekers experienced a reduction in the number of episodes of work over the period under review compared to the Population Reference group. For example, 25% of Jobseekers who had three or more episodes of work in 1996 had only two episodes of work in 1997 compared to 35% for this transition among the Population Reference group. Third, there is a higher percentage of Jobseekers than of the Population Reference group who shift away from work over time. For example, the percentages of Jobseekers who had one or two jobs in 1996 but who did not work in 1997 are more than double the comparable percentage figures from the Population Reference group.

#### CONTROLLING FOR EDUCATIONAL ATTAINMENT

The data reviewed in tables 2.1 to 2.3 are aggregated over all individuals in the Population Reference and Jobseeker groups. The patterns in these data are particularly striking, and have been used to infer both economic disadvantage and improvement in labour market stability over time. In this respect it is of interest to examine whether labour market success and failure, as measured by the number of jobs held in a given period, is correlated with the usual indicators of labour market advantage, such as educational attainment.<sup>4</sup> Tables 2.4 and 2.5 list data on the distributions of the Population Reference and Jobseeker groups across working episodes that have been disaggregated by educational attainment.

*Educational attainment and labour  
market performance, Population  
Reference group*

For the Population Reference group, the table 2.4 data suggest a correlation between labour market stability and educational attainment in any given year.<sup>5</sup> Thus, comparing the distribution of workers at each of the two educational attainments across working episodes in 1996, one-quarter of the early school leaver group did not work at all, which is a much higher representation than the 11% of the better educated group. 66% of the people in the higher levels of educational attainment had only one episode of work, compared to 59% of the people who left

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<sup>4</sup> Other influences on labour market outcomes that could be examined in this context include age, English proficiency and birthplace.

<sup>5</sup> In 1997 66% of members of the Population Reference group are classified as having a high level of education in the table 2.4 data, while 56% of Jobseekers are similarly classified in the table 2.5 data.

school before they completed high school. The percentage representations in the other two working episode categories are similar for early school leavers and the better educated.

## 2.4 PERCENT DISTRIBUTION OF THE POPULATION REFERENCE GROUP ACROSS EPISODES OF WORK BY EDUCATIONAL ATTAINMENT

<i>Episodes of work Wave 3 (1997)</i>					
<i>Episodes of work Wave 2 (1996)</i>	<i>1</i>	<i>2</i>	<i>3 or more</i>	<i>Did not work</i>	<i>Proportion of total</i>
LOW LEVEL OF EDUCATION(a)					
1	81.4	10.1	*2.8	*5.7	58.7
2	60.1	27.1	*8.4	*4.5	13.1
3 or more	*26.5	46.4	*17.6	*9.4	*4.6
Did not work	*9.4	*0.8	0.0	89.8	23.6
<b>All persons</b>	<b>59.1</b>	<b>11.5</b>	<b>*3.5</b>	<b>25.9</b>	<b>100.0</b>
HIGH LEVEL OF EDUCATION(b)					
1	80.8	11.9	*3.4	*3.9	66.3
2	47.1	38.5	11.6	*2.8	16.6
3 or more	31.4	31.5	37.1	0.0	5.7
Did not work	21.8	*6.1	0.0	72.1	11.4
<b>All persons</b>	<b>65.7</b>	<b>16.7</b>	<b>6.3</b>	<b>11.4</b>	<b>100.0</b>

(a) Low level of education includes individuals who left school at 15, 16, 17 or 18 years of age and had not completed the highest level of secondary school, or those who had not attended school.

(b) High level of education includes individuals who had attended the highest level of secondary school or possess a post-secondary qualification.

Examination of the labour market dynamics between 1996 and 1997 reveals two broad patterns. First, for each episode of work category in 1996, there is a higher percentage of individuals with a low level of education who did not work in 1997 compared to those with a high level of education. This feature is particularly noticeable among individuals who did not work in 1996: 90% of those with a low level of education in this category in 1996 did not work at all in the following year, compared to only 72% of those with a high level of education. Second, there is some superficial evidence of increased stability in the labour market performance of the less-well educated between 1996 and 1997 compared to the changes evident among the better educated. By way of example, consider the workers who had two episodes of work in 1996. Some 60% of workers who have a low level of education had only one episode of work in 1997 compared to 47% of workers with a high level of education. This apparent change between 1996 and 1997 is felt to be superficial as it is inconsistent with the positive link between educational attainment and employment stability described above. At this

stage, it is unclear as to what is the reason for the difference in the patterns in the episodes of work data between educational attainments for a single year and across years. The most obvious reason is that it reflects sampling error.

Educational attainment and labour  
market performance, Jobseekers

The table 2.5 data suggest that Jobseekers with a low level of education are less likely to work at all than are the better educated. Moreover, the less-well educated who did not work in one year are also more likely to be in the same status in the following year than is the case among the better educated. For example, 81% of Jobseekers with a low level of education who did not work in 1996, did not work in the following year, compared with only 68% of those with a high level of education. The percentage representation of the less-well educated in the 'did not work' category in 1997 is greater for all the 1996 episode of work categories listed in table 2.5. In this respect the finding is suggestive of a strong empirical link between educational attainment and labour market performance.

## 2.5 PERCENT DISTRIBUTION OF THE JOBSEEKER GROUP ACROSS EPISODES OF WORK BY EDUCATIONAL ATTAINMENT

		<i>Episodes of work Wave 3 (1997)</i>				
<i>Episodes of work Wave 2 (1996)</i>	<i>1</i>	<i>2</i>	<i>3 or more</i>	<i>Did not work</i>	<i>Proportion of total</i>	
LOW LEVEL OF EDUCATION(a)						
1	59.0	16.7	*3.4	20.9	42.3	
2	48.7	27.3	*9.2	*14.8	14.2	
3 or more	34.9	*26.2	*29.9	*9.0	6.4	
Did not work	15.0	*2.9	*1.0	81.1	37.1	
<b>All persons</b>	<b>39.7</b>	<b>13.7</b>	<b>5.0</b>	<b>41.6</b>	<b>100.0</b>	
HIGH LEVEL OF EDUCATION(b)						
1	64.6	16.5	*3.6	15.3	45.6	
2	55.6	26.6	12.3	*5.5	17.8	
3 or more	46.7	25.1	26.7	*1.5	9.2	
Did not work	26.9	*4.1	*1.2	67.8	27.4	
<b>All persons</b>	<b>51.1</b>	<b>15.7</b>	<b>6.5</b>	<b>26.7</b>	<b>100.0</b>	

(a) Low level of education includes individuals who left school at 15, 16, 17 or 18 years of age and had not completed the highest level of secondary school, or those who had not attended school.

(b) High level of education includes individuals who had completed the highest level of secondary school or possess a post-secondary qualification.



*Improvement in labour market  
performance for Jobseekers*

With regard to improvements in labour market performance, there are several key features of the table 2.5 data. First, among those who did not work in 1996, there is a higher percentage of the better educated than of the less-well educated who were working in 1997. The comparable percentage figures for those who did not work in 1996 and had one episode of work in 1997 are 27% and 15%, for those with a high level of education and a low level of education, respectively. Second, among those who worked in 1996, a smaller percentage of the better educated than of the less-educated group did not work in the following year. Third, the better educated who worked in both 1996 and 1997, on average, are more likely to experience a reduction in the number of episodes of work than are the group of early school leavers. These data are suggestive of stronger growth in employment stability among the better educated than among those who left school prior to completing high school.

It is noted that the table 2.5 data for Jobseekers are consistent in terms of the patterns established in a single year and across years. That is, in any given year individuals whose minimum level of education was the completion of high school are more likely, on average, to work and to have only a single episode of work than those who left school prior to the completion of high school. They are also less likely to exhibit a transition from 'work' to 'absent from work' between 1996 and 1997 and are more likely to exhibit improvements in job stability, as evidenced by a reduction in the number of working episodes among those who worked.

*Comparison of labour market  
performance*

A comparison of labour market performance between the Population Reference and Jobseeker groups at each educational attainment suggests that Jobseekers, both the better educated and the less-well educated, are disadvantaged in the labour market. This disadvantage applies in the case of both comparisons within a single year (1996 or 1997) and of labour market mobility between years. For example, in 1996, 37% of Jobseekers who left school prior to the completion of high school did not work, compared to 24% of the Population Reference group. Among those whose minimum educational attainment was the completion of high school the percentages of Jobseekers and the Population Reference group that did not work in 1996 are 27% and 11%, respectively. With respect to the mobility between 1996 and 1997, the data in tables 2.4 and 2.5 reveal that Jobseekers experienced greater labour market instability than the Population Reference group. For example, among Jobseekers with a low level of education, 20% of those with one episode of work in 1996 had two or more episodes of work in 1997 compared to 13% for the Population Reference group. Among those with a high level of education, the comparable percentage figures for Jobseekers and the Population Reference group are 20% and 15%, respectively.

## Summary

Overall, more Jobseekers experienced labour market instability than did typical workers. However, the brief review of the number of episodes of work and of the labour market transitions data suggests that the disadvantage in the labour market faced by both Jobseekers and members of the Population Reference group can be reduced through the acquisition of additional education. These data also suggest that the labour market disadvantage experienced by Jobseekers compared to the Population Reference group is reduced over time among the better educated (due to relatively strong improvements in labour market stability among Jobseekers). This reduction in labour market disadvantage does not appear to carry over to the less well educated.

## CASE STUDY OF JOBSEEKERS

The discussion to date has focused on analysis of data presented at a high degree of aggregation. It has demonstrated that many individuals, particularly among the Jobseeker group, experience more than one job during any given year. In other words, there is considerable instability in the labour market experiences of many individuals. The implications of this for policy, and the way that it needs to be addressed in research, are not readily apparent from the aggregate-level analysis. An alternative approach that has the potential to offer guidance in this regard is to follow the labour market activity of a number of randomly selected individuals from the Jobseeker group over time. This case study approach will provide information on the transitions into and out of jobs, the duration of each job and the total number of jobs for five individuals. Five cases are used to illustrate the diversity of labour market outcomes for members of the Jobseeker groups. However, for confidentiality reasons, only summary data on the five Jobseekers will be presented.

Overall, the labour market patterns for the five Jobseekers reveal that they experienced considerable job instability. Each of these Jobseekers had at least one episode of work and one episode of looking for work. The typical labour market pattern experienced by the Jobseekers between 1995 and 1997 would be a long spell of specialist job seeking followed by a number of episodes of work. For example, some Jobseekers spent all of waves one and two looking for work while not working. Once a job was obtained, it generally ended within a short period of time, and was followed by a further period of job seeking which varied appreciably in length (from one day to three months in the episodes of job search examined). In the five cases examined, the longest period of employment was around 300 days, though some jobs lasted only two weeks. One of the reasons for the short duration of employment is that the jobs were generally temporary or seasonal. Other reasons given for leaving the job include unsatisfactory work arrangements, pay or hours worked, and that the Jobseeker was either retrenched or the company went out of business. The jobs were obtained through a variety of means, including

newspaper advertisements, by contacting friends, relatives or through company contacts. There does not seem to be any obvious link between the method of job search that led to the job and the duration of the job.

Most of the Jobseekers spent a considerable time absent from the labour market. The five Jobseekers analysed in detail were absent from the labour market between 118 and 241 days during the three-year period.

*Summary*

In summary, Jobseekers generally have a number of periods of work interspersed with periods of job seeking while not working of various durations. Rarely was there evidence in the case studies undertaken of substantial improvement over time in job stability. Jobseekers appear to have two difficulties: they have difficulties finding work, and they have difficulties staying in a job for a reasonable length of time. The short mean duration of the typical job acquired by a Jobseeker has not been emphasised in the unemployment debate, rather the debate has generally concentrated on the difficulties individuals experience finding work. The short period of time for which many jobs are held could be due to the characteristics of the individual concerned. Or it could be due to the characteristics of the jobs that these individuals find.

As indicated, the jobs obtained were often temporary or seasonal. The factors contributing to the high job turnover will therefore be important to understanding the labour market performance of Jobseekers. The remainder of this study addresses this issue from the perspective of an examination of the links between job quality and labour market churning.

## SECTION 3

## OCCUPATION AND JOB QUALITY

Two broad approaches to the study of occupational outcomes have been followed in the literature. The first involves study of the occupational distribution at a fairly broad level of aggregation (e.g. Kidd & Meng 1997). Cross-tabulations and probability models are generally employed. The second approach involves analysis of the indices of occupational prestige that can be assigned to detailed occupational data (e.g. Evans 1987; Jones 1989). Both approaches are followed here. The plan of the analysis is as follows. First, in this section basic descriptive details on the occupational distributions of Jobseekers are provided using both a listing of occupational distributions at a broad level of aggregation and a measure of the socioeconomic status of the occupation. In each instance comparative data from a random sample of workers are also provided as a benchmark. Second, in sections 4 and 5 individuals who are in good and poor jobs are identified, using two alternative methods of classifying jobs, namely a model of occupational status based on a measure of occupational status attainment (section 4) and a probability model of occupational choice (section 5). The subsequent labour market patterns of individuals with good and poor jobs are then examined in section 6 with a view to establishing whether individuals in jobs categorised as of poor quality are more likely to be part of the churning phenomenon.

### ASPECTS OF THE SEUP DATA

The aim of this section is to provide information on the types of jobs that Jobseekers are gaining entry into, and to establish how different these jobs are from the types of jobs held by the typical worker. To achieve this it is first necessary to determine an appropriate occupation classification and a suitable reference point to make maximum use of the data.

*Australian Standard Classification  
of Occupations*

The SEUP contains information on two versions of the Australian Standard Classification of Occupations (ASCO). The ASCO is a skilled-based classification of all occupations in the Australian workforce. The first version of the ASCO was released in 1986 and the second was released in mid-1996. The second version of the ASCO was introduced to take account of the structural changes (e.g. industry and award restructuring, technological change and competency-based approaches to career entry and progression) in the labour market since 1986 (ABS 1997b).

The ASCO version one comprises eight major groups, 52 minor groups, 282 unit groups, and 1,079 occupations at the most disaggregated level (ABS 1990). The ASCO version two comprises nine major groups, 35 sub-major groups, 81 minor groups, 340 unit groups and 986 occupations. According to the ABS (1997b, pp. 8–9), “The method adopted in ASCO Second Edition was to assign each of the major groups in ASCO Second Edition to one of five broad skills levels.....The criteria used in ASCO Second Edition to measure skill level are formal education and/or

training and previous experience usually required for entry to the occupation.” Hence the occupational hierarchy can be thought of as being ordered in terms of skills. For this reason the second edition of the ASCO is used in this analysis.

*Jobseeker sample*

To provide background on the data on occupations in the SEUP, the occupational distributions of the Jobseeker and Population Reference groups are reviewed using cross-tabulations of the most aggregated occupation data available. As noted in section 2, the Jobseeker group comprises some individuals who were underemployed at the time of recruitment, hence some of the Jobseekers may have been employed (*albeit* underemployed) for some time. Given the focus in the study on the links between job quality and churning in the pool of unemployment, the jobs of all Jobseekers are of interest.

*The reference point*

In studying the occupation data a reference point needs to be established. Jobs obtained up to the reference point will be examined for job quality, and the labour market patterns beyond this reference point will be used to establish links between job quality and churning in the labour market. This reference point needs to be chosen in a way that will make maximum use of the data. Two considerations are important. First, a sufficiently long period of time must be allowed for an adequate number of Jobseekers to obtain employment. Second, sufficient time must be allowed to permit the success of the job match to be evaluated.

Table 3.1 shows the number of Jobseekers having at least one job in each of the three waves as well as the number of individuals lost from each wave. From this table, the percentages of Jobseekers who had at least one job in the first, second and third waves are 58%, 67% and 66%, respectively. However, these percentages are computed on a decreasing Jobseeker sample.

### 3.1 NUMBER OF JOBSEEKERS WHO WORKED, 1995–1997

	Wave 1	Wave 2	Wave 3
Initial sample size	5 488	5 488	5 488
Number lost from the sample due to attrition	0	709	1 227
Effective sample size	5 488	4 779	4 261
Sample number who had worked in the wave	3 171	3 211	2 815
Proportion who had worked in the wave (%)	57.8	67.2	66.1
<i>Weighted estimates of number who had worked in the wave ('000)</i>	507.8	596.1	582.8
<i>Weighted estimates ('000)</i>	875.1	875.1	875.1

#### *Defining first job*

In empirical analyses large samples are preferred because the data are more representative of the relevant population. Given sample loss due to attrition in waves two and three, wave one data will be used in this segment of the study.<sup>1</sup> This gives the maximum number of observations for empirical analyses. The occupation data for the Jobseeker group are therefore collated with respect to jobs (i.e. working episodes) that started on or before September 3 1995. If the Jobseeker had more than one job during the first wave then the first job is selected.<sup>2</sup> This decision provides a relatively large sample for use in the study of occupational attainment (and one that would be increased only marginally by extending the cut-off period) and provides a lengthy period of time over which the success of the job match can be examined.

#### *Defining last job*

The occupation data for the Population Reference group are used as a benchmark set of data in this study. To maximise the relevance of the comparisons made, the time period for which the occupation data for the comparison group are collected needs to be as close as possible to the time periods covered by the jobs held by the majority of members of the Jobseeker sample. Moreover, in order to avoid estimating on a decreasing sample, only wave one data are again used in this section of the study.<sup>3</sup> With this in mind, the occupational distributions are compiled using data on jobs that started on or before June 1 1995 and had continued after this date.<sup>4</sup> If individuals from the Population Reference group had more than one job during the focus period then the last job held is selected. Using this algorithm for constructing the occupational distributions, 71% of the sample have valid data.

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1 Data from waves one, two and three are used in the study of job durations in sections 6 and 7.

2 This includes jobs held by individuals before they were identified as Jobseekers as well as jobs held by Jobseekers after the May 1995 recruitment (i.e. after they were identified as Jobseekers). An alternative approach that selects jobs held after the recruitment made little difference to the overall distribution of Jobseekers across occupations.

3 The wave one–wave two attrition rate is 8.3% and the wave two–wave three attrition rate is 6.5% (Le & Miller 1998).

4 The aim here is to establish the occupational distribution for the Population Reference group at a point in time. Accordingly, a single point in the reference period needs to be chosen. Given the decision to select the first working episode of members of the Jobseeker group in cases of multiple working episodes, a period prior to 3 September 1995 seems to be in order. For the Population Reference group 1 June 1995 was used as the focus date, though it needs to be noted that this choice is essentially arbitrary. This particular choice does not appear to impact on the analysis.

## THE OCCUPATIONAL DISTRIBUTIONS OF THE JOBSEEKER AND POPULATION REFERENCE GROUPS

In this subsection, the distribution of the Jobseeker and Population Reference groups across occupations will be discussed for both males and females. The data on the occupational distributions for these groups are presented in table 3.2.

### 3.2 OCCUPATIONAL DISTRIBUTION BY SEX, POPULATION REFERENCE AND JOBSEEKER GROUPS—1995

Occupation	Population Reference group			Jobseeker group		
	Male	Female	Total	Male	Female	Total
	%	%	%	%	%	%
Managers and administrators	9.9	4.3	7.4	1.7	1.0	1.4
Professionals	13.7	18.2	15.6	6.3	9.0	7.4
Associate professionals	12.3	10.9	11.7	6.9	5.1	6.2
Tradespersons and related workers	25.3	2.7	15.4	19.8	3.7	13.0
Advanced clerical and service workers	0.1	8.2	3.7	0.2	3.7	1.7
Intermediate clerical, sales and service workers	6.7	28.9	16.4	7.3	30.6	17.0
Intermediate production and transport workers	13.5	3.4	9.1	18.1	4.4	12.4
Elementary clerical, sales and service workers	5.9	15.2	10.0	8.8	23.6	15.0
Labourers and related workers	12.6	8.2	10.7	30.9	18.9	25.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<i>Weighted estimates ('000)</i>	4 395.3	3 455.3	7 850.6	289.7	209.7	499.4

#### *Main occupations for Population Reference group*

With regard to the Population Reference group, several features of the occupational distribution can be observed from table 3.2. First, nearly one-half of the individuals are employed in just three occupations. Thus, 16% are employed as intermediate clerical, sales and service workers, a further 16% are employed as professionals and 15% are employed as tradespersons and related workers. Second, the occupational distribution for males is different from that for females. In particular, most male workers are employed as tradespersons and related workers (25%), professionals (14%) or intermediate production and transport workers (14%). In comparison, females have typically obtained work as intermediate clerical, sales and service workers (29%), professionals (18%), or elementary clerical, sales and service workers (15%).

#### *Main occupations for Jobseekers*

Within the Jobseeker group, three occupations, namely labourers and related workers, intermediate clerical, sales and service workers, and elementary clerical, sales and service workers, account for over one-half of total employment. Similar to the pattern established for individuals from the Population Reference group, there exists a male/female differential in the occupational distributions of the Jobseeker group. For example, male workers are typically employed as labourers and related workers (31%), tradespersons and related workers (20%) or intermediate

*Main occupations for Jobseekers  
continued*

production and transport workers (18%). In contrast, most of the jobs obtained by female Jobseekers are as intermediate clerical, sales and service workers (31%), elementary clerical, sales and service workers (24%) or labourers and related workers (19%).

*Comparison of occupational  
distributions*

The table 3.2 data also reveal several interesting differences between the types of jobs obtained by Jobseekers and the types of jobs held by members of the Population Reference group. In particular, the Jobseekers are generally employed as labourers and related workers. These jobs appear to be inferior to those held by individuals from the Population Reference group who are typically employed as intermediate clerical, sales and service workers or as professionals. The specific details on this differential in job quality differ between males and females.

*Males*

Within the male sample several patterns can be observed. First, a relatively low percentage of male Jobseekers have obtained employment as managers and administrators (2%), or professionals (6%). In comparison, 10% and 14% of males from the Population Reference group are employed in managerial and administrative or professional occupations, respectively. Second, a high percentage of the male Jobseekers are employed as labourers and related workers (31%), and this representation is considerably higher than the 13% of males from the Population Reference group who are employed in the same occupation.

*Females*

Within the female sample, the types of jobs held by Jobseekers are generally inferior to those held by members of the Population Reference group. For example, the percentage of females from the Jobseeker group who are employed in professional occupations is half that of the Population Reference group who work in the same occupation. Moreover, the representation of female Jobseekers in the labourers and related workers occupation is more than double that of the Population Reference group, while female Jobseekers have more than one and a half times the representation of the Population Reference group in the elementary clerical, sales and service workers occupations.



## THE DUNCAN INDEX OF DISSIMILARITY

A useful summary measure of the difference in occupational outcomes between the Jobseekers and the Population Reference group is provided by the Duncan index of dissimilarity (Duncan & Duncan 1955). The Duncan index of dissimilarity can be expressed as

$$D = \frac{1}{2} \sum_{k=1}^K |x_k - y_k| \quad (1)$$

where  $k$  is the occupational group ( $k = 1, 2, \dots, K$ ), and  $x_k$  and  $y_k$  are the proportions of the Jobseeker and Population Reference groups in occupation  $k$ , respectively. This index can be interpreted as the proportion of the Jobseekers who would have to change their occupation to achieve the same occupational distribution as the Population Reference group.<sup>5</sup>

*Duncan indices for occupational distribution*

The Duncan index of dissimilarity is computed separately for males and females. The values of the index for males and females are 26.5% and 22.8%, respectively. Therefore, 27% of male Jobseekers and 23% of female Jobseekers would have to shift to a different occupation to balance the occupational distributions of Jobseekers and the Population Reference group.

However, the Duncan index of dissimilarity is sensitive to the number of separate occupations used in the calculation. For example, the table 3.2 data show that among males 20% of Jobseekers and 25% of the Population Reference group are employed in trades and related work. However, within this occupational group there are considerable differences between the sub-major groups. For example, there is at least a nine percentage point difference between individuals from the Population Reference group and Jobseeker groups employed as electrical and electronics tradespersons, or as construction tradespersons. As a summary of the extent of the differences between the distributions of workers across sub-major groups within this occupation, the Duncan index was calculated for the trades and related workers occupation. The value of the index for this particular occupation is 15.6%. This indicates that there are large differences in the distributions of workers within each major group. Hence, all the occupation data were examined at the sub-major group level and the Duncan index of dissimilarity computed for these groups. In this instance (35 sub-major groups) the values of the Duncan index were 31.2% and 30.8% for males and females, respectively.

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<sup>5</sup> Alternatively, the index can be interpreted as the proportion of the Population Reference group that would have to shift across occupations to achieve the same occupational distribution as Jobseekers. Further information on the index, including its limitations and extensions, can be found in Karmel & MacLachlan (1988).

Overall, there are quite marked differences between the occupational distributions of Jobseekers and the Population Reference group. Jobseekers are obtaining jobs that are, on average, inferior to the jobs held by members of the Population Reference group. A measure of the 'general goodness' of jobs that may be useful in assessing the differences in the quality of the jobs held by these groups may be provided by the ANU index of socioeconomic status.

## THE ANU3 INDEX OF SOCIOECONOMIC STATUS

The second approach used in the study of occupational outcomes is to base the analysis on the ANU3 measure of socioeconomic status. This measure has its origin in the prestige ratings of occupations developed in ANU1 and ANU2 (Broom, Duncan-Jones, Jones & McDonnell 1977; Jones 1988). The ANU3 scale was developed by Jones (1989). It uses the ASCO version one codes, which as noted earlier have a focus on skill and skill specialisation. The ANU3 scale measures relative differences in labour market power, occupational prestige, occupational requirements and occupational rewards. The scale ranges from a low of zero to a high of one hundred points. By way of example, the score for toolmakers, inspectors and regulatory officers, production recording clerks, other clerks, sales assistants, tellers and glass production machine operators is 25, that for other specialist managers, other para-professionals, registered nurses, and securities and finance dealers is 50, and that for data processing managers and mining engineers is 75.

The ANU3 scale, however, is not strictly equivalent to a prestige scale. Therefore, care should be taken when using this index as a strict measure of socioeconomic status of the job. This occurs because some occupational groups (e.g. dancers, writers, painters) enjoy a social standing higher than their socioeconomic status would suggest, while the opposite is true for other occupations (e.g. chiropractors). Jones (1989) suggests that the ANU3 index should be used to complement other aspects of occupational differences (e.g. firm size, industrial sector, region, the degree of freedom and supervision that different workers exercise during their employment).

### *Creating an ANU3 index*

The ANU3 scale is available for major, minor and unit groups. In this study, the ANU3 scale is used for unit groups. As we are using ASCO version two occupations and the ANU3 scale is based on ASCO version one, the ASCO version two codes need to be mapped onto the ASCO version one codes for each unit group.<sup>6</sup> In most cases there is a

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<sup>6</sup> We are grateful to Frank Jones for advice on the procedure used to derive a measure of socioeconomic status for the ASCO version two unit groups (Jones, personal communication 19 August 1998).

one-to-one mapping of the two ASCO codes. Where the ASCO version two codes can be mapped onto more than one ASCO version one code, they are coded to the unit group that has the highest level of concentration (e.g. ASCO version two code 2291 is split between ASCO version one codes 2705 and 2799. The cross-tabulation shows ASCO version one codes 2705 and 2799 account for 91% and 9% of the sample, respectively. Hence, ASCO version two code 2291 is matched to ASCO version one code 2705). As a 'rule of thumb', the ASCO version two code is matched to the relevant ASCO version one code that accounts for at least 80% of the sample. Where the occupational distribution is more uniform across unit groups, the average of the ANU3 scores for the relevant unit groups is taken.<sup>7</sup>

Mean values of ANU3 score

The mean values of the ANU3 scale for the Jobseekers and the Population Reference group are given in table 3.3. It can be seen that Jobseekers occupy jobs that have, on average, lower occupational prestige than members of the Population Reference group. In particular, the value of the ANU3 scale for the Jobseeker group is 22, compared to a mean score of 32 for the Population Reference group. Typical occupations with scores of around 22 are structural steel, boilermaking and welding tradespersons, sports persons and related workers, other labourers and related workers, and drilling plant operators. In comparison, typical occupations with scores of around 32 are performing arts support workers, other tradespersons, and street vendors, canvassers and sales drivers.

The large differential in the occupational prestige score for the Jobseeker and Population Reference groups carries across to separate analyses conducted for males and females. Thus, male and female Jobseekers have ANU3 scale values of 11 and 8 points, respectively, lower than those of males and females from the Population Reference group.

### 3.3 MEAN VALUES OF THE ANU3 SCALE FOR THE POPULATION REFERENCE AND JOBSEEKER GROUPS

Mean	Population Reference group			Jobseeker group		
	Male	Female	Total	Male	Female	Total
ANU3	32.1	32.6	32.3	20.8	24.6	22.4
Sample size	858	747	1 605	1 778	1 346	3 124
Weighted estimates ('000)	4 395.3	3 455.3	7 850.6	289.7	209.7	499.4

<sup>7</sup> Experiments show that the scale constructed is robust to reasonable alternative assumptions being made in cases where there is not a one-to-one mapping.

### *Summary*

Overall, both approaches used in the study of occupational outcomes indicate that Jobseekers have jobs that are inferior to those held by the Population Reference group. The disadvantage experienced by Jobseekers in the labour market may be affected by a number of factors. Hence, the relationships between occupation and personal, regional, family and job characteristics will be examined in sections 4 and 5 in the context of a multivariate analysis. This analysis will help establish whether Jobseekers are being disproportionately channelled into inferior jobs. If this is the case then the difficulties that they face securing jobs that are appropriate, given their qualifications, may contribute to the instability in labour market performance documented in section 2.

## SECTION 4

### ANALYSIS OF OCCUPATIONAL STATUS

A person's occupation is a very good indicator of economic and social well-being. Occupations such as professionals are high-paying and high-prestige while other occupations, such as labourers, are relatively low-paying and low prestige. It has been noted above that there are major differences in the representation of the Jobseeker and Population Reference groups in the various occupations. Whether these differences are justifiable, however, depends on the mechanism through which individuals find jobs and advance within those jobs. In this regard, Australian researchers (e.g. Kidd & Meng 1997; Evans 1987) have argued that productivity-related characteristics, such as educational attainment and labour market experience, have major influences on occupational attainment. Accordingly, to ascertain whether a group of workers is underachieving in terms of their distribution across occupations, one needs to know the characteristics of the workers and the way that these characteristics feed into occupational success. The links between occupational attainment and worker characteristics can be determined in several ways. Two are utilised in this study. The first, to be presented in this section, is a model of occupational status that follows the approach of Evans (1987). The second, presented in the next section, is an ordered probability model of occupational outcomes that follows Miller and Volker (1985).

Both approaches to modelling occupational success are used in this study for a number of reasons. First, the model of occupational status attainment determines the general goodness of a job while the probability model of occupational outcomes predicts membership in a particular occupation. Hence the alternative approaches to modelling have the potential to inform on different dimensions of occupational success. Second, comparisons can be made regarding the robustness of the relationships between workers' characteristics and occupational success across model specifications and methods used. Third, a comprehensive representation of the literature is provided. Fourth, as the models of occupational success are used to create measures of job quality for inclusion in the study of the determinants of the duration of jobs, having access to alternative means of constructing the job quality variables permits the robustness of findings to be examined.

## THE OCCUPATIONAL STATUS MODEL

The model of occupational status is given as

$$OC_i = \beta X_i + \varepsilon_i \quad (2)$$

where for individual  $i$ ,  $OC$  is the ANU3 occupational prestige score developed by Jones (1989),  $X$  is a vector of the productivity-related characteristics that affect occupational attainment,  $\beta$  is a set of weights to be estimated that link worker characteristics to occupational attainment, and  $\varepsilon$  is a stochastic disturbance term. The occupational prestige score has been viewed in previous research as a continuous variable, and estimates of  $\beta$  in equation (2) have been obtained using Ordinary Least Squares.

## DETERMINANTS OF OCCUPATIONAL STATUS

A large range of factors may explain variations in the occupational prestige scores. These may be categorised as individual and structural characteristics, and labour market history factors. In terms of individual characteristics, the variables used in the current study are educational attainment, labour market experience, duration of current job, English proficiency, marital status, disability, Indigenous origin, sex, birthplace and duration of residence in Australia for those born in other countries. The structural characteristics include area of residence, the socioeconomic status of the area of residence, employment sector and the size of location (number of employees) of current job. This set of individual and structural characteristics is fairly representative of the literature. The labour market history factors included in the model include a variable for whether the individual had worked prior to obtaining the current job<sup>1</sup> and duration of looking for work since first left full-time education.

These variables are generally included in models of occupational attainment on the basis of arguments grounded in human capital theory, screening explanations of the labour market, and segmented labour market accounts of the job allocation mechanism. A brief explanation follows.

### *Educational attainment*

Previous studies (e.g. Evans 1987; Kidd & Meng 1997) have shown that productivity-related characteristics such as educational attainment and labour market experience have major influences on occupational attainment. Educational attainment can affect occupational status in several ways. First, to the extent that the education process adds value, additional years of education will increase the individual's productivity and hence enable them to be more competitive for the better jobs

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1 This variable can also be used to capture skills and training accumulated in the labour market.

#### *Educational attainment continued*

involving the use of greater levels of skills and being associated with higher pay, prestige and responsibility. Second, education may be used as a sorting device to allocate individuals to jobs. One result may be that educational attainment becomes a filter which precludes the less-well educated from access to good jobs. Hence, education may be used partly as a signal of ability and partly as an additional barrier to entry into occupations. Third, education may reflect different kinds of preparation for different careers (Brown, Moon & Zoloth 1980a), with tertiary education being required for entry into many professional and associate professional positions. Therefore, the relationship between educational attainment and occupational status is expected to be positive.

#### *Labour market experience*

The allocation of individuals across occupations can also be affected by the human capital skills and training acquired in the labour market. For example, labour market experience improves the individual's capacity to learn in a particular job and increases the speed at which an individual can progress between jobs. Previous studies (e.g. Evans 1987) have reported a non-linear relationship between labour market experience and occupational status. That is, occupational status is expected to first increase at a decreasing rate with labour market experience, and then, beyond a certain time in the workforce, occupational status may even fall with additional years of labour market activity. The initial growth in occupational status will reflect the acquisition of job-specific and general labour market skills that are usually associated with the first few years of labour market activity. The reduced rate of growth in later years, and the possible decline in occupational status in the pre-retirement years, reflects the dual effects of decreasing investment in human capital over time and depreciation of the human capital stock.<sup>2</sup> To capture the impact of skills and training accumulated in the labour market, a continuous variable indicating the number of years in paid work since the individual left full-time education and a dichotomous variable indicating if the individual had worked previously, are used. A quadratic functional form is used for the continuous variable to capture the non-linearities reported in previous studies.

#### *Duration of current job*

In addition to general skills acquired on the job, firm-specific skills may also affect occupational attainment. In this instance, the duration of the current job is used to capture firm-specific skills and the individual's desire to work in specific occupations. The individual's desire to remain

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2 The decline in investment in human capital occurs for several reasons. First, the payoff to the investment falls as the individual's working life is shortened over time. Second, the opportunity cost of time increases as the individual ages. Hence, an older person would invest less in human capital compared to a younger person (Mincer 1974).

in a particular job reflects his/her taste for the work involved as well as job stability (Brown, Moon & Zoloth 1980a). Therefore, it is assumed that opportunities for promotion would be enhanced the longer the individual works in a job. As is the case with the general labour market experience variable, a quadratic functional form is used for the duration of the current job variable.

*English proficiency*

English proficiency can influence occupational status through several channels. First, individuals who speak only English may be culturally more similar to the Australian born and so be more acceptable to Australian employers (Evans 1987). Second, those who are proficient in English may be better positioned to take advantage of a wider range of job opportunities. Third, superior language skills may simply be associated with other factors that affect occupational outcomes, such as ability. In all cases, those who are proficient in English are expected to have higher job status compared to those whose command of English is poor.

*Birthplace*

Birthplace variables are included in models of occupational attainment for a variety of reasons. Birthplace will be correlated with English proficiency and the degree of transferability of skills. In this regard, immigrants who were born in a main English-speaking country will have a culture and work practices similar to those of the Australian born, which would make it easier for them to adapt to the Australian labour market. In contrast, immigrants from other than the main English-speaking countries may find that the general knowledge and specific skills accumulated in the labour market of their country of origin are not recognised or are not relevant in the Australian labour market. These factors would affect immigrants' occupational status. In addition, birthplace variables can serve as proxy variables for a range of ethnicity and discrimination factors that influence labour market outcomes such as occupational status.

*Sex*

Sex can influence occupational status in several ways. First, sex can be used as a basis for job discrimination. According to the crowding hypothesis which was developed to explain segregation in the US labour market, discrimination limits women's access to certain occupations (see, for example, Bergmann 1974). Under this hypothesis, employers (and employees) are held to consider some occupations, particularly those involving higher levels of responsibility, to be men's work, and this forces women into other jobs.



#### Sex continued

Hence, women tend to concentrate in low level non-manual jobs such as clerical work. Because the chances of getting promoted are lower in (less skill-intensive) 'female' occupations, women tend to have significantly lower average occupational status than men (see, for example, Greenhalgh & Stewart 1985; Winter-Ebmer & Zweimüller 1992).

However, the extent to which the crowding hypothesis carries across to the Australian labour market is open to debate. It can be seen from table 3.2 that there is a high representation of males in managerial, trades and labourer occupations relative to females. Thus, segregation on the basis of sex in the Australian labour market appears to have the effect of pushing more men, relative to women, into both the more highly skilled (and presumably high paying and high status) and more lowly skilled (and presumably low paying and low status) occupations. Hence, the net impact of sex on the occupational status score cannot be determined *a priori*.

A second way that sex may affect occupational outcomes is through capturing aspects of the person's expected labour market activity that impinge on career choices. Thus, from the human capital approach, an individual's job choice depends on his/her investment in skills. Because women typically have lower expected attachment to the labour force than men, this decreases expected rewards to human-capital investments for women. Therefore, women are less likely to choose highly paid and highly skill-intensive jobs (Polachek 1981; Winter-Ebmer & Zweimüller 1992). In addition, there may be complementarities between market work in some occupations (e.g. nursing, teaching) and some of the activities that women undertake during time out of the labour market (e.g. child care). These complementarities could affect occupational choice.

#### Indigenous origin

Another personal characteristic that may be used as an index in discriminatory labour market practices is indigenous origin. The general arguments that apply here are the same as were noted in the case of discrimination on the basis of sex and birthplace. Thus, a person's indigenous origin may be used as a filter to prevent access to the superior jobs in the workplace characterised by better pay and training, and promotional opportunities.

#### Marital status

Occupational status may also be affected by the individual's family circumstances. In this instance, the link between marital status and occupational status is examined. Married persons are generally presumed to face additional pressure to have a stable career and to succeed because of family responsibilities (Nickell 1982). Therefore, married persons are expected to achieve higher occupational status than those who are not married.

#### *Area of residence*

Regional factors (i.e. geographical location) can also be important in determining occupational status (Leigh 1976). In particular, different geographical locations may represent different local labour markets with respect to earnings and opportunities for advancement. In this regard, it is often assumed that those residing in capital cities will have more opportunities than those residing in small urban or rural areas. Two measures are used to capture the regional effect on occupational status, namely a set of dichotomous variables indicating the area in which the individual resides and a socioeconomic index variable which measures attributes of the residential area (e.g. low income, low educational attainment and high unemployment rate).

#### *Employment sector*

Another structural characteristic which could influence occupational attainment is the sector of employment of the current job. Working conditions and earnings differ between public and private sectors. Compared to the private sector, the public sector offers more secure employment and a large internal labour market (Preston 1997). Hence, it is expected that individuals employed in the public sector will have higher occupational status than those employed in the private sector.

#### *Size of location of employment*

According to the dual labour market hypothesis<sup>3</sup>, the primary (or core) and secondary (or peripheral) sectors of the labour market can be distinguished by the level of wages paid and opportunities for advancement (see, for example, Leigh 1976).<sup>4</sup> The primary sector can be defined by the existence of structured internal labour markets which provide a formal job hierarchy, with employment security, relatively high pay and good advancement opportunities. In contrast, the secondary market is characterised by the absence of internal markets, relatively low pay and limited opportunities for advancement. It is assumed that the larger the size of location of the current job, the larger the internal labour market and hence the greater the opportunities for advancement. Hence a large size of location of employment reflects the existence of a primary sector. On this basis, the size of location of the current job is included in the occupational status model.

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3 The dual labour market hypothesis is one of a number of segmented labour market theories. These theories suggest that the rules that govern access to jobs, and wages and promotion, differ across the labour market in clearly defined ways. Other distinctions sometimes drawn in this literature include 'internal' versus 'external' and 'core' versus 'periphery'. See, for example, Doeringer and Piore (1971).

4 The dichotomy of primary and secondary markets is an analytical simplification to illustrate segmented labour demand.

A final set of factors that are considered in the models of occupational attainment estimated in this study concern the individual's job seeking activities. If an individual spends a long time looking for work after losing his/her job, then this can be associated with losses in human capital as a result of atrophy (see, for example, Polachek 1981). Hence, a negative relationship between absences from the workforce and occupational status is expected. Previous studies (e.g. Nickell 1982) have shown that lengthy absences from the workforce reduce the individual's occupational status. In this study, the duration of looking for work since the individual first left full-time education is used to measure the impact of these types of impediments to the accumulation of general human capital on occupational status.

#### USING THE MODEL TO MEASURE JOB QUALITY

Estimates of the model of occupational status outlined in (2) can be obtained for both Jobseekers (denoted  $\hat{\beta}^J$ ) and the Population Reference group ( $\hat{\beta}^G$ ). These can be compared to provide insights into the job attainment process for each group. The estimates can also be used in various simulation exercises which form the basis of a measure of job quality. Thus, the estimates obtained for the Population Reference group can be combined with the characteristics of the Jobseeker group to generate the occupation status scores that members of the Jobseeker group would have obtained if they were treated in the labour market in exactly the same way as the benchmark group of workers from the Population Reference group. Hence, let

$$\hat{OC}_i^J = \hat{\beta}^G X_i^J \quad (3)$$

be the occupational status score that a Jobseeker would have received if treated the same as a member of the Population Reference group. Let  $OC_i^J$  be the actual occupational status score of a Jobseeker. Then if

$$\hat{OC}_i^J > OC_i^J$$

then the Jobseeker is under-attaining, whereas if

$$\hat{OC}_i^J \leq OC_i^J$$

then the Jobseeker is performing as well or better than what is expected, given his or her productivity-related characteristics. Individuals in the former situation could be categorised as having poor quality jobs while those in the latter situation could be viewed as having a good job.

This mechanism for categorising 'good' and 'poor' jobs can be generalised by incorporating a threshold of assessment into the job categorisation. Under this generalisation, a poor job might be defined as one where

$$\hat{OC}_i^J - OC_i^J > c$$

and a good job where

$$\hat{OC}_i^J - OC_i^J \leq c$$

where  $c$  is a threshold number of points on the ANU3 occupational status scale, for example five or ten.

The estimated models of occupational status for Jobseekers and the Population Reference group can be used in various decomposition exercises (the conventional treatment is based on Blinder 1973 and Oaxaca 1973). In particular, the differential mean occupational status score of 10 points (see table 3.3) between the two groups of workers can be allocated to components that may, on the basis of the characteristics of the groups, and on the way these characteristics translate into occupational achievement, be termed justifiable and unjustifiable. A justifiable component arises where one group (e.g. Jobseekers) possesses fewer of the characteristics known to be associated with higher occupational status. An unjustifiable component arises where the characteristics of one group (e.g. Jobseekers) are found to be associated with lower increments in occupational status than the same characteristics among another group (e.g. the Population Reference group). While such decomposition exercises are not central to the main theme of this study, they have the potential to inform on reasons for the considerable difference in occupational scores revealed in table 3.3. Results will be discussed below.

## ORDINARY LEAST SQUARES RESULTS

Estimates of the model of occupational status for Jobseekers and the Population Reference group are presented in table 4.1.<sup>5</sup> A list of the definitions of variables is contained in Appendix A. This Appendix also contains means and standard deviations of the variables. It is noted that the models presented have been estimated on data pooled across males and females. The validity of this pooling was tested. It was found that gender differences could be represented adequately using only an intercept shift variable in the case of the Jobseeker sample. For the Population Reference group, however, the intercept shift variable does

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5 The samples of the Population Reference and Jobseeker groups used in the estimation is smaller than the samples which the data in table 3.2 are based on due to the exclusion of observations in 'not stated' (still at school) and 'not known' (sector of employment) categories.

not capture fully the differences in the estimations on the basis of sex.<sup>6</sup> However, as the focus of the study is on Jobseekers, where pooling across sex groups is valid, only results obtained for a combined sample of males and females will be discussed in the text. Appendix B contains estimates obtained when the data for males and females are analysed separately.

*Goodness of fit*

The table 4.1 results generally accord with *a priori* expectations and are consistent with previous studies. The F-statistics of 34.76 and 30.36 for the Jobseeker and Population Reference groups, respectively, show that the variables included in the model are jointly significant in explaining variations in occupational status.<sup>7</sup> The  $R^2$  of 0.37 indicates that 37% of the variation in occupational status scores among the Population Reference group is explained by the linear combination of variables listed in the left-hand side column of the table.<sup>8</sup> This level of explanation is generally regarded as quite good in cross-sectional studies of this nature. For the Jobseeker group, the level of explanation of the regression is only 25% of the variation in the occupational status score. This indicates that unobserved factors play a larger role in determining occupational status among the sample of Jobseekers. Included here may be the discrimination and screening influences that subsequent analyses are designed to isolate. The factors that influence the allocation of individuals across occupations are examined below.

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6 The relevant F test statistic of the hypothesis that the model parameters for males and females are the same is 2.67 with 29, 1443 degrees of freedom. This exceeds the critical value of 1.46.

7 The F test is a test of whether all the model terms simultaneously have no impact on occupational status. If the test is significant (i.e. the computed F statistic is greater than the critical value from the F distribution) then it indicates that some, or all, of the variables in the model are significant, in a statistical sense, determinants of occupational status. If the F test is insignificant (i.e. the computed F statistic is less than the critical value from the F distribution) then it means that none of the regressors included in the model contribute, in a statistical sense, to explaining the variation in the occupational status scores of the workers in the sample.

8 The  $R^2$  gives the fraction of the variation in the dependent variable that is explained by the linear combination of explanatory (X) variables.

## 4.1

### ORDINARY LEAST SQUARES ESTIMATES OF MODEL OF OCCUPATIONAL STATUS, POPULATION REFERENCE AND JOBSEEKER GROUPS, 1995

Variable	Population Reference group		Jobseeker group	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	14.803	6.06	12.851	10.21
<i>Educational attainment</i>				
Bachelor degree or higher	30.953	17.67	21.393	15.37
Undergraduate or associate diploma	14.284	8.11	10.181	8.18
Skilled vocational qualification	3.981	3.03	4.740	6.27
Basic vocational qualification	4.643	2.64	4.067	3.88
Attended highest level of secondary school	7.679	5.08	4.025	5.24
Left school aged 16 years and over	2.421	1.66	1.744	2.61
<i>General labour market experience</i>				
Experience (years)	0.508	3.43	0.399	4.69
Experience <sup>2</sup> /100	-1.144	-3.45	-0.945	-4.10
Duration of current job (years)	0.406	2.71	0.481	2.66
Duration of current job <sup>2</sup> /100	-0.497	-0.96	-0.726	-0.83
<i>English proficiency</i>				
Speaks English very well/well	-1.227	-0.70	-0.524	-0.39
Speaks English fairly well/not well/not at all	-3.591	-1.07	-5.225	-2.67
<i>Marital status</i>				
Separated/divorced/widowed	-3.287	-1.95	-0.390	-0.42
Never married	-2.429	-2.16	-1.809	-2.90
Female	1.696	1.91	3.019	5.71
Disability	1.474	1.44	0.146	0.27
<i>Birthplace</i>				
Born in main English-speaking country	1.080	0.44	0.327	0.24
Born in other country	-3.794	-1.39	-0.380	-0.22
Indigenous origin	0.165	0.03	0.825	0.57
Period of residence (years)	0.097	1.17	0.042	0.80
<i>Labour market history</i>				
Never worked	-2.801	-1.14	-1.111	-1.38
Looking for work since first left full-time education (years)	-1.713	-3.81	-0.380	-3.94
<i>Area of residence</i>				
Major urban	1.368	0.92	0.805	0.72
Other urban	-2.112	-1.94	-0.650	-1.11
Rural	-1.206	-0.95	-0.550	-0.75
Socioeconomic index for area of residence	0.140	0.89	0.317	3.37
Public sector	7.431	6.47	6.735	7.12
Size of location 1–10 employees	3.481	3.08	1.512	2.02
Size of location 11–50 employees	-0.272	-0.22	-0.472	-0.58
Size of location 51–100 employees	-1.105	-0.68	-3.189	-3.09
F (30, 1 502)	30.36	..	..	..
F (30, 2 996)	..	..	34.76	..
Adjusted R <sup>2</sup>	0.37	..	0.25	..
Sample size	1 533	..	3 027	..
Weighted estimates ('000)	7 417.5	..	486.0	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980).

### Educational attainment

The results from table 4.1 show that except for one variable, each of the education variables is statistically significant at the 5% level or better.<sup>9</sup> Two statements on these results are possible. First, examination of the coefficients reveals a strong, positive relationship between educational attainment and occupational status. For example, individuals from the Jobseeker and Population Reference groups who possess a bachelor degree or higher, undergraduate or associate diploma, have higher occupational status than individuals who left school at 15 years of age or younger. In other words, the better educated are able to obtain jobs superior to those obtained by the less well educated.

Second, the pattern of effects is not uniform across the two samples. For example, the increases in the status score associated with the two highest educational attainments (i.e. bachelor degree or higher and undergraduate or associate diploma) for the Population Reference group are 31 and 14 points respectively. For the Jobseeker group, the comparable increases in status scores are 21 and 10 points. In other words, the gains in status associated with educational attainment among the most highly educated are inferior for Jobseekers than for the Population Reference group. This differential in impact does not carry over to all levels of educational attainment, however. In particular, Jobseekers with vocational qualifications (either skilled or basic) receive increments in occupational status that are comparable (around 4–5 points) with those obtained by workers with these qualifications in the Population Reference group. Thus, relatively speaking, vocational qualifications offer some advantages to Jobseekers.

### Labour market experience

The results in this study show that skills acquired on-the-job are important to the status of the worker's occupation. Thus, evaluated at ten years, for each extra year of labour market experience, the occupational status of a Jobseeker increases by 0.2 points, at 15 years it increases by 0.1 points and at 22 years occupational status starts to fall by a small amount with experience.<sup>10</sup> For a typical worker, the partial effects of labour market experience on occupational status at 10 and 15 years are 0.3 and 0.2 points, respectively, and beyond 22 years occupational status starts to fall with experience. These partial effects indicate that the skills accumulated on-the-job have a larger impact on

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9 The 't'-ratios reported are statistical tests of the null hypothesis that the true population parameter associated with each of the variables listed in the left-hand column of the table is zero. That is, the 't' ratio provides a test of whether a specific variable affects the occupational outcome. If the 't'-ratio is sufficiently large (greater than 1.96 at the conventional 5% level; 1.64 at the 10% level) then the estimated impact of the variable is said to be significantly different from zero, or the variable or coefficient is 'significant'.

10 The partial effect of occupational status with respect to labour market experience is computed as  $\beta_{\text{exp}} + 2\beta_{\text{exp}^2}(\text{EXP})$ .

the occupational status of workers in the Population Reference group than on the occupational status of Jobseekers. In this respect the results for general labour market experience mirror those for educational qualifications other than vocational qualifications. This suggests that these forms of human capital are associated with the accumulation of similar types of skills.

*Duration of current job*

With regard to firm-specific skills, the impact of duration of current job on occupational status is significant and is dominated by the linear term.<sup>11</sup> In this instance, compared to the general skills accumulated on-the-job, firm-specific skills have a larger impact on occupational status for Jobseekers than for the Population Reference group. These results are consistent with those for vocational qualifications and suggest that for disadvantaged workers, accumulation of specific skills is very important to enhancing their occupational outcome.

*Sex*

Table 4.1 shows that occupational attainment is affected by sex. Thus, compared to male workers, females have higher occupational status. The estimated impact, of two to three points, is, however, much smaller than the partial effects associated with educational attainment and labour market experience. This result is presumably a reflection of the fact that the segregation on the basis of sex that exists in the Australian labour market results in males being over-represented in both relatively high-status and relatively low-status occupations. Moreover, the difference between the estimated impacts for the two samples presented in table 4.1 is minor and statistically insignificant.

*Marital status*

The marital status effects in the model of occupational status are generally significant. Compared to married persons, those who are separated, divorced or widowed, or those who have never married, have lower occupational status. These effects are consistent with the expectations outlined above.

*English proficiency*

While the impacts of the variables discussed above are broadly consistent for the Jobseeker and Population Reference groups, the impacts of the other individual characteristics on occupational status differ between these groups. For example, the relationship between English proficiency and occupational status is significant only for Jobseekers who do speak a language other than English at home and who speak English fairly well, not well, or not at all. Compared to Jobseekers who are monolingual

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11 This model was re-estimated using a linear duration term. Omission of the quadratic duration term does not alter the findings. The quadratic specification is retained for consistency with the functional form used for general experience.



#### English proficiency continued

English speakers, these Jobseekers have lower occupational attainment. This is an interesting result, English proficiency can be viewed as a specific skill that is readily measurable. In this regard it has parallels with the vocational qualifications variables included in the model. Recalling that 80% of Jobseekers were unemployed at the time of recruitment, this suggests that among the more disadvantaged groups in the labour market, it is important to have clearly recognisable skills to gain an advantage.

#### Labour market history

The impacts of labour market history on occupational attainment conform to *a priori* expectations and are consistent for the Jobseeker and Population Reference groups. Thus, individuals who have spent a long period of time looking for work since they first left full-time education have lower occupational status than those who have spent little time looking for work. However, occupational status is not adversely affected in cases where the individual had never worked prior to obtaining their current job. As the regression equation holds constant time spent looking for work and labour market experience, the 'never worked' variable will most likely capture any effects on occupational outcomes associated with labour market entrant status. As such, the finding of a small, negative but insignificant effect is not surprising.

#### Area of residence

The regional effect on occupational status is significant for Jobseekers only. The results in table 4.1 show that the relationship between the socioeconomic status of an area and occupational attainment is positive. Thus, Jobseekers residing in areas with a high value of the socioeconomic index have higher occupational attainment. In a study of unemployment using the same data set it was reported that the socioeconomic status of an area has no significant impact on the unemployment outcome (Le & Miller 1999). That is, residence in a high status neighbourhood does not affect an unemployed person's chances of securing employment. However, the analyses presented in table 4.1 show that if a person living in a high status area obtains a job, it is more likely to be a relatively high status job than would be the case where the person resided in a low status area.

#### Other structural factors

Other structural factors such as sector of employment and the size of location of employment are also important to occupational attainment. Thus, for both Jobseekers and the Population Reference group, compared to those employed in the private sector, those working in the public sector have significantly higher occupational status. As pay and occupational prestige are positively correlated, this is consistent with Preston's (1997) finding that public sector workers have higher rates of pay than private sector workers. With regard to the size of location of employment, compared to the benchmark group of workers employed in

a firm which hires 100 employees or more at a particular location, those working in a firm with fewer than 10 employees at a particular location have higher occupational status, while those employed in a firm that hires 51–100 workers have lower occupational status. These results are not consistent with the expectations outlined previously. They suggest that well defined internal labour markets are not necessary for high levels of occupational attainment. This is suggestive of a labour market where inter-firm mobility among small firms can be used to secure high-status positions just as effectively as promotion within a firm.

*Summary*

Overall, the above results show that individuals with high occupational status are those who are well educated, have general as well as firm-specific skills, are proficient in English, have spent little time looking for work, reside in areas with a high value of the socioeconomic index, are employed in the public sector and either worked in a very small or very large location (Jobseekers only). This information provides us with useful insights into how individuals are allocated across occupations.

#### PREDICTED OCCUPATIONAL STATUS SCORE FOR JOBSEEKERS

Recall that the table 3.3 data show that the mean value of the occupational status score for Jobseekers is 22.4. For the slightly smaller sample used in the estimation reported in table 4.1 the mean value of the occupational status score is 22.3, which is 10 points lower than the mean score for the Population Reference group (32.5 in the sample used in the estimation).<sup>12</sup> Is this below the level that one would reasonably have expected Jobseekers to have achieved? To address this issue the estimated model of occupational attainment for the Population Reference group is used to predict an occupational status score for each Jobseeker on the assumption that Jobseekers were treated the same in the labour market as members of the Population Reference group. Equation (3) is used to generate these values.

*Categorising Jobseekers into good  
and poor jobs*

If Jobseekers were treated in the labour market in the same way as the typical worker, their mean occupational status score would be 23, only one point higher than the score that they actually achieved.<sup>13</sup> It can be seen from table 4.2 that in total 54% of the Jobseekers have a predicted

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<sup>12</sup> See footnote 5, page 36 for an explanation on the different sample sizes.

<sup>13</sup> This measure of the unjustifiable differential in occupational status scores differs from that presented in table 4.3 due to a different assumption on the non-discriminatory occupational structure. See section 4 or Blinder (1973) for a discussion.

occupational status (i.e. the socioeconomic status that is expected, given the Jobseeker's observed productivity-related characteristics) higher than the actual occupational status score.

Furthermore, 39% of the Jobseekers have a predicted occupational status score that is at least five points higher than their actual occupational status score. If a deficiency of five points is considered an appropriate threshold for determining poor jobs, then these Jobseekers are employed in poor jobs. This result can be interpreted in the following manner: a Jobseeker with a predicted occupational status score of say 30 should, on the basis of his or her qualifications, labour market experience and personal attributes, be employed in occupations such as electricians, general fabrication engineering tradespersons or insurance agents. However, where the Jobseeker is actually employed in occupations which have a status score of 25 or below (e.g. intermediate retail and checkout supervisors, greenkeepers or gardeners) then they are employed in poor jobs. In comparison, about 32% of Jobseekers are employed in jobs where the actual occupational status score is at least five points above the predicted score (i.e. they are employed in good jobs).

## 4.2 PREDICTED AND ACTUAL OCCUPATIONAL STATUS SCORES OF JOBSEEKERS

<i>Predicted status compared to actual status</i>	<i>Relative frequency</i>
5 or more points better (%)	39.3
0–5 points better (%)	14.6
0–5 points worse (%)	13.9
5 or more points worse (%)	32.2
Sample size (no.)	3 027
Weighted estimate ('000)	486.0

These results suggest that there is a sizeable segment of the Jobseekers who are under-achieving in terms of occupational status. If this under-achievement translates into job dissatisfaction, then these workers may be more likely to leave their jobs than more satisfied workers. The links between job turnover and the discrepancy between the actual and predicted level of occupational status for Jobseekers are examined in section 6.

### DECOMPOSITION OF THE OCCUPATIONAL STATUS DIFFERENTIAL

As discussed earlier, the occupational status differential between Jobseekers and the Population Reference group can be analysed using a methodology proposed by Blinder (1973). With this approach the results from table 4.1 can be used to decompose the occupational status differential between the two groups into two components. The first component of the occupational status differential arises from differences in the endowments possessed by the Jobseeker and Population Reference groups (termed a justifiable component). It provides an answer to the question: 'If members of the

Jobseeker and the Population Reference groups were treated identically in the labour market, by how much would their mean occupational status scores differ?'. The second component reflects the portion of the occupational status differential between Jobseekers and the Population Reference group arising from different coefficients in the occupational status equations. It provides an answer to the question: 'If Jobseekers and members of the Population Reference group had identical mean levels of characteristics (i.e. the same average educational attainment, the same average levels of labour market experience, etc.), by how much would their mean occupational status scores differ due to the different ways that these characteristics are linked to occupational status for the two groups?'. Such differences are afforded a number of interpretations in the literature, including that they simply reflect the unexplained portion of the occupational status scores of the two groups under review, and that they are a measure of the discrimination (or favourable 'treatment') directed at either the Jobseekers or members of the Population Reference group. In terms of the Blinder (1973) approach, the component due to different coefficients is generally termed the 'unjustifiable' part of the differential in the labour market outcomes under examination. If the 'discrimination' interpretation is followed, then assessment of the first, justifiable, component allows the occupational status of Jobseekers to be compared to that of the Population Reference group in the absence of discrimination.

When undertaking this decomposition, a choice must be made concerning the way the labour market would link personal and other characteristics to occupational status in the absence of discrimination. Among the various alternatives are to assume that the occupational structure depicted in the occupational status equation for the Population Reference group would prevail, the occupational structure depicted in the occupational status equation for Jobseekers would prevail, or some average (simple or weighted by employment shares) of the two would be observed. As the Population Reference group is numerically much greater than the Jobseeker group, and is generally regarded as a benchmark, the analyses presented here assume that, in the absence of any discriminatory factors, all jobs would be distributed according to the occupational structure reflected in the estimates obtained for the Population Reference group. The results of the decomposition are presented in table 4.3.

### 4.3 DECOMPOSITION OF THE OCCUPATIONAL STATUS DIFFERENTIAL BETWEEN THE POPULATION REFERENCE AND JOBSEEKER GROUPS

<i>Components of the decomposition</i>	<i>Values</i>
Differential due to	—
<b>Differences in endowments (justifiable)</b>	<b>8.05</b>
Due to	
Educational attainment	2.35
Experience	0.95
Duration of current job	1.67
English proficiency	0.06
Marital status	0.50
Female	0.02
Disability	-0.06
Birthplace	0.00
Indigenous origin	-0.01
Period of residence	0.08
Never worked	0.14
Looking for work since first left full-time education	1.59
Area of residence	0.13
Socioeconomic index for area of residence	0.20
Public sector	0.61
Size of location	-0.18
<b>Difference in coefficients (unjustifiable)</b>	<b>2.17</b>
<b>Total observed occupational status differential</b>	<b>10.22</b>

The decomposition in table 4.3 provides a much higher level of detail for the component of the occupational status differential between the two groups that is attributed to differences in endowments than it does for the component that is attributed to discrimination. Jones (1983) shows that it is not possible to provide a unique partition of the discriminatory component (into differences in the slope coefficients and differences in the intercepts) when categorical variables have more than two categories. Educational attainment, for example, has seven categories in the current study, while size of location has four categories. In this situation, however, it is still possible to decompose the aggregate justifiable component into sub-components that are linked to each of the sets of explanatory variables (e.g. educational attainment, marital status, etc.).

#### *Decomposition results*

The results from table 4.3 show that the occupational status differential between the Jobseekers and the Population Reference group is 10 points in favour of the Population Reference group. This differential is the net outcome of two forces. First, members of the Population Reference group have superior levels of endowments that are associated with higher occupational status scores. Thus, the table 4.3 results imply that if the two groups' characteristics were rewarded identically in the labour market, then the occupational status of members of the Population Reference group would be eight points higher than that of Jobseekers. A large portion (81%) of the difference in endowments between Jobseekers and the Population Reference group is associated with educational attainment, labour market experience, the duration of current job and the duration of looking for work since first left full-time education. For example, educational attainment and general labour market experience

account for 41% of the differential due to differences in endowments. A further 20% of the endowment component of the differential is associated with time spent looking for work since first left full-time education. Differences in job tenure also contribute 21% to the endowment component of the occupational status disadvantage experienced by Jobseekers. Hence, it is these characteristics that would need to be given most attention if attempts were to be made to reduce the occupational status gap between Jobseekers and the Population Reference group. In comparison, structural (e.g. area of residence, size of location of employment) and other personal (e.g. marital status, English proficiency, birthplace) characteristics play a minor role in explaining the justifiable component of the occupational status differential.

The second factor contributing to the occupational status gap involves differences in coefficients in the occupational status equations of Jobseekers and the Population Reference group. As noted above, this component shows how members of the Jobseeker and Population Reference groups would perform in the labour market if they possessed the same characteristics but the way that these characteristics are linked to occupational status for each group differs as per the estimates listed in table 4.1. The decomposition shows that in this situation, members of the Population Reference group would have a mean occupational status that is slightly higher (by two points) than that of Jobseekers. As noted above, it is not meaningful to further investigate this component of the differential between Jobseekers and the Population Reference group. It is, however, important to note that the unexplained or discriminatory component of the differential is small relative to that part of the differential that can be accounted for by differences in the endowments of the two groups.

*Summary*

Therefore, even in the absence of the unjustifiable factors isolated in this study, Jobseekers perform poorly in the labour market compared to the typical worker because they possess fewer of the skills that are required for entry into more prestigious occupations. As indicated in table 4.3, educational attainment, labour market experience, the duration of current job and duration of looking for work since first left-full time education are the main factors contributing to the Jobseekers' low occupational status. This has a major implication for the main theme of this study, namely that it is poor job quality that is leading to the churning that is a characteristic of the labour market activity of Jobseekers. If this turns out to be the case, then the analyses reported above indicate that this inferior job quality is largely of a type that would be expected, given the skills and other characteristics of Jobseekers. At the aggregate level, remedying the churning phenomenon would not simply be a matter of attempting to obtain better jobs for Jobseekers. Rather, the main issue that would need to be addressed is that the skills of Jobseekers would need to be upgraded so as to enable them to be competitive for the better jobs in the labour market.

## SECTION 5

## ANALYSIS OF A PROBABILITY MODEL OF OCCUPATIONAL OUTCOMES

### AN ORDERED PROBIT MODEL

In probability models of occupational outcomes, the predicted probability that an individual will be in each of a number of occupations is examined. A number of alternative approaches can be considered, including multinomial logit or probit models and ordered probability models (Miller & Volker 1985). In the current study, an attempt is made to predict the probability of membership of each of the occupations listed in table 3.2. An ordered probit specification is used. This model is appropriate where there is an underlying ordering to the occupational categories. As occupation is used as an index of job quality in this study, the index of quality should be integrated into the model specification. The ordered probit approach to the modelling of occupational outcomes can be motivated as follows (see Miller & Volker 1985).

*Structure of the probability model*

Consider the model

$$Y_i = \alpha X_i + \varepsilon_i \quad (4)$$

where  $Y$  is a continuous variable which indexes the perceived 'goodness' of an occupation and  $X$  is a set of characteristics (e.g. educational attainment, labour market experience and job-related factors such as the size of location) that affect this perceived goodness of the work undertaken.<sup>1</sup>  $Y$  is not observed. Instead we observe discrete data on occupation type of the form given in table 3.2. Hence, we may define an occupation variable  $O_i = 1, 2, \dots, K$ , where  $O_i = 1$  if the individual works in the first occupation,  $O_i = 2$  if the individual works in the second occupation and  $O_i = K$  if the individual works in the  $K^{\text{th}}$  occupation.

Membership of one of the  $K$  occupational categories can be determined with reference to the underlying ordering of 'goodness' given by  $Y_i$  by defining a set of threshold levels or separation points,

$$\mu_1 < \mu_2 < \dots < \mu_{K-1}$$

These threshold levels can be used to establish the following well-defined order:

$$\begin{array}{lll} O_i = 1 & \text{if} & Y_i < \mu_1 \\ O_i = 2 & \text{if} & \mu_1 \leq Y_i < \mu_2 \\ O_i = K - 1 & \text{if} & \mu_{K-2} \leq Y_i < \mu_{K-1} \\ O_i = K & \text{if} & \mu_{K-1} \leq Y_i \end{array}$$

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<sup>1</sup> To simplify the exposition the vector  $X$  is defined to contain a constant term.

That is, an individual will be in the lowest ranked occupation (occupation one) where their value of the  $Y$  index falls short of the first threshold level ( $\mu_1$ ). Individuals with a value of the  $Y$  index greater than the first threshold will be in higher-ranked occupations, with the actual occupation being determined by a comparison of their  $Y$  index with the separation points as set out above. Those individuals with the highest values of the 'goodness' index will be in the highest ranked occupation ( $O_i = K$ ). Hence, this model provides a linking between a continuous latent index that reflects general opinion of the relative goodness of the occupations and the ordered occupational categories that are recorded in the data.

Turning to the specifics of the model, given the assumption that the ordering is embedded with a probit model, the conditional probability that individual  $i$  will be located in occupation  $j$  ( $P_{ij}|X_i$ ) is given as

$$P_{ij}|X_i = \Phi(\mu_j - \alpha X_i) - \Phi(\mu_{j-1} - \alpha X_i) \quad j = 1, \dots, K \quad (5)$$

where  $X$  is the vector of characteristics of individual  $i$  described above, the  $\alpha$ s are sets of weights that link the underlying scale of the general goodness of occupations to the individual characteristics contained in  $X$ , the  $\mu$ s are the separation points on the scale which partition membership of the various occupations, and  $\Phi$  is the cumulative density function of the standard normal distribution.

One issue that needs to be accommodated when using the ordered probit model is the choice of criteria to establish rankings. A number of alternatives could be used, including the mean status attainment score of the occupation, the average earnings in the occupation or even the mean educational attainment (as an index of skill). Each of these orderings allows explicit discussion of vertical mobility as distinct from horizontal mobility.<sup>2</sup> However, the different index scales can produce different rankings. Rather than compute estimates on the basis of several alternative underlying rankings (see Miller & Volker 1985), the estimates presented in this paper are based on the ordering of occupations provided by the status attainment scale. This offers a degree of consistency across the various sections of the study. Using the ANU3 scale<sup>3</sup>, workers in managerial and administrative occupations have the highest occupational status scores, workers in professional occupations have the next highest scores, while labourers and related workers have the lowest occupational status scores. The remaining occupations can be

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2 Vertical mobility refers to a situation where a worker moves from one occupation to another occupation that is regarded as superior (e.g. movement from clerical work into administration). Horizontal mobility means that workers move between jobs having similar status (e.g. a move from life scientist to medical scientist).

3 Recall that the ANU3 scale is based on ASCO version two.



ranked uniquely using this scale also. Hence, managerial and administrative occupations are given an ordering value of nine, professionals have an ordering value of eight, labourers and related workers have an ordering value of one, while the other occupations fill out the rankings of between two and seven.

Estimates of this model can be used to simulate occupational distributions. For example, consider a situation where there are two groups of workers, Jobseekers and the Population Reference group. Estimates of the probability model can be obtained for the general population, and these can be denoted by  $\hat{\alpha}_j^G$ . These estimates can be applied to the characteristics of the members of the Jobseeker group, denoted  $X_i^J$ , as follows

$$\hat{P}_{ij}^J = \Phi(\hat{\mu}_j^G - \hat{\alpha}_j^G X_i^J) - \Phi(\hat{\mu}_{j-1}^G - \hat{\alpha}_j^G X_i^J) \quad j=1, \dots, K \quad (6)$$

$\hat{P}_{ij}^J$  as computed from equation (6), is the predicted probability of membership of occupation  $j$  of the  $i^{th}$  member of the Jobseeker group if they were distributed across occupations in the same manner as the Population Reference group.

With this approach, job quality needs to be assessed through comparison of an actual occupation (e.g. work in the professionals occupation) with a predicted probability of working in each of the nine major group occupations. One way to proceed is to classify jobs as good where the actual occupation is the same as, or higher in the occupational hierarchy than, the occupation with the highest probability of membership. In all other cases the jobs would be classified as poor.

There are some difficulties with this method of defining good and poor jobs. As noted by Brown, Moon and Zoloth (1980b), the probability that a particular person is in one occupation need only be slightly higher than one or more of the remaining occupations, or it may clearly be higher than that of all others: in both cases the person is allocated to the occupation with the highest probability of membership. The predictions can also be sensitive to the relative size of the membership of the occupational groups (see Miller & Volker 1985). If, for example, an occupation low in the ranking was dominant in terms of size, then the model will tend to predict relatively high membership of this occupation. The result will be a small fraction of individuals being in jobs that are classified as poor. Conversely, if an occupation high in the ranking was dominant in terms of size, the model will tend to predict a relatively high membership of this occupation. The outcome in this instance would be a relatively large fraction of individuals being in jobs classified as poor. A final shortcoming of the method of classifying jobs as either good or poor is that it does not offer the flexibility of the method used

in the study using the models of occupational status. With that alternative model, a threshold could be incorporated into the job classification algorithm, and this allowed the conditions under which a job will be classified as poor to be tightened where a more stringent view of quality employment is preferred.

A practical job assessment  
algorithm

An alternative job assessment algorithm based on the ordered probit model is to proceed as follows. First, each individual is assigned a value of the general goodness of the occupation using the estimated separation points ( $\hat{\mu}$ ). For example, an individual in occupation  $j$  would be assigned a value  $0.5(\hat{\mu}_j + \hat{\mu}_{j-1})$  (denoted as  $oscale$ ). Then this value for the general goodness of the actual occupation is compared to the individual's predicted position on the underlying scale,  $\hat{\alpha}X_i$ . If  $\hat{\alpha}X$  is greater than the value of the scale assigned to the actual occupation, then the job is categorised as a poor one. In this instance, a threshold ( $c$ ) can be introduced, so that only jobs where  $(oscale + c)$  is less than the value of the scale assigned to the potential occupation are categorised as poor. The value of  $c$  can be chosen to yield a mean level of poor jobs that is the same as that obtained from the study of the ANU3 status attainment score in the previous section.

The simulated occupational distribution can also be used in other exercises that have the potential to inform on the difficulties that Jobseekers experience getting access to good jobs. Hence, differences between the simulated occupational distribution of the Jobseekers obtained from equation (6) and the distribution across occupations of the Population Reference group reveal the impact of the differences in productivity-related characteristics of the two groups on occupational success. In line with the earlier discussion, the difference between the simulated occupational distribution of Jobseekers and the actual occupational distribution for the Population Reference group can be termed a justifiable differential in occupational distributions. Where there are major differences in these occupational distributions, the factors that appear to contribute most to the discrepancy in occupational distributions can be isolated.

Differences between the simulated occupational distribution of the Jobseekers and their actual distribution across occupations reveals the extent to which the different treatments of Jobseekers and members of the Population Reference group in the labour market contribute to the dissimilarity in their occupational distributions. These differences can be termed unjustifiable.

## ORDERED PROBIT RESULTS

The results from the ordered probit models of occupational outcomes<sup>4</sup> for the Jobseekers and Population Reference group are presented in table 5.1. Overall, the results are similar to those from the occupational status model estimated by Ordinary Least Squares.

### *Personal characteristics*

With regard to personal characteristics, educational attainment, general and firm-specific labour market experience, and marital status are significant determinants of occupational outcomes for both Jobseekers and the Population Reference group. The educational attainment variables all have positive coefficients, and all but two are highly significant. The coefficients for the 'bachelor degree or higher' and 'undergraduate or associate diploma' variables are much greater than those for the other education variables. This pattern is similar to that reported for the analysis of the occupational status scores. The impact of labour market experience and duration of current job on occupational outcome is non-linear, while the coefficients on the two marital status variables (for separated/divorced/widowed and never married) are negative.

### *English proficiency*

The impact of English proficiency on occupational attainment differs for Jobseekers and the Population Reference group. The coefficient of the variable for those who only speak English fairly well/not well/not at all is negative and significant for Jobseekers only. In contrast, the coefficient of the variable for speaks English very well or well is negative and significant at the 10% level only for the Population Reference group.

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<sup>4</sup> There are nine occupational categories. To categorise workers into these categories eight thresholds or separation points are needed. The first of these is imposed ( $\mu_1 = 0$ ) and the remaining seven are estimated.

# 5.1

## ORDERED PROBIT ESTIMATES OF MODEL OF OCCUPATIONAL OUTCOMES, POPULATION REFERENCE AND JOBSEEKER GROUPS, 1995

Variable	Population Reference group		Jobseeker group	
	Coefficient	t-ratio	Coefficient	t-ratio
Intercept	0.471	3.38	0.070	0.69
<i>Educational attainment</i>				
Bachelor degree or higher	1.504	16.26	1.281	17.48
Undergraduate or associate diploma	0.898	9.34	0.921	10.96
Skilled vocational qualification	0.374	4.65	0.654	10.37
Basic vocational qualification	0.127	1.14	0.330	4.01
Attended highest level of secondary school	0.383	4.37	0.291	4.85
Left school aged 16 years and over	0.041	0.48	0.146	2.65
<i>General labour market experience</i>				
Experience (years)	0.035	4.15	0.039	6.57
Experience <sup>2</sup> /100	-0.072	-3.81	-0.091	-5.83
Duration of current job (years)	0.020	2.05	0.050	4.35
Duration of current job <sup>2</sup> /100	-0.010	-0.29	-0.100	-2.01
<i>English proficiency</i>				
Speaks English very well/well	-0.140	-1.71	-0.094	-1.12
Speaks English fairly well/not well/not at all	-0.000	0.00	-0.346	-2.80
<i>Marital status</i>				
Separated/divorced/widowed	-0.283	-2.85	-0.085	-1.30
Never married	-0.130	-1.99	-0.085	-1.73
Female	-0.034	-0.63	0.039	0.98
Disability	0.059	0.93	-0.013	-0.30
<i>Birthplace</i>				
Born in main English-speaking country	0.019	0.15	-0.011	-0.12
Born in other country	-0.117	-0.90	-0.022	-0.21
Indigenous origin	-0.250	-0.73	0.064	0.54
Period of residence (years)	0.003	0.69	0.003	0.80
<i>Labour market history</i>				
Never worked	-0.201	-1.05	-0.068	-1.05
Looking for work since first left full-time education (years)	-0.128	-5.19	-0.037	-4.26
<i>Area of residence</i>				
Major urban	-0.015	-0.17	0.072	0.94
Other urban	-0.078	-1.09	-0.139	-3.04
Rural	0.024	0.38	-0.223	-4.13
Socioeconomic index for area of residence	0.018	2.15	0.020	3.03
Public sector	0.265	4.24	0.363	5.95
Size of location 1–10 employees	0.219	3.61	0.161	3.14
Size of location 11–50 employees	0.022	0.33	0.019	0.35
Size of location 51–100 employees	-0.227	-2.77	-0.181	-2.20
$\mu_2(a)$	0.395	13.99	0.458	26.08
$\mu_3$	0.749	21.69	0.818	36.38
$\mu_4$	1.278	31.55	1.339	49.86
$\mu_5$	1.394	33.84	1.395	51.29
$\mu_6$	1.904	41.55	1.936	56.31
$\mu_7$	2.366	46.71	2.332	56.76
$\mu_8$	3.206	58.88	3.305	53.93
$\chi^2(30)$	459.55	..	722.52	..
McFadden R <sup>2</sup> (b)	0.07	..	0.06	..
Sample size	1 533	..	3 027	..
Weighted estimates ('000)	7 417.5	..	486.0	..

(a) The  $\mu$ s are estimates of the separation points that appear in equation (5),

(b) The McFadden R<sup>2</sup> is calculated as  $1 - (I_m / I_o)$ , where  $I_m$  = the maximised log-likelihood value of the model and  $I_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996).

#### *Labour market history*

The results in table 5.1 also show that labour market history is a very important determinant of an individual's occupational outcome. For example, the relationship between time spent looking for work since first left full-time education and occupational outcome is negative and significant. Note, however, that the variables for whether the individual had worked prior to 1995 are insignificant in these analyses. This may mean that recent labour market entrance status does not affect the broad type of occupation that is obtained. These results suggest that different degrees of information are contained in the binary labour market history variable and the 'looking for work since first left full-time education' variable which is measured on a continuous scale.

#### *Area of residence*

Regional effects are also important to the occupational outcomes of Jobseekers and the Population Reference group. In particular, compared to Jobseekers residing in a capital city, Jobseekers living in other urban or rural areas have a lower occupational outcome. Furthermore, the occupational outcomes of both Jobseekers and the typical worker are enhanced by living in an area with a high value of the socioeconomic index.

#### *Other structural factors*

Structural characteristics play a major role in occupational attainment for both Jobseekers and the Population Reference group. For example, the variable for working in the public sector enters the probability model of occupational outcomes with a positive coefficient. With regard to the size of location of employment, compared to those working in a very large location (100 employees or more), individuals working in a small location (1–10 employees) appear to have higher occupational status while those working in a large location (51–100 employees) appear to have lower occupational status. The reason for this pattern of results is not immediately obvious. One possible explanation is that the employment of professional workers in small firms (e.g. medical and dental practices) accounts for the higher occupational status of workers in small enterprises.

### PREDICTED OCCUPATIONAL DISTRIBUTION

The discussion of the estimated coefficients in the ordered probability model above has been couched in terms of general patterns only. This approach was taken because interpretation of the estimated coefficients in an ordered probit model is made difficult by the fact that a particular sign on a coefficient can be associated with an unambiguous change in the predicted probability of membership of only the most prestigious and least prestigious occupations (see, for example, Greene 1991, p. 704). In this situation, an informative way of presenting the information contained in the estimated coefficients is to compute predicted occupational

## PREDICTED OCCUPATIONAL DISTRIBUTION *continued*

distributions for individuals having particular sets of characteristics (e.g. possessing a bachelor degree or higher and left school before their sixteenth birthday). These predicted occupational distributions can be compared to provide information on the impact of the characteristics in question on the occupational distribution (e.g. possessing a bachelor degree or higher rather than having left school before turning 16 years of age).

### *Predicted occupational distribution and educational attainment*

Predicted occupational distributions for different educational attainments (early school leavers and degree holders) and for different numbers of weeks employed in the current job are presented in tables 5.2 and 5.3.

The data in table 5.2 illustrate the relationship between education and the predicted probability of being employed in high prestige occupations with reference to two educational categories, namely left school at 15 years of age or younger and possession of a bachelor degree or higher. A comparison between the two educational categories reveals that individuals who possess a bachelor degree or higher have greater predicted probabilities of being employed in prestigious occupations than individuals who left school before their 16th birthday. For example, the predicted probability of the typical worker who left school at 15 years of age or younger being employed in the professionals occupation is 7%, whereas the comparable probability for a worker with a bachelor or higher degree is 31%. Conversely, the predicted probability of individuals who left school at a young age being employed in low prestige occupations (e.g. labourers and related workers) is higher than that of holders of a bachelor or higher degree. For example, the predicted probabilities of membership in the labourers and related worker occupations in the Population Reference group for the less-well educated and the better educated are 17% and 1%, respectively. A similar difference is also observed for membership in vocational occupations such as tradespersons and related workers.

## 5.2

### PREDICTED OCCUPATIONAL DISTRIBUTION BY EDUCATIONAL ATTAINMENT FOR POPULATION REFERENCE AND JOBSEEKER GROUPS

<i>Occupation</i>	<i>Population Reference group</i>		<i>Jobseeker group</i>	
	<i>Early school leavers(a)</i>	<i>Degree holder(b)</i>	<i>Early school leavers(a)</i>	<i>Degree holder(b)</i>
	%	%	%	%
Managers and administrators	1.3	23.1	0.2	5.0
Professionals	6.8	31.1	2.3	20.0
Associate professionals	9.3	17.3	3.4	14.0
Tradespersons and related workers	16.0	14.5	9.5	21.3
Advanced clerical and service workers	4.3	2.4	1.4	2.1
Intermediate clerical, sales and service workers	20.8	7.4	16.1	17.5
Intermediate production and transport workers	13.0	2.4	13.8	8.6
Elementary clerical, sales and service workers	11.7	1.2	17.9	6.7
Labourers and related workers	16.7	0.7	35.5	4.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

(a) Early school leavers refer to individuals who left school aged 15 years or younger.

(b) Degree holder refers to individuals possessing a bachelor degree or higher.

Source: Authors' calculations based on table 5.1.

There are also considerable differences between the predicted occupational distributions for the Population Reference group and for Jobseekers at each educational attainment displayed in table 5.2. However, given the method of constructing the predicted occupational distributions, these differences will reflect a range of factors. For example, both differences in coefficients on variables other than educational attainment and differences in mean levels of the characteristics will impact on the predicted distributions listed in table 5.2. Accordingly, there is little merit in comparing the table 5.2 results for Jobseekers and the Population Reference group. Appropriate comparisons that hold constant these other factors are presented later.

*Duncan indices based on educational attainment*

A useful summary of these data can be provided by computing the Duncan index of dissimilarity between occupations for early school leavers and degree holders from table 5.2. These indices are 54.0 for the Population Reference group and 46.9 for Jobseekers. Thus, 47% of Jobseekers with a low level of education are in jobs that differ from those held by the well-educated Jobseekers. In contrast, 54% of members of the Population Reference group who left school at 15 years or younger are in jobs that differ from those held by typical workers who possess a bachelor degree or higher. In other words, educational attainment has a greater impact on occupational outcomes among members of the Population Reference group than it does for members of the Jobseeker group. This difference is greater than might have been expected on the basis of a comparison of the coefficients for the two groups in table 5.1, suggesting advantages to the alternative presentation based on comparisons of simulated occupational distributions.

Predicted occupational distributions for two durations of the current job are presented in table 5.3. These data show that membership of the most prestigious occupations is positively related with duration of employment in the current job for both Jobseekers and the Population Reference group. However, it is readily apparent that the difference between the predicted probabilities of membership of the various occupations for the different durations of the current job are reasonably minor.<sup>5</sup>

### 5.3 PREDICTED OCCUPATIONAL DISTRIBUTION BY DURATION OF CURRENT JOB FOR POPULATION REFERENCE AND JOBSEEKER GROUPS

Occupation	Population Reference group		Jobseeker group	
	1 Year	10 Years	1 Year	10 Years
	%	%	%	%
Managers and administrators	4.3	6.1	0.2	0.6
Professionals	14.7	17.9	2.6	5.4
Associate professionals	14.9	16.3	3.7	6.3
Tradespersons and related workers	19.9	20.1	10.0	14.5
Advanced clerical and service workers	4.6	4.4	1.4	1.9
Intermediate clerical, sales and service workers	18.7	17.0	16.7	19.6
Intermediate production and transport workers	9.3	7.9	14.0	14.1
Elementary clerical, sales and service workers	6.9	5.5	17.8	15.7
Labourers and related workers	6.8	4.9	33.6	21.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Authors' calculations based on table 5.1.

The various occupational distributions examined above show that Jobseekers occupy positions that are lower in the occupational hierarchy than the positions held by members of the Population Reference group. To provide a summary of the origins of the Jobseeker disadvantage in this regard, an occupational distribution for Jobseekers was computed using equation (6). This occupational distribution is that which would be expected to be observed where members of the Jobseeker group were distributed across occupations in the same manner as the general population.

Table 5.4 lists relevant results. The first column of this table lists the actual occupational distribution of the Jobseeker group. These data are comparable to the data presented in table 3.2, differing only due to the exclusion of individuals in 'not-stated' and 'not known' categories from

<sup>5</sup> The Duncan indices of dissimilarity were computed to assess the extent of the difference in occupational status between workers who have been employed in the current job for one and ten years. These show that 14% and 7% of Jobseekers and members of the Population Reference group, respectively, who have spent one year in the current job, are in different occupations to those held by individuals who have spent ten years in the current job.



the statistical analysis. The second column in the table lists the simulated occupational distribution for Jobseekers computed using equation (6). This set of data shows how Jobseekers would be distributed across occupations if they were treated in the labour market in the same manner as workers in the Population Reference group. If Jobseekers were treated the same way in the labour market as members of the Population Reference group then they would be more likely to be employed in occupations in the upper and middle of the occupational hierarchy than they are at present. Associated with this shift are smaller predicted representations in the occupations at the bottom of the prestige ranking of occupations.

## 5.4 ACTUAL AND SIMULATED OCCUPATIONAL DISTRIBUTIONS

Occupation	Actual occupational distribution	Simulated occupational distribution	Actual occupational distribution
	Jobseeker group	Jobseeker group	Population Reference group
	%	%	%
Managers and administrators	1.4	2.7	7.4
Professionals	7.3	7.8	16.0
Associate professionals	6.2	8.5	12.1
Tradespersons and related workers	13.2	13.4	16.1
Advanced clerical and service workers	1.7	3.6	3.8
Intermediate clerical, sales and service workers	17.1	17.5	16.6
Intermediate production and transport workers	12.5	11.6	9.3
Elementary clerical, sales and service workers	14.9	11.4	7.9
Labourers and related workers	25.7	23.5	10.7
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Authors' calculations based on table 5.1.

The differences between the first two columns in this table show the impact that different treatments of Jobseekers and of the Population Reference group have on the occupational distribution. The Duncan index of dissimilarity for these two columns is only 6.6. In other words, the different treatments of Jobseekers compared to the Population Reference group results in 7% of Jobseekers being in occupations that are different to those they would be expected to occupy under an 'equal treatment' scenario.

The third column of table 5.4 lists the actual occupational distribution of the Population Reference group. Comparison of these data with the 'equal treatments' occupational distribution of Jobseekers in the second column reveals the impact that the different marketable endowments of Jobseekers and members of the Population Reference group have on the comparison of the occupational distributions of these groups. Thus, it is readily apparent that there is a relatively high representation of members of the Population Reference group in the most prestigious occupations

and a relatively high representation of Jobseekers in the least prestigious occupations. For example, even if Jobseekers were treated in the labour market in exactly the same way as members of the Population Reference group, only 11% would be employed as managers and administrators or professionals compared to the 23% of the Population Reference group employed in these occupations. At the other end of the spectrum of occupations, 35% of Jobseekers are employed as either elementary clerical, sales and service workers or as labourers and related workers. Only 19% of the Population Reference group are employed in these occupations. The Duncan index of dissimilarity for the second and third columns of table 5.4 is 19.5. This suggests that around 20% of Jobseekers are in occupations that differ from those held by members of the Population Reference group because of the differences in the job-related characteristics of the two groups.

*Summary*

Overall, the results indicate that the large differences between Jobseekers and the Population Reference group in occupational distributions are attributable more to the different endowments possessed by Jobseekers than they are attributable to the different ways that Jobseekers and members of the Population Reference group are treated in the labour market. These different endowments result in Jobseekers being over-represented in occupations having low status and under-represented in occupations having medium to high status. These results are consistent with the decomposition exercise in section 4.

*Defining job quality using ordered  
probit results*

The dissimilarity of the actual and simulated occupational distributions for Jobseekers can be used to provide information on the quality of the working episode. It was noted earlier that a poor job can be defined as one where the actual occupation is lower in the occupational hierarchy than the predicted occupation. In the case of the ordered probit model, however, we obtain a predicted occupational distribution. An operational way to proceed is to term 'the' predicted occupation the occupation with the highest predicted probability of membership. Hence, let

$$\hat{O}_j \quad j = 1, 2, \dots, 9$$

be the predicted occupational distribution obtained using equation (6). Then 'the' predicted occupation is defined as

$$\hat{O} = \text{MAX}(\hat{O}_1, \hat{O}_2, \dots, \hat{O}_9) \quad (7)$$

A worker is assessed as having a poor job where  $\hat{O}$  is higher in the occupational hierarchy than the actual occupation.

Using this algorithm, 24% of Jobseekers are suggested to be in poor jobs and 76% are in good jobs. This is considerably lower than the percent of poor jobs (39%) calculated using the models of the ANU3 status attainment score. Furthermore, there is little overlap between the two measures of job quality. In fact only 19% of Jobseekers who were predicted to have poor jobs using the first algorithm based on the ANU3 status attainment score were also predicted to have poor jobs using the second algorithm based on the results of the ordered probit model.<sup>6</sup>

When the alternative algorithm outlined above for classifying jobs based on the ordered probit model was used, a threshold was chosen that would generate the same percentage (39%) of jobs that are poor as was obtained when the model of the ANU3 status attainment score was employed. The overlap between this alternative measure and that obtained from the ordinary least squares estimates is higher than the 19% discussed above, with 27% of Jobseekers who were predicted to have poor jobs using the ANU3 status attainment model being predicted to have poor jobs using the ordered probit model. While this degree of overlap is quite small, this is not unexpected: the occupational status score formed using unit occupational groups provides a more comprehensive measure of general well-being than does the simple ranking based on only nine major occupational groups used in the ordered probit model.

Comparisons between the performance of the job quality variable constructed from the ordinary least squares and ordered probit models should be on the basis of similar mean levels of poor jobs. Accordingly, in the work that follows, only the alternative measure of job quality based on the ordered probit model that incorporates a threshold factor will be used.<sup>7</sup> This approach is also to be favoured given the difficulties with the algorithm based on the predicted probabilities from polychotomous probability models that were outlined earlier.

The links between these discrepancies in the occupational distributions of the two groups and the job churning phenomenon are examined in the next section.

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<sup>6</sup> When these data were examined further, 46% of Jobseekers had an occupational status score which is above the sample mean of 22 points and the remainder have an occupational status score that is equal to or below the sample mean. With respect to the first group of Jobseekers, the extent of the overlap between the two job quality measures is 9%. In comparison, the overlap of the two quality measures (i.e. the measures obtained from the ordered probability model and the study of the ANU3 status attainment score) for the second group of Jobseekers is much greater, at 27%. This indicates that most of the overlap between the two job quality measures appears to occur among Jobseekers with low occupational status.

<sup>7</sup> Estimates of the impact of job quality on job tenure obtained using the measure of poor jobs obtained from the predictions of the ordered probit model in section 6 were significant.

## SECTION 6

### JOB QUALITY AND JOB CHURNING

The study of the determinants of occupational outcomes has shown that there are quite considerable differences between the occupational distributions of Jobseekers and members of the Population Reference group. In general, Jobseekers work in occupations that have lower status than the occupations held by the typical worker. It has been suggested that this differential in labour market outcomes could explain the relatively high rate of job turnover among Jobseekers.

The multivariate examinations of the socioeconomic index of occupational attainment using ordinary least squares and of the occupational outcomes using an ordered probit model revealed, however, that much of the discrepancy between the occupational attainments of Jobseekers and the Population Reference group is largely attributable to the lower levels of qualifications and other productivity-related variables possessed by Jobseekers. Thus, when the actual occupational distribution of members of the Population Reference group and the 'equal treatments' occupational distribution of Jobseekers that was derived from the ordered probit model were compared, it was concluded that different levels of qualifications and other productivity-related variables accounted for the majority of the disparity in the actual occupational distributions of the two groups. In the case of the study of status attainment, about 80% of the differential in the mean status attainment scores of Jobseekers and the Population Reference group could be linked to differences in the mean levels of skills and other characteristics possessed by the two groups. These findings indicate that while locating superior jobs for Jobseekers would be an advantage, by itself it would not overcome the churning phenomenon. If work in low-status occupations is identified with labour market churning, then the major response should be to enhance the skills of Jobseekers rather than to attempt to channel them into an alternative range of superior jobs.

In the short-run, however, it may be more effective to have a focus on the job allocation mechanisms than on the skill acquisition issues that are revealed from the analysis as the main factors contributing to the labour market disadvantage of Jobseekers. This suggestion is based on the presumption that, given the role government already plays in this area, it may be easier to affect the job allocation mechanism than it would be to have a significant impact on mean level of skills among the relatively large pool of Jobseekers.

## MODELS OF JOB DURATION

In order that the information on job quality can be linked to the churning phenomenon, the job turnover of workers assessed as holding poor jobs needs to be compared to the job turnover of workers assessed to be holding good jobs. This comparison needs to be done within a framework where other potential influences on job turnover can be held constant. Job turnover can be assessed in a number of ways. For example, the number of jobs held during a set period (e.g. one year), the fraction of a set period spent working or the duration of a particular working episode could be examined. Each of these measures of the success of the job matching process can be viewed as being linked to the duration of the current working episode. Hence, the analyses that follow will focus on establishing the role that job quality plays in the determination of the duration of the current working episode.

### *Difficulties with modelling job duration*

Modelling job duration is, unfortunately, a difficult task with the data available in the SEUP and most other data sets. Job durations are of two types: jobs that were completed over the time period covered by the data collection and jobs that are on-going at the time of the final interview. These are generally termed completed and interrupted spells respectively. The concept of main economic interest is the underlying distribution of completed jobs. In estimating this, the information contained in both the completed and interrupted spells should be used. Hence, information on labour market patterns beyond the reference period is used in the algorithm for creating job tenure.<sup>1</sup> There are some features of the data that will impact on the ways that the estimates of the influences on job duration are obtained and which may also impact on the estimates themselves. These include:

- Jobseekers with relatively long job tenure are under-represented among the completed job duration data. This appears to be due to two factors: the relatively high rates of job turnover among Jobseekers and the fact that most of the working episodes analysed commenced during the three-year period examined.
- More Jobseekers than members of the Population Reference group have completed spells. In particular, 94% of the working episodes considered for Jobseekers are completed spells while only 44% of the working episodes for the Population Reference group are completed spells. It follows from the first point advanced that these completed spells are disproportionately of short duration. It also follows from this that study of the subset of working episodes that were completed among Jobseekers and the logit analyses outlined below have the potential to provide considerable information on the distribution

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<sup>1</sup> Data from all three waves of the SEUP are used in this section of the study.

of completed working episodes. However, due to the high proportion of interrupted spells among members of the Population Reference group, study of only completed working episodes for this group may provide misleading information.

- A number of the interrupted spells are quite long. For example, among the Population Reference group represented in table 4.1 the mean duration is 10 years and the maximum duration is 46 years. In comparison, among the Jobseekers represented in the same table, the mean interrupted duration is three years and the maximum is 33 years.

#### Job tenure equation

To permit the links between the quality of the job and job duration to be assessed in an appropriate *ceteris paribus* framework, the information on the personal characteristics, type of job and regional factors that has been shown in previous studies to affect relative job tenure must be included in the model. The model to be estimated can be expressed in general form as:

$$TENURE = f(PERSONAL, JOB, REGION, HISTORY, QUALITY) \quad (8)$$

where '*PERSONAL*' is a vector of personal characteristics (educational attainment, general labour market experience, English proficiency, marital status, sex, disability, birthplace, Indigenous origin, period of residence), '*JOB*' comprises variables for the size of location and sector of employment, '*REGION*' includes variables for the area of residence and the socioeconomic index of the area of residence, '*HISTORY*' comprises variables for previous work experience and duration of looking for work since first left full-time education, and '*QUALITY*' is a binary variable for whether the job is a good job constructed from the models of occupational status estimated previously. In some specifications the *QUALITY* variable is replaced by a more general representation of the quality of the job provided by the occupational status score outlined in detail in section 3.<sup>2</sup>

#### Variables included in the job tenure model

The rationale for the inclusion of these variables is straightforward (see, for example, Miller & Volker 1987). Previous research has documented associations between job tenure and a range of personal and job-related characteristics. Miller and Mulvey (1991), for example, found that location, occupation, full-time or part-time employment status,

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<sup>2</sup> Strictly speaking, the model including this more general representation is a simultaneous equations model. A single-equation approach is used here as there are no obvious variables that could be used to identify the models of job tenure and occupational status (i.e. variables that affect tenure but not job status and which affect job status and not job tenure) in the more encompassing simultaneous equations approach.

government employment and educational attainment have important effects on job tenure. Their analyses show that these job tenure effects can be linked to the influence of the variables on both quit and layoff behaviour. For example, full-time employment, government employment, job satisfaction and firm-specific capital are all associated with reductions in the probability of quitting. Similarly, full-time employment and government employment are associated with a decrease in layoffs.

The variables for general labour market experience in the current analysis, will, due to the way they are measured, capture influences that are different from those advanced in previous studies. In Miller and Volker's (1987) study of the youth labour market, the variables for experience were defined with respect to the end-point in the data. They were therefore included in the analysis as scaling factors, providing an adjustment for the fact that individuals who have been in the labour force for only a few years cannot have long job durations. In the current study, however, the variables are measured with reference to the start-point of the data. For the Jobseeker sample, this will be prior to the commencement of the majority of the jobs analysed. Hence, the general labour market experience variables in the equation estimated for Jobseekers will primarily capture life-cycle effects.

Variables for size of location will capture a range of factors. First, the internal labour markets of large firms may provide opportunities for advancement without changing firms. Large firms should therefore be associated with longer durations. Second, survival rates may be higher among large firms than among small firms, with direct consequences for job duration relativities. Similar influences should apply in the case of employment in the public sector compared to the private sector.

A labour market history variable is included in the study. This variable records whether the individual had held a job prior to the current job. As noted earlier, this variable essentially records whether the person could be termed a labour market entrant. Labour market entrants are generally characterised by considerable job shopping, as knowledge of the labour market is often accumulated through a process of sampling or 'experiencing' various employment alternatives. It is therefore expected that individuals who had not worked previously will have lower job durations, *ceteris paribus*.

## ESTIMATION METHODS

### *Probability models*

Several approaches to the estimation of the general expression presented in equation (8) are considered. First, the job durations of the first job that Jobseekers obtain will be categorised either as successful or unsuccessful job matches according to whether the job has lasted for more than a pre-set duration. For example, jobs that last for six months or more could be classified as a successful match. Alternatively, a more stringent criterion, where only those jobs that last for twelve months or more are classified as successful matches, could be used. Under this approach, a binary indicator variable, defined to equal one for successful matches and zero for all other jobs, can be constructed. This variable can then be related to the worker, regional and job characteristics reviewed above and a variable for whether the job is a good job. That is, a probability model may be estimated that aims to predict the chances that a worker will be successfully matched using, among other factors, the index constructed on whether the job is a good one. This probability model can be estimated using logit or probit models. If poor quality jobs, as revealed by either levels of occupational attainment inferior to those that the worker is expected to obtain given their background or by the measure of 'absolute' job quality provided by the ANU3 status attainment score, are a fundamental cause of labour market churning, then we would expect that the job quality variable will enter into the model with a negative sign.

The probability model approach to the study of job durations has the advantage that it can be conducted within a framework that is quite straightforward. Probability models of this type have been used in the Australian labour market literature by Inglis and Stromback (1986) and Ross (1993), among many others. However, a disadvantage of the approach is that it does not make effective use of all the data. By way of illustration, a job that lasts for seven months and one that lasts for 17 months would be treated as being the same under the criterion that sees all jobs that last for six months or more termed successful matches. This aspect of the data could be met by having the dependent variable be a continuous measure of job tenure. In this instance, the fact that the job duration data contain both completed and interrupted working episodes should be recognised. This feature of the data can be accommodated using statistical failure (duration) models. These models may be used to describe the length of the job.

### *Duration models*

In studying failure or duration models, it is useful to define the duration distribution function  $F(t)$  and the corresponding density function  $f(t)$ . The distribution function specifies the probability that a random variable  $T$  (e.g. job tenure) is less than some value  $t$  (e.g. weeks). The distribution function and density function are defined as

$$F(t) = P(T < t)$$



and

$$f(t) = dF(t) / dt.$$

There are a number of concepts that are central to statistical failure models. The first concept is the survival function. This is denoted by  $S(t)$  and gives the probability of a person remaining employed  $t$  weeks after starting a job, namely:

$$S(t) = 1 - F(t) = P(T \geq t).$$

The second concept is the hazard rate. In the context of the job duration model under investigation, the hazard rate  $h(t)$  can be defined as the probability that employment will terminate in the interval  $(t, t + \Delta t)$ . The hazard function is defined as:

$$h(t) = f(t) / S(t).$$

#### Weibull hazard function

The survival and hazard functions can be estimated using either parametric or non-parametric methods.<sup>3</sup> Parametric methods provide for greater precision, but have the disadvantage of being sensitive to the distributional assumptions imposed on the estimation. A wide variety of methods that are relatively easy to compute are available, including the exponential, Weibull and Gamma. The Weibull model is quite flexible, allowing the hazard to be either monotonically increasing, constant or decreasing. That is, the probability that a person will leave employment may either increase as the time actually spent in the job rises, it may decrease with the passage of time in the job, or the probability may not vary with the length of time the person has spent in the particular job. Heterogeneity can be accommodated by incorporating covariates into the estimating equation. It can also be modelled as an unobserved component of the model. It is generally assumed that if the set of explanatory variables is sufficiently large, unobserved variables will have only a minor impact on the hazard rate.

The Weibull probability density function is

$$f(t) = \alpha\beta(\alpha t)^{\beta-1} \exp^{-(\alpha t)^\beta}; \quad \alpha, \beta > 0.$$

The hazard function that corresponds to this is

$$h(t) = \alpha\beta(\alpha t)^{\beta-1} \tag{9}$$

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<sup>3</sup> See Kiefer (1988) for an exposition of parametric and nonparametric estimations.

where  $\beta$  is the Weibull shape parameter. If  $\beta$  is less than one then the Weibull hazard decreases with duration. If  $\beta$  is greater than one the Weibull hazard increases with duration, while if  $\beta$  equals one the Weibull hazard is constant.<sup>4</sup> Cases where  $\beta$  is not equal to one are said to display duration or state dependence. For example, if firm-specific skills are acquired only after some time with the firm, and the acquisition of these skills serves to strengthen the job match, one would expect to observe negative duration dependence.  $\alpha$  is the location parameter in the Weibull model. It is assumed to be affected by the covariates discussed above. The particular linking postulated is

$$\alpha = \exp^{-X\gamma}$$

where  $X$  encompasses all the exogenous variables detailed above. In other words, the location parameter allows the probability that employment will terminate at any given duration to vary across the population depending upon the particular combination of skills and other characteristics that the worker has. An increase in  $X$  (e.g. higher educational attainment) in this specification will be associated with a lower probability of exiting the employment state and hence with longer job tenures. The parameters of the hazard model can be estimated by the method of maximum likelihood. Details can be found in Greene (1997).

## RESULTS FROM LOGIT MODELS OF JOB TENURE

### *Issues relating to modelling job tenure*

In this subsection job duration will be examined using the logit model. Several issues need to be addressed regarding the modelling procedure. As mentioned earlier, two dependent variables for job match are created for consideration in the context of the logit model of job tenure. The first of these is a binary variable indicating if the job has lasted six months or more. The second dependent variable is a binary variable indicating if the job has lasted 12 months or more. Using this algorithm, 55% of Jobseekers had jobs that lasted six months or more and 37% had jobs that lasted at least 12 months. The specification of any particular pre-set duration as the threshold for classifying a job match as successful or otherwise is essentially an arbitrary matter. An examination of alternative thresholds in this regard permits an evaluation of the sensitivity of the findings to the decision made in relation to the threshold duration.

The measure of job quality that is to be incorporated into the estimating equation needs also to be explained. In this study two measures of job quality are used, namely the occupational status score (termed 'ANU3 scale')

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<sup>4</sup> In this case the Weibull density becomes  $f(t) = \alpha \exp(-\alpha t)$ , which is a simple exponential model.

created in section 3 and a binary variable indicating if the job is a poor one (termed 'poor job') based on the measures of job quality created in sections 4 and 5. These variables will, by design, capture quite different influences. The use of the ANU3 scale will provide information on whether poor jobs *per se* are associated with shorter job tenure regardless of the characteristics of the worker employed in those jobs. The use of the measures of job quality created in sections 4 and 5 will provide information on whether job quality needs to be benchmarked against workers' expectations when examining the success of the job match. That is, the implications for worker satisfaction and job tenure of having an unskilled worker with little labour market experience fill a low status job (which would most likely be classified as a good job under the methodology outlined in sections 4 and 5) may be quite different from when the same job is filled by a tertiary educated worker with considerable labour market experience (which would be classified as a poor job using the algorithm developed in sections 4 and 5).

*Logit model of job match*

A final issue that needs to be reviewed is the mechanics of the logit model. The logit model of job match can be expressed as

$$T_i^* = X_i\beta + \varepsilon_i \quad (10)$$

where  $T_i^*$  is a continuous job tenure variable for individual  $i$ ,  $X$  is a vector of observed variables detailed above,  $\beta$  is a vector of coefficients to be estimated and  $\varepsilon$  is a stochastic error term. Two outcomes are derived from  $T_i^*$  with reference to a pre-set threshold (e.g. six months or 12 months). Thus, where the individual is employed in a job that has lasted for more than a pre-set duration,  $T$  is set equal to one. In all other cases it is set equal to zero. The logit model constrains the predicted values from the estimation to be in the unit interval (i.e. 0 to 1).

With the logit model, the natural logarithm of the odds ratio of the probability of having a job that lasted for more than a pre-set duration ( $T$ ) to the probability of having a job that ended before the pre-set duration ( $1-T$ ),  $\log \left[ \frac{T}{1-T} \right]$ , is expressed as a linear combination of the explanatory variables, namely

$$\log \left[ \frac{T}{1-T} \right] = X_i\beta \quad (11)$$

The parameter estimates in the logit model therefore record the impact on the logarithm of the odds ratio of a small change in the explanatory variables. Of greater interest in most cases, however, is the partial effects of explanatory variables on the probability of having a job that lasted for more than a pre-set duration. These can be computed as

$$\frac{\partial T}{\partial X_k} = T(1-T)\hat{\beta}_k \quad (12)$$

where  $X_k$  is the  $k^{th}$  explanatory variable and  $\hat{\beta}_k$  is its associated estimated coefficient. It is conventional to evaluate these partial effects at the sample mean of Jobseekers with jobs that lasted for more than a pre-set duration.

The first part of this subsection will focus on the determinants of jobs that have lasted six months or more. The second part will focus on the determinants of jobs that have lasted at least 12 months.

#### Goodness of fit

The determinants of successful job matches are presented in table 6.1. Overall, the results show that job-related characteristics are very important determinants of successful job matches. The  $\chi^2$  statistic indicates that the variables included in the model are jointly significant in explaining variations in the chances of obtaining successful job matches. The McFadden  $R^2$  of 0.07 is low for this type of estimation.<sup>5</sup> By way of comparison, in models of unemployment outcomes estimated for the Population Reference group in Le and Miller (1999), the values of the McFadden  $R^2$  are as high as 0.49. By analogy with the interpretation of the conventional  $R^2$  in linear regression models, this suggests that factors other than those included in the model are quite important. Related to this is the fact that relatively few of the covariates included in the model are individually statistically significant. Luck, and other attributes associated with the workers but which are unobserved by the researcher clearly play a major role in determining the success of the job match. The findings with respect to the measurable indices of worker quality are discussed below.

#### Educational attainment

The table 6.1 results show that, with the exception of the skilled vocational qualification variable, education variables do not have significant impacts on the probability of the job match being successful.<sup>6</sup>

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<sup>5</sup> The McFadden  $R^2$  for the same type of model estimated using the Population Reference group is 0.20. This also is a relatively low magnitude.

<sup>6</sup> This is similar to the results obtained for the Population Reference group where, for example, labour market experience, English proficiency, birthplace, Indigenous origin, marital status, sex, disability and the area of residence are insignificant determinants of the probability that a job match will be successful. The number of years individuals spent looking for work since they first left full-time education and job quality are significant determinants of job tenure among the Population Reference group.

The positive effect of the skilled vocational qualification variable on successful job matches is consistent with earlier results that skills more closely tailored to actual labour market requirements are more valuable to Jobseekers.<sup>7</sup>

Therefore, the accumulation of specific skills provides advantages to Jobseekers in that it increases the chances that they will be successfully matched with the current job and hence it is associated with a reduction in job churning.

## 6.1 LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS HAVING JOBS THAT LASTED SIX MONTHS OR MORE

Variable	Coefficient	t-ratio	$\partial T / \partial X_k(a)$
Intercept	0.103	0.49	—
<i>Educational attainment</i>			
Bachelor degree or higher	0.208	1.18	5.14
Undergraduate or associate diploma	0.034	0.19	0.84
Skilled vocational qualification	0.379	2.82	9.36
Basic vocational qualification	0.276	1.56	6.82
Attended highest level of secondary school	0.117	0.91	2.89
Left school aged 16 years and over	0.075	0.62	1.85
<i>General labour market experience</i>			
Experience (years)	0.048	3.61	1.19
Experience <sup>2</sup> /100	-0.067	-1.93	-1.66
<i>English proficiency</i>			
Speaks English very well/well	-0.518	-2.77	-12.80
Speaks English fairly well/not well/not at all	-0.217	-0.77	-5.36
<i>Marital status</i>			
Separated/divorced/widowed	-0.118	-0.83	-2.92
Never married	-0.001	-0.01	-0.02
Female	0.142	1.71	3.51
Disability	-0.237	-2.65	-5.86
<i>Birthplace</i>			
Born in main English-speaking country	-0.108	-0.54	-2.67
Born in other country	0.358	1.46	8.85
Indigenous origin	0.237	1.00	5.86
Period of residence (years)	-0.006	-0.82	-0.15
<i>Labour market history</i>			
Never worked	-1.214	-7.73	-30.00
Looking for work since first left full-time education (years)	-0.143	-7.41	-3.53
<i>Area of residence</i>			
Major urban	-0.063	-0.36	-1.56
Other urban	-0.111	-1.14	-2.74
Rural	-0.102	-0.87	-2.52
Socioeconomic index for area of residence	0.007	0.45	0.17
Public sector	-0.009	-0.07	-0.22
Size of location 1–10 employees	-0.081	-0.72	-2.00
Size of location 11–50 employees	-0.130	-1.09	-3.21
Size of location 51–100 employees	-0.151	-0.92	-3.73
<i>Job quality</i>			
ANU3 scale	0.007	2.48	0.17
$\chi^2$ (29)	290.98	..	..
McFadden R <sup>2</sup> (b)	0.07	..	..
Sample size	3 027	..	..
Weighted estimates ('000)	486.0	..	..

(a) This column lists the partial effect of an exogenous variable on the probability of having a job that has lasted for six months or more.

(b) The McFadden R<sup>2</sup> is calculated as  $1 - (l_m / l_o)$ , where  $l_m$  = the maximised log-likelihood value of the model and  $l_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996).

<sup>7</sup> In comparison to the more general skills that are usually associated with secondary school and tertiary education other than the TAFE sector.

#### *Other personal characteristics*

In addition to a skilled vocational qualification, other individual-related characteristics that influence the probability that the job match will be successful include English proficiency, sex and disability. For example, compared to monolingual English speakers, Jobseekers who do not speak English at home but who speak English very well or well are 13 percentage points less likely to have successful job matches.<sup>8</sup> With regard to the effect of sex on the probability of the job match being successful, the results show that female Jobseekers are four percentage points more likely to have successful job matches than male Jobseekers. This may reflect demand-side factors associated with the considerable degree of occupational segregation on the basis of gender in the Australian labour market, or a lack of opportunities available for female Jobseekers that essentially prevents them from changing jobs. Jobseekers who have a disability are six percentage points less likely to have successful job matches. This may reflect the difficulties disabled persons face in the labour market due to their poor health, inadequate working conditions, or discrimination.

#### *Labour market experience*

General labour market experience also affects the probability that a job match will be successful. The table 6.1 results show that the relationship between labour market experience and successful job matches is non-linear. Thus, evaluated at ten years of labour market experience, an extra year of experience increases the probability of a successful job match by about one percentage point, at 15 years an extra year of experience increases the probability of a successful job match by a smaller amount, around two-thirds of one percentage point, and beyond 36 years the probability of a successful job match starts to fall with experience. As mentioned earlier, the non-linear relationship between labour market experience and job tenure is presumed to reflect life-cycle effects.

#### *Labour market history*

The impact of labour market history on successful job matches conforms to expectations. For example, compared to Jobseekers who had worked prior to obtaining the current job, those who had never worked prior to obtaining the current job are 30 percentage points less likely to have a successful job match.<sup>9</sup> This relatively short job duration among labour

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8 The discussion here relates to the partial effects listed in the table. These are not strictly relevant as they apply a concept defined for infinitesimally small changes to a discrete change: the language proficiency variables and most other variables in the table can have values of 0 or 1 only. However, the partial effects will be sufficiently accurate for the general discussion included here. All partial effects have been multiplied by 100 so that they can be interpreted as percentage point impacts.

9 Among the Population Reference group, previous employment is not an important determinant of achieving a successful job match. This suggests that labour market entrants from the Population Reference group are less disadvantaged compared to Jobseekers with similar employment history.

market entrants may, as conjectured earlier, arise from job shopping as a means of accumulating information on the alternatives available in the labour market. Furthermore, Jobseekers who spent considerable time looking for work since they first left full-time education are four percentage points less likely to have a successful job match. This may reflect impediments to the accumulation of general human capital which contribute to job churning. The labour market history variables have the most powerful influence on job tenure, as determined by the size of the  $t$  statistics and the magnitudes of the estimated coefficients.

#### Job quality

The chances that Jobseekers will be successfully matched with their current jobs is significantly influenced by job quality. The result in table 6.1 shows that the relationship between the ANU3 status score and the probability of working in a job for more than six months is positive. This means, *ceteris paribus*, Jobseekers with high occupational status scores (i.e. those who have good jobs) are more likely to have a successful job match. This is consistent with the central theme of this study and suggests that Jobseekers' low occupational prestige contributes to the job churning documented in section 2.<sup>10</sup> It is observed, however, that the impact of the occupational status variable is reasonably modest.<sup>11</sup> For example, a 50 point increase in the occupational status score (which would correspond to a switch from some intermediate clerical and service workers occupation to professionals occupation or from a dental assistant to a life scientist) would give rise to the same impact on the probability of a successful job match as possession of a skilled vocational qualification. This modest *ceteris paribus* partial effect (coefficient of 0.007) can be compared to the more pronounced effect of 0.016 obtained in a simple specification of the estimating equation that contains only a constant term and the ANU3 score. Comparison of these effects obtained from simple and multivariate specifications shows that much of the effect of the quality of the job on job duration is associated with worker characteristics and not with separate, intrinsic dimensions of the jobs.

#### Alternative measures of job quality

Table 6.2 presents the results for alternative measures of job quality. This table includes the job quality variable created from the ordered probit estimates (section 5) and the job quality variable created from the ordinary least squares estimates (section 4). Recall that these measures of job quality define a poor job as one associated with an occupational outcome or status that falls short of that which the worker would be

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10 The results for the job duration model that excludes the job quality variable are presented in Appendix C.

11 The ANU3 scale coefficient for the Population Reference group is 0.037, suggesting that the nature of the job is a more important determinant of job duration among the general population than it is among the particular set of workers in the Jobseeker sample.

expected to achieve given their background. To enhance comparability, 39% of Jobseekers are classed as having a poor job using each of these measures of job quality. Several features of table 6.2 be noted. First, higher levels of education play an important role in determining successful job matches. For example, compared to Jobseekers who left school at 15 years of age or younger, those who possess a bachelor degree or higher are 9 percentage points more likely to have a successful job match. Similarly, Jobseekers who possess skilled or basic vocational qualifications are at least 7 percentage points more likely to have a successful job match than early school leavers. These results attribute a stronger role to educational attainment as a determinant of job tenure than the results presented in table 6.1.

Second, the impacts of other individual characteristics (e.g. labour market experience, English proficiency, sex and disability) and employment history (e.g. previous employment, duration of looking for work since first left full-time education) on successful job matches do not vary greatly across the model specifications considered in tables 6.1 and 6.2.<sup>12</sup>

#### Comparison of job quality measures

Finally, the impact of the relative measures of job quality on the chances of having a successful job match is ambiguous. The coefficient on the poor job variable constructed from the ordered probit estimates of the model of occupational outcomes is negative and significant while the coefficient on the poor job variable constructed from the ordinary least squares estimates of the status attainment model is negative and insignificant. It is therefore unclear from these results whether the relative measure of job quality has an important influence on successful job matches. This is in contrast to the significant relationship between the absolute measure of quality, provided by the ANU3 scale, and successful job matches reported in table 6.1. This difference in findings for the relative and absolute job quality variables can be interpreted in several ways. First, the results may simply mean that it is the absolute dimension of the job, as measured by the ANU3 score, that is the important factor in influencing job turnover. Thus, persons in low status jobs have a higher probability of leaving those jobs than persons in high status jobs, regardless of whether the person's background characteristics would have led one to expect them to be in higher status positions. This finding is consistent with descriptions of labour markets whereby the focal point is the job rather than the individual. That is, there are good

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12 For the Population Reference group, personal and job-related characteristics are generally insignificant determinants of a successful job match. In comparison, the number of years spent looking for work since the person first left full-time education and job quality variables have negative and significant impacts on job tenure. These results do not vary across model specifications.



jobs and poor jobs, and these descriptors apply regardless of who fills the jobs (e.g. regardless of whether a highly educated or a less-well educated person occupies a poor job).

Second, as discussed earlier, the dependent variable used in this model assumes that the probability that a job lasts for six months is influenced by the same factors that influence whether a job lasts for a much longer period of time. If this assumption is not valid then a weak empirical relationship between job tenure and job quality may emerge. The extent to which the difference in findings for the relative and absolute job quality variables has its origin in the way the dependent variable in the analysis has been defined can be examined through the use of the alternative definitions of the dependent variable that were outlined earlier.

#### *Alternative model of job tenure*

A more stringent criterion for a good job match is to model the probability of having a job that lasted at least 12 months. The results for the determinants of job tenure using this definition of a successful job match are presented in table 6.3.<sup>13</sup>

The table 6.3 results do not differ appreciably from those in table 6.1. In other words, the determinants of a successful job match are quite robust across model specifications. For example, job quality has a strong influence on a successful job match. Thus, Jobseekers who are employed in good jobs (i.e. Jobseekers who have a high occupational status score) are more likely to have jobs that lasted 12 months or more. Therefore, irrespective of the measure of a successful job match, the absolute dimension of job quality is very important to reducing job churning. It also appears that the partial effect of the ANU3 score is larger when the threshold job duration for defining a successful job match is set at 12 months than when a six-month cut off is used.

Re-estimation of the model outlined in table 6.3 using the 'poor' job variable based on Jobseekers' underachievement in their current jobs shows (results not reported here) that the discrepancy between the actual and expected job status score (using the ordinary least squares estimates) is not an important determinant of job duration. This mirrors the finding based on the first definition of a successful job match considered in this section.

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<sup>13</sup> The results for the relative job quality variables created from ordered probit and the ordinary least squares estimates are presented in Appendix C. These results are similar to those in table 6.2.

## 6.2

### LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS HAVING JOBS THAT LASTED SIX MONTHS OR MORE, ALTERNATIVE MEASURES OF JOB QUALITY

Variable	(a)			(b)		
	Coeff	t-ratio	$\partial T / \partial X_k(c)$	Coeff	t-ratio	$\partial T / \partial X_k(c)$
Intercept	0.322	1.53	—	0.203	0.97	—
<i>Educational attainment</i>						
Bachelor degree or higher	0.375	2.27	9.26	0.360	2.17	8.89
Undergraduate or associate diploma	0.122	0.68	3.01	0.108	0.60	2.67
Skilled vocational qualification	0.386	2.88	9.54	0.412	3.08	10.18
Basic vocational qualification	0.292	1.65	7.21	0.304	1.72	7.51
Attended highest level of secondary school	0.172	1.34	4.25	0.147	1.14	3.63
Left school aged 16 years and over	0.079	0.66	1.95	0.087	0.72	2.15
<i>General labour market experience</i>						
Experience (years)	0.050	3.80	1.24	0.051	3.86	1.26
Experience <sup>2</sup> /100	-0.071	-2.04	-1.75	-0.074	-2.13	-1.83
<i>English proficiency</i>						
Speaks English very well/well	-0.518	-2.78	-12.80	-0.518	-2.79	-12.80
Speaks English fairly well/not well/not at all	-0.208	-0.74	-5.14	-0.249	-0.89	-6.15
<i>Marital status</i>						
Separated/divorced/widowed	-0.147	-1.04	-3.63	-0.120	-0.85	-2.96
Never married	-0.017	-0.17	-0.42	-0.014	-0.14	-0.35
Female	0.158	1.91	3.90	0.162	1.95	4.00
Disability	-0.228	-2.56	-5.63	-0.235	-2.63	-5.81
<i>Birthplace</i>						
Born in main English-speaking country	-0.108	-0.54	-2.67	-0.104	-0.53	-2.57
Born in other country	0.327	1.33	8.08	0.352	1.44	8.70
Indigenous origins	0.196	0.82	4.84	0.240	1.01	5.93
Period of residence (years)	-0.005	-0.71	-0.12	-0.006	-0.78	0.15
<i>Labour market history</i>						
Never worked	-1.253	-7.96	-30.96	-1.223	-7.80	-30.21
Looking for work since first left full-time education (years)	-0.157	-7.98	-3.88	-0.147	-7.53	-3.63
<i>Area of residence</i>						
Major urban	-0.058	-0.34	-1.43	-0.055	-0.32	-1.36
Other urban	-0.108	-1.10	-2.67	-0.116	-1.18	-2.87
Rural	-0.083	-0.71	-2.05	-0.104	-0.90	-2.57
Socioeconomic index for area of residence	0.008	0.55	0.20	0.009	0.61	0.22
Public sector	0.020	0.15	0.49	0.042	0.33	1.04
Size of location 1–10 employees	-0.058	-0.52	-1.43	-0.070	-0.62	-1.73
Size of location 11–50 employees	-0.135	-1.13	-3.34	-0.135	-1.12	-3.34
Size of location 51–100 employees	-0.187	-1.15	-4.62	-0.172	-1.05	-4.25
<i>Job quality</i>						
Poor job	-0.250	-3.06	-6.18	-0.011	-0.13	-0.27
$\chi^2(29)$	294.15	..	..	284.81	..	..
McFadden $R^2(d)$	0.07	..	..	0.07	..	..
Sample size	3 027	..	..	3 027	..	..
Weighted estimates ('000)	486.0	..	..	486.0	..	..

(a) The job quality variable in these columns of results is obtained from a comparison of the actual occupational outcome with that predicted on the basis of the ordered probit model of occupational outcomes.

(b) The job quality variable in these columns of results is obtained from a comparison of the actual occupational status score with that predicted from the model of occupational status estimated in section 4.

(c) This column lists the partial effect of an exogenous variable on the probability of having a job that has lasted for six months or more.

(d) The McFadden  $R^2$  is calculated as  $1 - (l_m / l_o)$ , where  $l_m$  = the maximised log-likelihood value of the model and  $l_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996).

## 6.3

### LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS HAVING JOBS THAT LASTED 12 MONTHS OR MORE

Variable	Coefficient	t-ratio	$\partial T / \partial X_k(a)$
Intercept	-1.006	-4.56	—
<i>Educational attainment</i>			
Bachelor degree or higher	0.127	0.71	3.14
Undergraduate or associate diploma	-0.015	-0.08	-0.37
Skilled vocational qualification	0.294	2.15	7.26
Basic vocational qualification	0.153	0.83	3.78
Attended highest level of secondary school	0.285	2.08	7.04
Left school aged 16 years and over	0.169	1.30	4.18
<i>General labour market experience</i>			
Experience (years)	0.062	4.60	1.53
Experience <sup>2</sup> /100	-0.065	-1.87	-1.61
<i>English proficiency</i>			
Speaks English very well/well	-0.453	-2.30	-11.19
Speaks English fairly well/not well/not at all	-0.278	-0.97	-6.87
<i>Marital status</i>			
Separated/divorced/widowed	-0.126	-0.88	-3.11
Never married	-0.028	-0.27	-0.69
Female	0.147	1.70	3.63
Disability	-0.035	-0.37	-0.86
<i>Birthplace</i>			
Born in main English-speaking country	-0.233	-1.15	-5.76
Born in other country	0.407	1.61	10.06
Indigenous origin	-0.205	-0.76	-5.07
Period of residence (years)	-0.004	-0.61	-0.10
<i>Labour market history</i>			
Never worked	-1.103	-5.59	-27.25
Looking for work since first left full-time education (years)	-0.163	-7.06	-4.03
<i>Area of residence</i>			
Major urban	-0.107	-0.60	-2.64
Other urban	-0.185	-1.81	-4.57
Rural	-0.130	-1.07	-3.21
Socioeconomic index for area of residence	0.004	0.24	0.10
Public sector	-0.111	-0.84	-2.74
Size of location 1–10 employees	-0.011	-0.10	-0.27
Size of location 11–50 employees	-0.161	-1.30	-3.98
Size of location 51–100 employees	-0.143	-0.84	-3.53
<i>Job quality</i>			
ANU3 scale	0.013	4.37	0.32
$\chi^2$ (29)	334.57	..	..
McFadden R <sup>2</sup> (b)	0.08	..	..
Sample size	3 027	..	..
Weighted estimates ('000)	486.0	..	..

(a) This column lists the partial effect of an exogenous variable on the probability of having a job that has lasted for 12 months or more.

(b) The McFadden R<sup>2</sup> is calculated as  $1 - (l_m / l_o)$ , where  $l_m$  = the maximised log-likelihood value of the model and  $l_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann (1996)).

#### Summary

In summary, the above results indicate that a successful job match is influenced by labour market experience, the employment history of the Jobseeker and by the absolute dimension of job quality reflected in the ANU3 score. At the same time, however, human capital characteristics have only weak influences on the success of the job match. It is unclear at this stage whether the relative dimension of job quality, where jobs are assessed against objective assessments of occupational achievement, has an influence on job tenure.

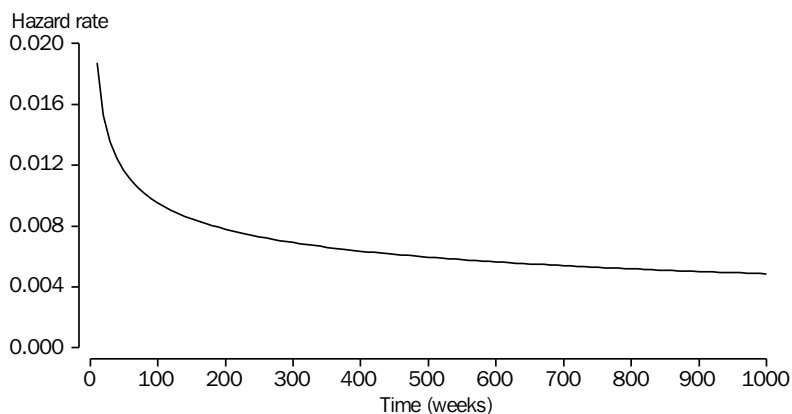
## RESULTS FROM PARAMETRIC DURATION MODELS

In this subsection the results from Weibull parametric duration models will be examined. The dependent variable in this model is the natural logarithm of job tenure. The data are right censored which means that some Jobseekers may have jobs that were still continuing at the time of the final interview. Only 6% of Jobseekers are in this category. The censored variable is a binary indicator that is set equal to one if the Jobseekers have left the current job and zero otherwise.

### *The hazard function*

According to the results in table 6.5<sup>14</sup> the Weibull shape parameter ( $\beta$ ) is less than one, revealing that the duration data are characterised by decreasing duration dependence.<sup>15</sup> That is, the longer the individual has been employed, the less likely it is that they will leave employment in any given time period. The hazard function (equation 9) is plotted in graph 6.4 for an individual with the mean characteristics of the sample. It shows that the probability of exiting the current job decreases over time. The hazard is particularly sharply sloped over the first few years, but tapers off after about five years. For example, the conditional probability that the Jobseeker will leave the current job after ten weeks is 1.9%, after 20 weeks it is 1.5% and after five years the probability of the Jobseeker leaving the current job is about 0.5%. The decline in the hazard rate suggests that the longer the Jobseekers work in the same job, the more they are able to accumulate firm-specific skills that may lead to promotional opportunities and this would reduce job churning.

### 6.4 ESTIMATED HAZARD FUNCTION FOR JOBSEEKERS



<sup>14</sup> The results for the Weibull hazard model that excludes the job quality variable are presented in Appendix C.

<sup>15</sup> In contrast, the Weibull shape parameter for the Population Reference group is greater than one. Hence, the duration data are characterised by increasing duration dependence. That is, the longer the typical worker has been employed, the more likely it is that they will leave employment in any given period. However, the variation in the hazard rate over time for the Population Reference group is relatively small. For example, the probability of exiting the current job after 10 weeks for a worker having the mean characteristics of the sample is 0.09% and after 39 years, the probability that members of the Population Reference group will leave the current job is just 0.13%.

Similar to the results from the logit models of job tenure, the results from table 6.5 show that personal and structural characteristics are generally not important determinants of job tenure. For example, only two out of the six education variables are significant. Thus, compared to Jobseekers who left school at 15 years of age or younger, Jobseekers who possess a skilled vocational qualification and those who have completed the highest level of secondary school have relatively longer job tenures and are less likely to leave their current job.

## 6.5 ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	3.496	23.54
<i>Educational attainment</i>		
Bachelor degree or higher	0.035	0.29
Undergraduate or associate diploma	-0.004	-0.04
Skilled vocational qualification	0.243	2.81
Basic vocational qualification	0.074	0.60
Attended highest level of secondary school	0.213	2.45
Left school aged 16 years and over	0.106	1.30
<i>General labour market experience</i>		
Experience (years)	0.070	8.07
Experience <sup>2</sup> /100	-0.051	-2.37
<i>English proficiency</i>		
Speaks English very well/well	-0.122	-1.01
Speaks English fairly well/not well/not at all	-0.104	-0.54
<i>Marital status</i>		
Separated/divorced/widowed	-0.164	-1.79
Never married	0.047	0.72
Female	0.132	2.28
Disability	-0.110	-1.89
<i>Birthplace</i>		
Born in main English-speaking country	-0.039	-0.26
Born in other country	0.143	0.83
Indigenous origin	-0.147	-0.85
Period of residence (years)	-0.006	-1.10
<i>Labour market history</i>		
Never worked	-0.721	-7.45
Looking for work since first left full-time education (years)	-0.072	-8.35
<i>Area of residence</i>		
Major urban	0.026	0.21
Other urban	-0.087	-1.35
Rural	0.044	0.59
Socioeconomic index for area of residence	0.012	1.31
Public sector	0.065	0.71
Size of location 1–10 employees	-0.175	-2.30
Size of location 11–50 employees	-0.208	-2.55
Size of location 51–100 employees	-0.154	-1.33
<i>Job quality</i>		
ANU3 scale	0.010	4.74
<i>Sample size</i>	3 027	..
<i>Weighted estimates ('000)</i>	486.0	..

#### Personal characteristics continued

Other personal characteristics which are important to job tenure include marital status, sex and disability.<sup>16</sup> For example, compared to male Jobseekers, female Jobseekers have a higher chance of remaining in the current job. As discussed earlier, this may reflect circumstances related to the considerable degree of segregation on the basis of sex that characterises the Australian labour market or a lack of employment opportunities elsewhere for females. The table 6.5 results show that Jobseekers with a disability are more likely to leave their current jobs than Jobseekers who have no disability.

#### Labour market experience

A job-related variable that significantly influences job tenure is general labour market experience. Recall that labour market experience is measured here as the number of years spent working between the time the individual left full-time education and the start of the survey. The relationship between labour market experience and job tenure is non-linear, but tenure increases at a decreasing rate with experience over the range of labour market experience relevant to the sample. As Jobseekers accumulate on-the-job skills and knowledge of the labour market they are less likely to engage in job shopping and are more likely to remain working in the same job for most of their working lives.

#### Labour market history

The table 6.5 results show that labour market history variables are statistically significant and numerically important determinants of job tenure. For example, compared to Jobseekers who had worked prior to obtaining the current job, those who had not worked previously are less likely to continue working in the current job over time. Similarly, the longer the Jobseekers spent looking for work since they first left full-time education, the less chance they have of working in the same job over a period of time.

#### Size of location of employment

The impacts of the variables for size of location on job tenure are significant and conform to *a priori* expectations. Thus, compared to Jobseekers who are working in very large firms (i.e. 100 employees or more) those who are working in small or medium sized firms have shorter job tenures. This finding may reflect lack of opportunities for advancement in small and medium sized firms which forces Jobseekers to change jobs.

#### ANU3 score

The impact of the ANU3 status attainment score on the job tenure of Jobseekers is positive and significant. That is, workers in occupations having a relatively high occupational status score are less likely to leave

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<sup>16</sup> For the Population Reference group, personal characteristics that significantly influence job tenure include marital status, disability, birthplace and English proficiency.

their job at any given point in time and so have longer job tenures, *ceteris paribus*. This result strongly suggests that Jobseekers with high occupational status are less likely to be placed in a position where they will be subject to job churning.

#### Alternative measures of job quality

As discussed earlier, job quality can also be measured in a relative sense using estimates from the ordered probit and ordinary least squares models. Using these approaches, the estimates of the Weibull model of job tenure are presented in table 6.6. The first two columns of data contain estimates for when the relative measure of job quality (poor job) is obtained from the estimates of the ordered probit model. The final two columns of data refer to models based on the measure of relative job quality obtained from the models of the occupational status score analysed using ordinary least squares.

The results in table 6.6 for the variables other than job quality do not vary greatly in terms of magnitude and significance from those in table 6.5. Therefore, the discussion will focus on the impacts of job quality on job tenure. Both of the relative job quality variables are significant, negative and of a reasonably large magnitude.<sup>17</sup> Hence, individuals classified as being in a poor job have relatively short job tenures, that is, they are more likely to leave their job at any given point in time. In short, individuals who occupy poor jobs, whether measured on an absolute or relative scale, are more prone to job churning than other workers.

#### ORDINARY LEAST SQUARES RESULTS FOR JOBSEEKERS WHO HAD LEFT CURRENT JOBS

The discussion thus far has been on data aggregated across all Jobseekers. An alternative approach is to examine job tenure for Jobseekers who had left the current job. Given that the fraction of spells of employment that are completed is quite high for the Jobseeker sample (94%) this alternative investigation should provide reasonably accurate information on the determinants of job tenure and so provide information on the robustness of the findings discussed to date. The dependent variable is the natural logarithm of the number of weeks Jobseekers worked in the current job. The ordinary least squares results are presented in tables 6.7 and 6.8.

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<sup>17</sup> For the Population Reference group, the job quality variable created from the ordered probit estimates is significant and negative while the job quality variable created from the ordinary least squares estimates of the status attainment model is insignificant and negative.

## 6.6

### ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS, ALTERNATIVE MEASURES OF JOB QUALITY

Variable	(a)		(b)	
	Coeff	t-ratio	Coeff	t-ratio
Intercept	3.745	24.99	3.684	24.63
<i>Educational attainment</i>				
Bachelor degree or higher	0.258	2.34	0.279	2.53
Undergraduate or associate diploma	0.112	0.98	0.119	1.03
Skilled vocational qualification	0.256	2.94	0.288	3.33
Basic vocational qualification	0.096	0.77	0.106	0.85
Attended highest level of secondary school	0.278	3.21	0.272	3.12
Left school aged 16 years and over	0.115	1.41	0.123	1.51
<i>General labour market experience</i>				
Experience (years)	0.074	8.55	0.075	8.62
Experience <sup>2</sup> /100	-0.056	-2.63	-0.060	-2.81
<i>English proficiency</i>				
Speaks English very well/well	-0.121	-1.00	-0.124	-1.01
Speaks English fairly well/not well/not at all	-0.102	-0.52	-0.137	-0.70
<i>Marital status</i>				
Separated/divorced/widowed	-0.202	-2.20	-0.186	-2.02
Never married	-0.027	0.41	0.026	0.39
Female	0.166	2.91	0.158	2.73
Disability	-0.103	-1.77	-0.108	-1.87
<i>Birthplace</i>				
Born in main English-speaking country	-0.028	-0.19	-0.019	-0.13
Born in other country	0.109	0.62	0.129	0.74
Indigenous origin	-0.156	-0.95	-0.123	-0.75
Period of residence (years)	-0.005	-1.04	-0.006	-1.12
<i>Labour market history</i>				
Never worked	-0.758	-7.82	-0.739	-7.59
Looking for work since first left full-time education (years)	-0.084	-9.34	-0.080	-8.97
<i>Area of residence</i>				
Major urban	0.020	0.17	0.028	0.23
Other urban	-0.096	-1.48	-0.098	-1.52
Rural	0.057	0.76	0.039	0.53
Socioeconomic index for area of residence	0.012	1.32	0.013	1.40
Public sector	0.111	1.23	0.139	1.55
Size of location 1–10 employees	-0.160	-2.11	-0.163	-2.13
Size of location 11–50 employees	-0.222	-2.73	-0.219	-2.68
Size of location 51–100 employees	-0.200	-1.75	-0.181	-1.57
<i>Job quality</i>				
Poor job	-0.215	-3.78	-0.109	-1.94
Sample size	3 027	..	3 027	..
Weighted estimates ('000)	486.0	..	486.0	..

(a) The job quality variable in these columns of results is obtained from a comparison of the actual occupational outcome with that predicted on the basis of the ordered probit model of occupational outcomes.

(b) The job quality variable in these columns of results is obtained from a comparison of the actual occupational status score with that predicted from the models of occupational status estimated in section 4.

#### Goodness of fit

The estimates from the job tenure model which included the ANU3 scale are presented in table 6.7. The F-statistic of 14.28 shows that the variables included in the model are jointly significant in explaining variations in job tenure across the Jobseeker sample. The adjusted R<sup>2</sup> indicates that 12% of the variation in the duration of current job is explained by the linear combination of variables listed in the left-hand side column of the table. Given that the list of explanatory variables is



quite extensive, this value of the coefficient of determination may be classified as relatively low. This is consistent with the analysis of the logit model above.

*Main influences*

Similar to the results discussed earlier (see table 6.5), the influences of personal characteristics (e.g. educational attainment, English proficiency, marital status) on job tenure are generally weak and will not be discussed further. In comparison, job-related characteristics (e.g. labour market experience) are significant determinants of job tenure.

With regard to employment history, compared to Jobseekers who had worked prior to obtaining their current job, those who did not work spent less time in the current job. As argued previously, this suggests that labour market entrants are disadvantaged in the labour market and they are more likely to experience job churning. While the impact of time spent looking for work since the Jobseeker first left full-time education is significant, the size of the effect is considerably lower than that of previous work experience.

The size of the location of employment has a strong influence on job tenure. For example, compared to Jobseekers working in very large firms, those working in small or medium sized firms have spent less time in the current job.

*Job quality*

Finally, job quality is a significant determinant of job tenure among Jobseekers who had completed working spells. Thus, Jobseekers with high occupational status stayed longer in their job. However, when alternative measures of job quality are used, the relationship between job quality and job tenure among Jobseekers who had left their current jobs is ambiguous. The table 6.8 results show that the coefficient on the poor job variable created from ordered probit estimates is significant and negative. In contrast, the coefficient on the poor job variable created from ordinary least squares estimates is insignificant. This pattern of effects is the same as reported for the logit models of job duration.

## 6.7

### ORDINARY LEAST SQUARES RESULTS OF JOB TENURE FOR JOBSEEKERS WHO HAD LEFT JOB

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	3.190	19.90
<i>Educational attainment</i>		
Bachelor degree or higher	-0.102	-0.75
Undergraduate or associate diploma	-0.192	-1.30
Skilled vocational qualification	0.129	1.18
Basic vocational qualification	0.009	0.07
Attended highest level of secondary school	0.010	0.11
Left school aged 16 years and over	-0.002	-0.02
<i>General labour market experience</i>		
Experience (years)	0.046	4.21
Experience <sup>2</sup> /100	-0.045	-1.42
<i>English proficiency</i>		
Speaks English very well/well	-0.187	-1.29
Speaks English fairly well/not well/not at all	-0.020	-0.10
<i>Marital status</i>		
Separated/divorced/widowed	-0.009	-0.08
Never married	0.066	0.84
Female	0.048	0.75
Disability	-0.126	-1.77
<i>Birthplace</i>		
Born in main English-speaking country	0.010	0.06
Born in other country	0.257	1.36
Indigenous origin	0.014	0.08
Period of residence (years)	-0.009	-1.36
<i>Labour market history</i>		
Never worked	-0.914	-9.04
Looking for work since first left full-time education (years)	-0.125	-8.18
<i>Area of residence</i>		
Major urban	0.068	0.54
Other urban	-0.086	-1.27
Rural	0.015	0.17
Socioeconomic index for area of residence	0.011	0.99
Public sector	0.112	1.06
Size of location 1-10 employees	-0.285	-3.39
Size of location 11-50 employees	-0.359	-3.89
Size of location 51-100 employees	-0.176	-1.43
<i>Job quality</i>		
ANU3 scale	0.008	3.43
<i>F (29, 2 804)</i>	14.28	..
<i>Adjusted R<sup>2</sup></i>	0.12	..
<i>Sample size</i>	2 834	..
<i>Weighted estimates ('000)</i>	456.5	..

## 6.8

ORDINARY LEAST SQUARES RESULTS OF JOB TENURE FOR JOBSEEKERS WHO HAD LEFT JOB,  
ALTERNATIVE MEASURES OF JOB QUALITY

Variable	(a)		(b)	
	Coeff	t-ratio	Coeff	t-ratio
Intercept	3.414	21.33	3.31	20.60
<i>Educational attainment</i>				
Bachelor degree or higher	0.081	0.62	0.074	0.56
Undergraduate or associate diploma	-0.097	-0.66	-0.105	-0.72
Skilled vocational qualification	0.140	1.29	0.166	1.53
Basic vocational qualification	0.032	0.26	0.044	0.35
Attended highest level of secondary school	0.069	0.69	0.050	0.50
Left school aged 16 years and over	0.004	0.05	0.014	0.15
<i>General labour market experience</i>				
Experience (years)	0.048	4.40	0.050	4.49
Experience <sup>2</sup> /100	-0.048	-1.51	-0.052	-1.63
<i>English proficiency</i>				
Speaks English very well/well	-0.184	-1.26	-0.189	-1.30
Speaks English fairly well/not well/not at all	-0.020	-0.09	-0.059	-0.28
<i>Marital status</i>				
Separated/divorced/widowed	-0.036	-0.32	-0.015	-0.13
Never married	0.048	0.62	0.050	0.64
Female	0.063	0.99	0.064	1.00
Disability	-0.117	-1.62	-0.123	-1.70
<i>Birthplace</i>				
Born in main English-speaking country	0.014	0.09	0.020	0.12
Born in other country	0.228	1.21	0.250	1.33
Indigenous origin	-0.021	-0.12	0.019	0.11
Period of residence (years)	-0.008	-1.25	-0.008	-1.32
<i>Labour market history</i>				
Never worked	-0.950	-9.41	-0.927	-9.18
Looking for work since first left full-time education (years)	-0.138	-8.89	-0.131	-8.47
<i>Area of residence</i>				
Major urban	0.072	0.59	0.077	0.63
Other urban	-0.082	-1.07	-0.094	-1.23
Rural	0.032	0.36	0.009	0.10
Socioeconomic index for area of residence	0.013	1.14	0.014	1.20
Public sector	0.144	1.37	0.166	1.58
Size of location 1–10 employees	-0.264	-3.15	-0.275	-3.28
Size of location 11–50 employees	-0.366	-3.96	-0.364	-3.93
Size of location 51–100 employees	-0.220	-1.80	-0.200	-1.64
<i>Job quality</i>				
Poor job	-0.251	-3.93	-0.049	-0.76
<i>F</i> (29, 2 804)	14.53	..	13.94	..
<i>Adjusted R</i> <sup>2</sup>	0.12	..	0.12	..
<i>Sample size</i>	2 834	..	2 834	..
<i>Weighted estimates</i> ('000)	456.5	..	456.5	..

(a) The job quality variable in these columns of results is obtained from a comparison of the actual occupational outcome with that predicted on the basis of the ordered probit model of occupational outcomes.

(b) The job quality variable in these columns of results is obtained from a comparison of the actual occupational status score with that predicted from the model of occupational status estimated in section 4.

## COMPARISON OF RESULTS ACROSS MODELS

In summary, the results are quite robust across model specifications. Personal characteristics in general have quite minor influences on job tenure. The influence of labour market history variables on job tenure has been shown to be quite important.

One of the important findings is that there is a strong positive relationship between the absolute measure of job quality and job tenure. In this instance, Jobseekers in poor quality jobs are more likely to leave these jobs regardless of the specific characteristics of the workers. That is, if we place a highly skilled worker in a poor job that worker is just as likely to leave that job as is a less skilled worker in the same job. The hypothesis that the crucial factor in determining worker turnover is the relativity between the actual occupational outcome and that the worker would be expected to obtain given their characteristics was examined. The evidence reported from the parametric duration models favours this proposition while the findings from the logit and ordinary least squares models of job tenure are inconclusive. As discussed in section 2, Jobseekers experienced, on average, a higher number of episodes of work than members of the Population Reference group and this is caused by both poor quality jobs, and poor jobs relative to the job types that the workers could reasonably expect to obtain. At this stage the relative merits of those contributions to shorter job tenures cannot be evaluated.<sup>18</sup>

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18 One way of examining the merits of the absolute and relative measures of job quality is to estimate a model that includes both variables. As the relative measure based on the ANU3 scale is constructed using the ANU3 score for the worker's actual occupation, this encompassing model can only be considered in the context of the relative quality variable considered from the ordered probit results. The main finding from this approach is that only the absolute dimension of job quality is a significant determinant of the job tenure.

## SECTION 7

### EARNINGS AND JOB TENURE

As previously discussed, job quality can be measured in a number of ways. One approach, used in sections 4 and 5, involves evaluating job quality on the basis of a worker's occupational status. Both an absolute scale given by the status attainment score of the worker's occupation, and a relative scale computed as the difference between a worker's expected and actual occupational status, were considered in models of job tenure in section 6. The occupational status score has the potential to capture the general goodness of the job, which includes both pecuniary and non-pecuniary compensations. In this section, an alternative measure of job quality that focuses only on the pecuniary compensation of the job is examined. Again, both an absolute scale provided by a worker's wage, and a relative scale given by the difference between the expected and actual earnings of the job, are considered. Comparison of the findings from the current set of analyses with those reported in earlier sections will allow an assessment of the relative importance of pecuniary and non-pecuniary compensations, as measures of job quality, in models of job tenure.

This section will be organised into three subsections. The first subsection focuses on the wage model and the determinants of earnings. In the second subsection, estimates from the earnings models are used to generate measures of job quality. The third subsection links the earnings-based job quality variables to job tenure.

#### THE WAGE MODEL

The first part of this section involves estimating an earnings function. The wage model used here is based on the theory of earnings developed by Mincer (1974), where an individual was described as receiving earnings as a return to education and work experience. An expansion of this model to take account of other personal and job-related characteristics is adopted. The earnings function is expressed as

$$W_i = \delta Z_i + \varepsilon_i \quad (13)$$

where for individual  $i$ ,  $W$  is the natural logarithm of the hourly wage,  $Z$  is a vector containing the personal and job-related characteristics described previously (see the model of occupational status in section 4),  $\delta$  is a set of weights to be estimated that link these characteristics to earnings and  $\varepsilon$  is a stochastic disturbance term that captures the influences on earnings of variables that are unmeasured (e.g. motivation, luck). Estimates of  $\delta$  will be obtained using Ordinary Least Squares.

The rationales for the inclusion of the various variables in the model of wage determination are similar to those discussed in relation to the model of occupational status. Only brief comments will therefore be provided. These comments are structured as follows. First, the personal characteristics of the workers that are typically considered for inclusion in the model are reviewed. Second, characteristics of the area of residence of workers are considered. Third, labour market history variables are discussed.

*Educational attainment*

A central focus of most studies of wage determination is the role of educational attainment. The dominant paradigms to account for the relationship between wages and educational attainment are human capital theory and the screening model. Both predict a positive relationship between the level of education and earnings. Previous Australian studies confirm the importance of educational attainment in studies of wage determination: Kidd and Viney (1991), Miller and Mulvey (1996) and Preston (1997), among others, have shown that educational attainment is a highly significant determinant of wages, with the income returns being quite considerable among the tertiary educated.

*Labour market experience*

Experience accumulated in the labour market is the second major medium through which an individual may enhance his/her productivity and hence receive higher earnings. It is generally argued that labour market experience captures an individual's post-school investment in furthering his/her job skills and acquiring job-related information. Previous studies of the Australian labour market by Kidd and Viney (1991), Rummery (1992) and Preston (1997) have reported that the relationship between earnings and labour market experience is non-linear: during the first few years of labour market activity earnings increase quite sharply with additional years in the labour market, though these increases become progressively smaller among more experienced workers. And, after about 30 to 35 years of labour market activity, earnings are shown to decline with additional years of labour market activity. Evaluated at ten years of labour market experience, an additional year of experience increases the earnings of males between 1.5% and 2.7%, which is around one-quarter of the impact that a year of education has on earnings.

*Duration of current job*

The duration of the current job is typically included in the models of earnings determination to capture the impact of firm-specific skills on wage outcomes. A second reason for considering job tenure as a determinant of wages is that the longer a worker remains in his/her job the greater are his/her promotion opportunities. Previous Australian studies by Chapman and Mulvey (1986), Miller and Rummery (1989) and Miller and Mulvey (1996) have shown that the relationship between job

*Duration of current job continued*

tenure and earnings is non-linear, with the greatest increases in earnings with additional years of job tenure coming in the first few years in the job. However, the change in earnings associated with job tenure is much smaller than that associated with labour market experience. For example, evaluated at 10 years in the current job, an extra year spent in the current job will increase earnings by between 0.5% and 1%. The difference in the returns between job tenure and general labour market experience may reflect the large wage effect of ageing associated with labour market experience in the Australian labour market.

*English proficiency*

English proficiency variables are also entered into the earnings equation in a number of studies (e.g. Stromback 1984; Chiswick & Miller 1985; Miller & Mulvey 1996), as language skills are another form of human capital. Individuals who self-report their English skills as very well/well are expected to have access to a wider range of job opportunities than those who lack this skill. Accordingly, individuals who are proficient in English are expected to earn higher income than individuals who speak English fairly well, not well or not at all.

*Birthplace, Indigenous origin*

Birthplace variables are entered into the earnings function to control for the degree of transferability of skills across countries, potential productivity differentials between workers from the various countries of origin that are associated with differences in the labour markets in the origin countries, and employers' discrimination on the basis of birthplace. Previous studies (e.g. Miller 1994; Langford 1995) have shown that individuals who were born overseas in main English-speaking countries experienced wage structures similar to those born in Australia. In comparison, individuals who were born in other than main English-speaking countries earn significantly less than both the Australian born and those born overseas in the main English-speaking countries. Accordingly, the empirical analyses presented below distinguish the foreign born according to whether they were born in the main English-speaking countries. The variable for Indigenous origin is entered into the earnings function to capture the earnings differential associated with different skills of Indigenous workers and non-Indigenous workers as well as any discriminatory factors.

*Period of residence, sex, disability,  
marital status*

Additional variables in many empirical studies of wage determination include controls for period of residence, sex, disability and marital status (see, for example, Chiswick & Miller 1985; Rummery 1992; Miller 1994; Miller, Mulvey & Martin 1995; Miller & Mulvey 1996; Preston 1997). The extent to which the labour market performance of individuals who were born overseas differs from that of those who were born in Australia

depends on their transition into, and knowledge of, the local labour market. This may be influenced by the length of time they have spent in Australia. In this regard, period of residence could increase earnings in a number of ways. First, this effect may be associated with knowledge of the Australian labour market and customs. Second, accumulation of country-specific skills would enhance the employability and promotion opportunities for individuals who were born overseas. Period of residence is entered into the wage determination model in linear form.<sup>1</sup>

Sex is generally entered into the earnings function for a number of reasons. One of these is to control for differences in any unobserved human capital characteristics of men and women (e.g. subject choice at school, type of degrees). The sex variable will also capture aspects of the wage structure that are attributed to discrimination. These have been the subject of a number of studies in the Australian labour market (the studies by Rummery 1992 and Langford 1995 are of special note), and there is agreement that, despite the various Equal Pay and Sex Discrimination initiatives, there remains considerable inequality in the wage outcomes of men and women in the Australian labour market.

The inclusion of the disability variable in the earnings function controls for particular characteristics (e.g. ill health) that would limit the individual's earnings capacity or invoke employers' discrimination. There have been few studies that consider the wage effects of disabilities in the Australian labour market. One study of young males by Vella and Gregory (1992) included information on whether a worker's health is impaired. They find that workers with impaired health have lower wages (by around 4%) and experience slower growth in wages over time.

The expected impact of marital status on earnings differs between males and females. For males, marriage is expected to be positively associated with earnings for several reasons. First, marital status captures the greater employment stability and commitment of the married compared to unmarried males. Hence, it is assumed that married men may be more productive than unmarried men (Becker 1981, 1985; Kenny 1983). Second, some employers may favour married males (Hill 1979; Bartlett & Callahan 1984). Finally, men may be selected into marriage on the basis of personal characteristics that are valued in the labour market (Becker 1981) but which are otherwise not included in the estimating equation. For females, marriage is expected to be negatively associated with earnings to the extent that marriage encourages women to acquire less job training than married men during their pre-maternal employment (Mincer & Polachek 1974). Alternatively, due to domestic arrangements, married women may seek more convenient or less demanding jobs (Becker 1985).

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<sup>1</sup> Chiswick and Miller (1985) found that the overall explanatory power of the wage equation remains relatively the same whether duration of residence or its square is included in the wage equation.



The empirical evidence on the impact of marital status on earnings of males is consistent with the above hypotheses (see, for example, Chiswick & Miller 1985; Tran-Nam & Nevile 1988; Kidd 1993). For females, Rummery (1992) and Miller (1994) found that the earnings of married women used to be lower than those of their single counterparts. However, the earnings differential has been eliminated over time.

Almost all studies include variables for the worker's characteristics reviewed above. The estimated effects are generally quite strong, and a reasonable degree of agreement has emerged in the literature (see, for example, Preston 1997). In contrast, a variety of approaches have been taken in relation to the location variables covering area of residence and the socioeconomic characteristics of the area of residence. In addition, there are considerable differences across studies with respect to the treatment of structural characteristics (e.g. sector of employment, size of sector of employment) and the individual's labour market history in the wage determination model. These issues will be discussed below.

#### *Area of residence*

In addition to personal-related characteristics, many of the studies of wage determination in the Australian labour market, for example, Mulvey (1986), Miller and Rummery (1989), Rummery (1992), Miller and Mulvey (1996) and Preston (1997), have included variables for geographical location in the earnings function. Wages may vary with location if location captures variations in the employment opportunities available or labour market supply differences across regions. Another reason for including area of residence in the earnings function is that in Australia there exist both Federal and State systems of wage determination. However, previous studies have used a wide variety of specifications for the location variables (for example, State, section of State, a rural/urban dichotomy), and this precludes drawing strong conclusions. However, on the basis of the work of Rummery (1992) and Preston (1997), it appears that workers living in major cities earn more than those residing in non-metropolitan or rural areas.

#### *Employment sector*

Sector of employment is entered into the earnings function to capture different working conditions and methods of wage determination in the public and private sectors. Miller and Mulvey (1996) and Preston (1997) found that individuals working in the public sector receive significantly higher earnings than those working in the private sector.<sup>2</sup>

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<sup>2</sup> A number of studies have included information on the industry and occupation of a worker's employment. Preston (1997) summarises the findings.

A number of hypotheses have been advanced in previous studies to account for the relationship between firm size and wages. For example, the size of location of employment is used to capture differences in wage determination between the primary and secondary sectors of the labour market. It is assumed that individuals working in a very large location earn more than those working in smaller locations. Second, due to unpleasant working conditions in large firms (e.g. greater reliance on rules and less freedom of action, and more impersonal work atmosphere), high wages are offered to entice workers to remain. Third, large firms employ higher-quality workers because of greater capital intensity. Fourth, large firms hire higher-quality workers to reduce the costs of monitoring. A related argument is that large firms are less able to monitor their workers and they are willing to pay more for workers of given quality. A fifth reason why large firms pay higher wages than smaller firms is that large firms want to avoid unionisation. Other explanations for the positive relationship between earnings and firm size are that large firms have a greater ability to pay high wages and they face a smaller pool of labour supply relative to labour demand. Hence, large firms are forced to pay higher wages to satisfy greater labour input demand (Brown & Medoff 1989). However, while the previous studies of Miller (1994) and Miller and Mulvey (1996) have reported a positive and significant relationship between firm size and wages, "The nature of the relationship between firm size and wages continues to be regarded as something of a mystery." (Miller & Mulvey 1996, pp. 139–140).

The earnings of individuals are also assumed to vary with previous labour market performance. There are a number of reasons for this. At the most fundamental level, previous employment experience would enable workers to accumulate relevant job-related knowledge and skills which would enhance their earnings. Therefore, compared to those who had not worked prior to obtaining the current job, those who had worked would be expected to earn more. Similarly, time spent looking for work can affect the individual's earnings. As discussed previously, time spent away from work can be associated with loss of human capital and hence lower earnings.

A second reason for including a labour market history variable in a wage equation is that there may be a stigma associated with periods of joblessness. Individuals with a scar of unemployment will therefore be disadvantaged in the labour market. A third reason for including information on labour market history in the wage equation is that it provides an important control for the range of unobservable factors that affect both wages and labour market attachment. While the variables (e.g. motivation) are unobserved, they will be embedded in the lagged labour market history variable. This is discussed further in Le and Miller (1999). Therefore, a negative relationship between the duration of looking for work and earnings is expected.

One study which examined the impact of previous unemployment duration on earnings in the Australian labour market is Miller and Volker (1987). They found that a recent prolonged period of unemployment reduces the earnings of males by 5%, although this is significant only at the 10% level. The minor statistical and economic impact of previous unemployment experience on earnings (Miller & Volker 1987) and the strong statistical and economic impact of a history of joblessness on unemployment probabilities (Miller & Volker 1987; Le & Miller 1999) suggest that previous unemployment experience may be used as a screening device in determining who gains a job and who remains unemployed but it has only a minor influence on wage determination. The Miller and Volker (1987) result contrasts with the study by Blandy and Richardson (1982) of the Australian labour market and Freeman and Wise's (1982) conclusion concerning the U.S. youth labour market, that "there is little evidence that time spent out of work early in a youngster's career leads to recurring unemployment. Rather, the cost of not working is the reduction in wages persons suffer later because they failed to accumulate work experience" (quoted in Miller & Volker 1987 p. 113).

Earnings functions that contain the variables outlined above will be estimated separately for members of the Population Reference group and Jobseekers.<sup>3</sup> The average hourly wage for workers from the Population group (\$15.67) is much higher than that for Jobseekers (\$11.41). Below is a discussion of the determinants of earnings for both groups that may account for this differential in mean earnings.

## EMPIRICAL RESULTS OF THE DETERMINANTS OF EARNINGS

### *Goodness of fit*

The results of the estimation of the earnings functions are presented in table 7.1 for the Population Reference and Jobseeker groups.<sup>4</sup> Overall, the results are similar to those reported in previous Australian studies. The F statistics of 13.09 for the Population Reference group and 19.40 for the Jobseeker group indicate that the variables in the left-hand column are jointly statistically significant determinants of earnings. The

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<sup>3</sup> The samples of the Population Reference and Jobseeker groups used in this section are, in principle, the same as those used in previous sections. For the Population Reference group, jobs that started on or before 1 June 1995 are selected and for Jobseekers jobs that started on or before 5 September 1995 are selected. This means that jobs are chosen over a similar time period for the Population Reference and Jobseeker groups and enable comparative analysis of earnings to be undertaken between these two groups. In addition, by focusing on the wave one data we can avoid the problem of sample loss due to attrition associated with waves two and three data. The different sample sizes used in the estimations in this section compared to sections 4 and 5 comes about due to missing information on earnings for some individuals.

<sup>4</sup> The results from the earnings determination models of males and females are presented in Appendix D.

adjusted  $R^2$  value of 0.22 for the Population Reference group is higher than the 0.17 for the Jobseeker group. Thus, for Jobseekers unobserved characteristics (e.g. attitude, degree of motivation) play a larger role in determining the variation in earnings.

## 7.1 ORDINARY LEAST SQUARES RESULTS OF EARNINGS FOR THE POPULATION REFERENCE AND JOBSEEKER GROUPS, 1995

Variable	Population Reference group		Jobseeker group	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	2.224	25.05	2.080	37.49
<i>Educational attainment</i>				
Bachelor degree or higher	0.468	7.11	0.269	5.14
Undergraduate or associate diploma	0.358	5.77	0.195	4.07
Skilled vocational qualification	0.152	2.51	0.193	5.42
Basic vocational qualification	0.150	2.03	0.054	1.23
Attended highest level of secondary school	0.209	3.65	0.115	3.29
Left school aged 16 years and over	0.104	1.91	0.018	0.57
<i>General labour market experience</i>				
Experience (years)	0.042	7.33	0.030	8.63
Experience <sup>2</sup> /100	-0.086	-6.39	-0.060	-6.80
Duration of current job (years)	-0.003	-0.48	0.027	3.41
Duration of current job <sup>2</sup> /100	0.014	0.67	-0.061	-2.10
<i>English proficiency</i>				
Speaks English very well/well	-0.033	-0.55	0.012	0.22
Speaks English fairly well/not well/not at all	-0.079	-0.65	-0.169	-1.87
<i>Marital status</i>				
Separated/divorced/widowed	-0.146	-2.90	-0.038	-0.97
Never married	-0.084	-2.09	-0.055	-2.08
Female	-0.015	-0.49	-0.012	-0.53
Disability	-0.034	-0.89	-0.040	-1.69
<i>Birthplace</i>				
Born in main English-speaking country	0.023	0.35	-0.012	-0.20
Born in other country	-0.117	-1.36	-0.107	-1.34
Indigenous origin	-0.026	-0.36	0.089	1.24
Period of residence (years)	0.003	1.04	0.002	0.89
<i>Labour market history</i>				
Never worked	-0.129	-1.62	-0.171	-4.33
Looking for work since first left full-time education (years)	-0.010	-0.68	0.009	1.84
<i>Area of residence</i>				
Major urban	-0.049	-0.90	-0.029	-0.66
Other urban	-0.059	-1.18	-0.003	-0.12
Rural	-0.154	-3.58	-0.059	-1.91
Socioeconomic index for area of residence	0.005	0.98	0.0004	0.10
Public sector	0.015	0.46	0.080	2.55
Size of location 1-10 employees	-0.381	-8.45	-0.176	-6.18
Size of location 11-50 employees	-0.148	-4.12	-0.064	-2.14
Size of location 51-100 employees	-0.148	-3.46	-0.043	-1.18
F (30, 1 263)	13.09	..	..	..
F (30, 2 694)	..	..	19.40	..
Adjusted R <sup>2</sup>	0.22	..	0.17	..
Sample size	1 294	..	2 725	..
Weighted estimates ('000)	6 223.6	..	441.0	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980). The total figure differs from table 4.1 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

#### *Educational attainment*

The results in table 7.1 show that earnings are positively and significantly affected by educational attainment. For example, for the Population Reference and Jobseeker groups, individuals who have a bachelor degree or higher, a diploma or vocational qualifications receive higher earnings than those who left school at 15 years of age or younger. Moreover, the magnitudes of the estimated coefficients for the Population Reference group are broadly similar to those reported in previous studies (e.g. Preston 1997).

A comparison of earnings between members of the Population Reference group and Jobseekers reveals that the typical workers from the Population Reference group receive a higher return to schooling than Jobseekers. The difference in earnings between the two groups is most striking among those at the extreme levels of educational attainment. For example, the earnings gains for those who attended the highest level of secondary school are almost twice as high for members of the Population Reference group as they are for Jobseekers. In comparison, the earnings advantages for individuals who possess a skilled vocational qualification are similar for the Population Reference and Jobseeker groups. This is consistent with earlier findings that the occupational status of members of the Population Reference group and Jobseekers is similar when holders of skilled vocational qualifications are being compared. Therefore, among Jobseekers, attainment of specific skills appears to be very important to labour market success.

#### *Labour market experience*

The impact of labour market experience on earnings is significant for members of both the Population Reference and Jobseeker groups. For the Population Reference group, evaluated at ten years of labour market experience, an extra year of experience increases earnings by 2.5%, at 20 years the earnings increment is 0.8%, and after 24 years an additional year of labour market experience leads to a slight fall in earnings. This pattern of wage changes with the level of labour market experience is consistent with that reported in studies of the Australian labour market based on other data sets (e.g. Miller & Mulvey 1996; Preston 1997).

In comparison, the return to labour market experience for Jobseekers is lower. Thus, evaluated at ten years of labour market experience, an extra year in the labour market increases the earnings of Jobseekers by 1.8%, at 20 years the increase in earnings associated with an extra year of experience is 0.6%, and after 25 years the earnings of Jobseekers decline slightly with each additional year in the labour market. The crucial difference between Jobseekers and members of the Population Reference group in this regard may be the fact that the former may have recently been unemployed, underemployed or marginally attached to the labour market. This marginal attachment may have resulted in a devaluation of the Jobseekers' general skills that are reflected in the general labour market experience variable.

#### *Duration of current job*

While general labour market experience is an important determinant of earnings for members of both the Population Reference and Jobseeker groups, the impact of the duration of the current job on earnings yields conflicting results for these two groups. The results in table 7.1 show that the earnings of members of the Population reference group are not significantly influenced by the time they spent in the current job. This result differs from Miller and Mulvey's (1996) study. They report that at least for the first 23 years duration, earnings increase with duration of the current job, although the earnings increments in this regard are much lower than those associated with general labour market experience. In comparison, the duration of the current job is a significant determinant of earnings for Jobseekers. Thus, evaluated at ten years in the job, each additional year in that job increases the earnings of Jobseekers by 1.5%, at 20 years the increase in earnings associated with each additional year is 0.3% and after 23 years the earnings of Jobseekers decline with each additional year in the job. The magnitude of the increase in earnings associated with duration of the current job for Jobseekers is smaller than that associated with labour market experience. The result is consistent with previous Australian studies.

#### *Marital status*

The earnings of the Population Reference group and Jobseekers are influenced by marital status, and the general pattern of effects is broadly similar for the two groups. Hence, compared to a married person, those who are separated, divorced or widowed and those who have never married receive lower earnings.<sup>5</sup> This may reflect extra effort or higher productivity among married workers, or employers' preference for married workers over those who are not married.

#### *Area of residence*

In general, the area of residence plays a minor role in determining the earnings of both members of the Population Reference group and Jobseekers. The only area of residence variable that significantly affects earnings is that representing residence in a rural area. Specifically, individuals living in rural areas earn considerably less than those living in capital cities. Moreover, the relative difference in earnings between those living in the capital cities and those living in rural areas is much larger among the Population Reference group than among Jobseekers.

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5 When separate wage equations are estimated for males and females, the impacts of marital status on earnings differ for these two groups. Among males, there is no statistically significant difference at the 5% level between the earnings of those who are married (for members of the Population Reference or Jobseeker groups) and those who are separated/divorced/widowed, or those who have never married. Among females, there exists a wage differential between those who are married and those who have never married. Thus, for both members of the Population Reference group and Jobseekers, married women earn more than those who have never married. However, the earnings differential between married women and those who are separated/divorced/widowed are not statistically significant at the 5% level (see Appendix D).

#### Sector of employment

The sector of employment is a significant determinant of earnings for both the Population Reference and Jobseeker groups. For example, among members of the Population Reference group, the difference in earnings between those working in the public sector and those working in the private sector is 1.5%. The magnitude of the public/private sector earnings differential for the Population Reference group is broadly similar to that reported by Borland, Hirschberg and Lye (1998). For Jobseekers, those working in the public sector receive 8% higher wages than those working in the private sector. The magnitude of this coefficient is similar to the previous study of Miller and Mulvey (1996) but is greater than that reported in the study by Borland *et al.* (1998).

#### Size of location of employment

With regard to the size of location of employment, there exists a strong positive relationship between firm size and earnings. The direction of the relationship between firm size and earnings is broadly consistent with that reported in previous Australian studies by Miller (1994) and Miller and Mulvey (1996). For the Population Reference group, those working in smaller and medium-sized firms earn at least 15% less than those working in very large firms, though the earnings increment is much larger than that reported by Miller (1994) and Miller and Mulvey (1996). In comparison, for Jobseekers working in very large firms (i.e. those that hire more than 100 employees), those working in smaller firms earn at least 6% less. The magnitude of the impact of firm size on earnings for Jobseekers is similar to that reported by Miller (1994) and Miller and Mulvey (1996) for all workers.

#### Labour market history

Labour market history is shown in table 7.1 to have a relatively weak impact on earnings for both the Population Reference and Jobseeker groups. For the Population Reference group, individuals who had not worked prior to obtaining the current job earn 13% less than those who had worked previously, though this is just significant at the 10% level. With regard to the second measure of labour market history, the number of years the typical workers from the Population Reference group spent looking for work since they first left full-time education does not have a significant impact on earnings. The overall weak impact of labour market history on earnings of members of the Population Reference group is similar to that reported by Miller and Volker (1987).

For the Jobseeker group, compared to Jobseekers who had worked prior to obtaining the current job, those who had never worked earn 17% less. However, while the number of years the Jobseekers spent looking for work since they first left full-time education significantly affects earnings at the 10% level, the impact of this factor is relatively weak, being less than 1%. The latter result is consistent with that reported by Miller and Volker (1987) regarding the links between previous unemployment experience and earnings.

In summary, the results from this brief study of the determination of earnings in the Australian labour market of the mid-1990s show that personal characteristics (e.g. educational attainment, labour market experience, marital status) and structural factors (e.g. employment sector, size of location of employment) have important influences on the earnings determination process. However, some differences in the wage structures of the Population Reference and Jobseeker groups are apparent. For example, the returns to educational attainment and labour market experience for Jobseekers are lower than those for the Population Reference group. These differential returns to human capital skills may affect the workers' perceptions of job quality, as these perceptions pertain to wages as a measure of job quality. These issues will be examined in a later subsection.

#### CREATING A JOB QUALITY VARIABLE USING WAGES

Similar to the approach outlined in section 4, the estimates from the earnings function (13) can be used to generate a relative measure of job quality. This involves combining the estimates obtained from the earnings model for members of the Population Reference group ( $\hat{\delta}^G$ ) with the characteristics of the Jobseeker group ( $Z_i^J$ ). These values are then used to generate the wage that the Jobseekers would have obtained if they were treated in the labour market in exactly the same way as workers from the Population Reference group. Hence, let

$$\hat{W}_i^J = \hat{\delta}^G Z_i^J \quad (14)$$

be the natural logarithm of the hourly wage rate that a Jobseeker would have received if treated the same as a member of the Population Reference group. Let  $WH_i^J$  be the natural logarithm of the actual hourly wage rate of a Jobseeker. If

$$\hat{W}_i^J > WH_i^J$$

then the Jobseeker is under-achieving, given his or her productivity-related characteristics. Individuals in this situation could be categorised as having a poor quality job. If

$$\hat{W}_i^J \leq WH_i^J$$

then the Jobseeker is performing as well or better than what is expected, given his or her productivity related-characteristics. Individuals in this situation would be categorised as having good jobs.

The measure of the quality of jobs can be again generalised by incorporating a threshold of assessment into the job categorisation. A poor job might be defined as one where

$$\hat{W}_i^J - WH_i^J > w$$



and a good job is where

$$\hat{W}_i^J - WH_i^J \leq w$$

where  $w$  is the threshold of the hourly wage that is imposed on the analysis. The threshold of the hourly wage is chosen in a way that will generate the same percentage (39%) of Jobseekers with poor jobs as was obtained from the models of occupational attainment.

The impact of job quality on job tenure will be examined in two parts.<sup>6</sup> The first part presents results from the logit model of job tenure. In the second part results from the parametric duration models will be discussed.

## LOGISTIC ANALYSES OF JOB TENURE

The link between job quality and simple binary indicators of the quality of the job match will be examined using the logit model (equation 10). Several issues regarding the modelling procedure need to be reviewed. First, as with the previous study of job tenure, two dependent variables for job match are created for use in the logit model of job tenure, namely a binary variable indicating if the job has lasted six months or more and a binary variable indicating if the job has lasted 12 months or more. The second issue relates to the measure of job quality. Two measures of job quality will be used, namely an absolute measure (termed 'hourly wage') and a relative measure computed as the difference between a worker's expected and actual earnings (termed 'poor job').

### *Goodness of fit*

For jobs that lasted six months or more, the results from the logit model are presented in table 7.2.<sup>7</sup> The overall goodness of fit of this model is similar in terms of magnitude and significance to that reported in table 6.1. For example, the  $\chi^2$  statistic indicates that the variables included in the model are jointly significant in explaining changes in the probability of obtaining successful job matches. The McFadden  $R^2$  of 0.07 is relatively low for this type of estimation and suggests that factors not observed by researchers are also quite important. The remainder of this discussion focuses on the impacts of observed factors on successful job matches. Given that the model estimated differs from that presented in section 6 only in respect to the way the job quality variable has been constructed (using data on wages in place of the occupational status score) it might be expected that the main findings would be the same as

6 It should be noted that the job tenure model is estimated on the sample with valid earnings data. Hence, the samples for the Population Reference and Jobseeker groups used in the estimation of these job tenure models differ from those used in section 6.

7 The results for the job tenure model which excludes the job quality variable are presented in Appendix E.

reported in the earlier sections. However, the current analyses are restricted to those who have valid data on wages (90% of the earlier sample) and it will be of interest to establish whether the results are sensitive to this change in the data set. Hence, detailed comments will be provided.

## 7.2 LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS HAVING JOBS THAT LASTED SIX MONTHS OR MORE

Variable	Coefficient	t-ratio	$\partial T / \partial X_k(a)$
Intercept	0.001	0.01	
<i>Educational attainment</i>			
Bachelor degree or higher	0.324	1.86	8.07
Undergraduate or associate diploma	0.119	0.62	2.96
Skilled vocational qualification	0.392	2.76	9.76
Basic vocational qualification	0.358	1.94	8.92
Attended highest level of secondary school	0.187	1.40	4.66
Left school aged 16 years and over	0.095	0.75	2.37
<i>General labour market experience</i>			
Experience (years)	0.037	2.68	0.92
Experience <sup>2</sup> /100	-0.052	-1.40	-1.30
<i>English proficiency</i>			
Speaks English very well/well	-0.478	-2.45	-11.90
Speaks English fairly well/not well/not at all	-0.180	-0.61	-4.48
<i>Marital status</i>			
Separated/divorced/widowed	-0.006	-0.04	-0.15
Never married	0.077	0.73	1.92
Female	0.197	2.27	4.91
Disability	-0.210	-2.23	-5.23
<i>Birthplace</i>			
Born in main English-speaking country	-0.040	-0.19	-1.00
Born in other country	0.332	1.30	8.27
Indigenous origin	0.269	1.09	6.70
Period of residence (years)	-0.006	-0.82	-0.15
<i>Labour market history</i>			
Never worked	-1.254	-7.71	-31.23
Looking for work since first left full-time education (years)	-0.151	-7.20	-3.76
<i>Area of residence</i>			
Major urban	-0.043	-0.24	-1.07
Other urban	-0.053	-0.51	-1.32
Rural	-0.091	-0.74	-2.27
Socioeconomic index for area of residence	0.010	0.65	0.25
Public sector	0.070	0.54	1.74
Size of location 1–10 employees	-0.204	-1.77	-5.08
Size of location 11–50 employees	-0.130	-1.08	-3.24
Size of location 51–100 employees	-0.151	-0.92	-3.76
<i>Job quality</i>			
Hourly wage	0.013	2.40	0.32
$\chi^2$ (29)	259.97	..	..
McFadden $R^2$ (b)	0.07	..	..
Sample size	2 725	..	..
Weighted estimates ('000)	441.0	..	..

(a) This column lists the partial effect of an exogenous variable on the probability of having a job that has lasted for six months or more.

(b) The McFadden  $R^2$  is calculated as  $1 - (l_m / l_o)$ , where  $l_m$  = the maximised log-likelihood value of the model and  $l_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996). The total figure differs from table 6.1 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

### *Educational attainment*

With regard to individual-related characteristics, the table 7.2 results show that educational attainment plays a minor role in determining whether Jobseekers are successfully matched to the current job. For example, with the exception of the bachelor degree or higher and vocational qualification variables, the education variables do not have significant influences, at the 10% level or higher, on the chances of the job match being successful. The positive impact of vocational qualifications on the chances of obtaining a successful job match reinforces the proposition that accumulation of specific skills can help reduce job churning among Jobseekers. The links between educational attainment and job tenure in the table 7.2 results are slightly stronger than those presented in table 6.1, although the differences in this regard are not statistically significant.

### *English proficiency, sex, disability, labour market experience, labour market history*

The results in relation to English proficiency, sex, disability and labour market history are in accord with those presented in table 6.1, both in relation to the direction and statistical significance of the estimated effects. For example, English proficiency (those who speak English very well/well), disability and labour market history variables have negative effects on the chances of the job match being successful, and sex (female) has a positive effect on the chances of the job match being successful. While the relationship between labour market experience and the probability of securing a successful job match is dominated by the non-linear term, the partial effect of experience on obtaining a successful job match is similar to that reported in table 6.1.

### *Job quality*

The table 7.2 results also show that the absolute measure of job quality given by the wage of the job has a positive and significant impact on the probability of having a successful job match.<sup>8</sup> Therefore, Jobseekers who are working in jobs with high wages are more likely to be successfully matched to the current job and so are less likely to leave their jobs and be part of the job churning process. It is observed that the impact of the hourly wage coefficient is reasonably modest, and a \$1 increase in the hourly wage results in an increase in the probability of a successful job match by less than 0.5 percentage points. It would take about a \$25 wage increase to have the same impact on the probability of the job match being successful as possession of a vocational qualification. A comparison of elasticities for the hourly wage and the ANU3 status score

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<sup>8</sup> For members of the Population Reference group, their chances of being successfully matched to the current job are not significantly affected by the quality of the job.

reported in table 6.1 shows that both absolute measures of job quality have weak (elasticities of about 0.07) effects on the probability of obtaining a successful job match.<sup>9</sup>

*Alternative model of job tenure*

To further examine the impact of variations in pecuniary compensation on job tenure, table 7.3 presents results for when the relative measure of job quality, computed as the difference between a worker's expected and actual earnings, is included in the estimating equation. Overall, the results associated with the personal and job-related characteristics (e.g. labour market experience, English proficiency, sex and disability) and with the employment history variables are similar to those reported in table 7.2 and in the comparable exercise conducted in section 6. However, educational attainment has a stronger impact on the probability of there being a successful job match. For example, compared to Jobseekers who left school before their 16th birthday, those who have a bachelor degree or higher, or those who have vocational qualifications, are at least 10 percentage points more likely to be successfully matched to the current job.

*Relative measure of job quality*

The impact of the relative measure of job quality on the chances of there being a successful job match is negative and significant.<sup>10</sup> This is consistent with the hourly wage measure reported in table 7.2. The result suggests that the characteristics of individuals who fill the job are important. In other words, a highly skilled person working in a low-wage job is much more likely to leave the job than a low-skilled individual working in the same job.

A comparison between the relative job quality measure based on earnings (table 7.3) and on occupational status (table 6.2) reveals several important differences. First, pecuniary compensations appear to play a larger role than non-pecuniary compensations in the job matching process. For example, the elasticities with respect to the relative earnings and relative occupational status measures are  $-0.08$  and  $-0.04$ , respectively. This result can be

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9 Given the different units of measurement for the wage and status attainment variables, a comparison of the estimated impacts is undertaken using the unit-free elasticity concept, given by the partial effect on the probability of holding a job for six months or more with respect to the variable in question (either wages or the status attainment score) multiplied by the ratio for the mean of the variable in question to the fraction of the sample holding jobs for six months or more.

10 In contrast, the relative wage does not have a significant influence on the chances that the typical worker from the Population Reference group will be successfully matched to the current job.

interpreted as follows: a 10% increase in the gap between the predicted and actual earnings will result in a 0.8% decrease in the probability of having a successful job match. Likewise, a 10% increase in the gap between the predicted and actual occupational status scores will result in a 0.4% decrease in the probability of the job match being successful. Second, workers appear to respond differently to pecuniary and non-pecuniary rewards. With regard to pecuniary rewards, Jobseekers seem to compare the earnings they receive on the job with their skills. In comparison, with non-pecuniary rewards Jobseekers appear to place greater emphasis on the absolute level of the occupational prestige of the job. These differences suggest that as Jobseekers are more responsive to relative pecuniary rewards, one avenue for obtaining successful job matches would be to allocate Jobseekers to jobs that best reward them for their skills.<sup>11</sup> The differential in the way workers react to the pecuniary and non-pecuniary aspects of the job may simply be a reflection of the knowledge workers have. Knowledge of what is an appropriate rate of pay for a given set of qualifications and experience is likely to be easier to acquire than knowledge of the appropriate level of occupational prestige for the same set of worker characteristics.

#### Summary

In summary, several features of the above results are of particular importance. First, the impacts of personal and job-related characteristics on the job match process are reasonably robust across model specifications. Second, the impact of job quality on the chances of there being a successful job match appears to be sensitive to the definition of job quality used. More specifically, while the results for the absolute measures of job quality are robust across the two definitions of job quality explored, the results for the relative measures of job quality differ across definitions. For example, the impact of relative job quality, measured as the difference between a worker's expected and actual occupational status, on the chances of a successful job match is ambiguous.

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<sup>11</sup> To test the robustness of the results presented the more stringent criterion for a good job match examined in section 6 was also used. In this case the dependent variable is a binary indicator that distinguishes jobs that lasted at least 12 months from all other jobs. Overall, the results are consistent with those reported in table 7.2 and with the comparable exercises in section 6. However, educational attainment has a stronger impact on job matches than was presented in tables 6.3 and 7.2. With regard to the absolute measure of job quality based on the hourly wage rate, the results show that Jobseekers working in high-paying jobs are more likely to remain in those jobs for at least 12 months. A comparison between the impacts of the hourly wage and the ANU3 status score (table 6.3) on successful job matches reveals that these variables have similar impacts. In comparison, the results for the relative measures of job quality show that job quality, measured as the difference between expected and actual earnings, has a larger impact on there being a successful job match than job quality, measured as the difference between expected and actual occupational status.

## 7.3

### LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS HAVING JOBS THAT LASTED SIX MONTHS OR MORE, ALTERNATIVE MEASURE OF JOB QUALITY

Variable	Coefficient	t-ratio	$\partial T / \partial X_k(a)$
Intercept	0.330	1.50	—
<i>Educational attainment</i>			
Bachelor degree or higher	0.430	2.48	10.71
Undergraduate or associate diploma	0.194	1.01	4.83
Skilled vocational qualification	0.400	2.81	9.96
Basic vocational qualification	0.409	2.20	10.19
Attended highest level of secondary school	0.249	1.85	6.20
Left school aged 16 years and over	0.126	0.99	3.14
<i>General labour market experience</i>			
Experience (years)	0.045	3.26	1.12
Experience <sup>2</sup> /100	-0.069	-1.84	-1.72
<i>English proficiency</i>			
Speaks English very well/well	-0.498	-2.55	-12.40
Speaks English fairly well/not well/not at all	-0.191	-0.64	-4.76
<i>Marital status</i>			
Separated/divorced/widowed	-0.065	-0.43	-1.62
Never married	0.059	0.55	1.47
Female	0.211	2.42	5.25
Disability	-0.217	-2.30	-5.40
<i>Birthplace</i>			
Born in main English-speaking country	0.027	0.13	0.67
Born in other country	0.313	1.22	7.79
Indigenous origin	0.284	1.15	7.07
Period of residence (years)	-0.006	-0.71	0.15
<i>Labour market history</i>			
Never worked	-1.267	-7.76	-31.55
Looking for work since first left full-time education (years)	-0.153	-7.31	-3.81
<i>Area of residence</i>			
Major urban	-0.029	-0.16	-0.72
Other urban	-0.071	-0.69	-1.77
Rural	-0.144	-1.17	-3.59
Socioeconomic index for area of residence	0.013	0.88	0.32
Public sector	0.080	0.62	1.99
Size of location 1–10 employees	-0.331	-2.83	-8.24
Size of location 11–50 employees	-0.186	-1.54	-4.63
Size of location 51–100 employees	-0.225	-1.36	-5.60
<i>Job quality</i>			
Poor job	-0.450	-5.24	-11.21
$\chi^2$ (29)	279.43	..	..
McFadden R <sup>2</sup> (b)	0.07	..	..
Sample size	2 725	..	..
Weighted estimates ('000)	441.0	..	..

(a) This column lists the partial effect of an exogenous variable on the probability of having a job that has lasted for six months or more.

(b) The McFadden R<sup>2</sup> is calculated as  $1 - (l_m / l_o)$ , where  $l_m$  = the maximised log-likelihood value of the model and  $l_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996). The total figure differs from table 6.2 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

In contrast, the impact of relative job quality measured as the difference between a worker's expected and actual earnings on the chances of a successful job match is unambiguous. Moreover, the relative measure of job quality based on earnings has a much larger impact on the probability of the job match being successful than the relative measure of job quality based on occupational status. Third, the magnitudes of the impacts of the absolute and relative measures of job quality on the chances that Jobseekers are successfully matched to the current job are sensitive to the definition of successful job matches used. It appears that job quality has a stronger impact on the probability of matching Jobseekers to jobs that last 12 months or more than jobs that last six months or more.

Overall, these results suggest that while absolute pecuniary and non-pecuniary compensations are significant determinants of whether the job match is successful, they have relatively weak influences on the Jobseeker's decision whether to continue working in the job. In contrast, relative earnings has a much more powerful influence on the chances of the job match being successful than relative occupational status, suggesting that pecuniary rewards and the quality of the individuals holding the job should both be considered when evaluating job churning.

## RESULTS FROM PARAMETRIC DURATION MODELS

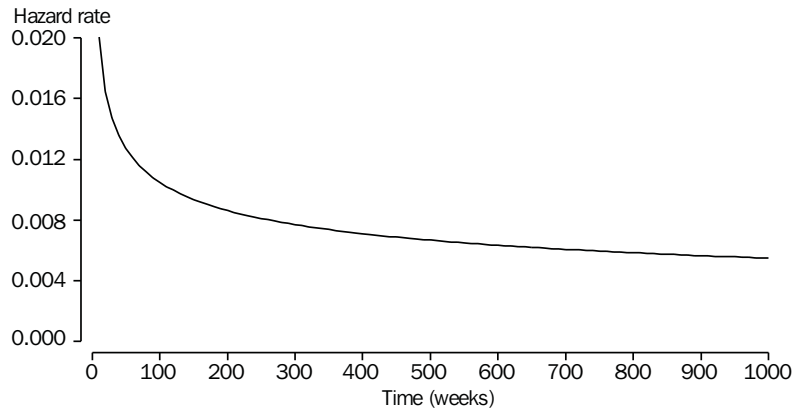
A further comparison of the impacts of pecuniary and non-pecuniary compensations on job tenure can be gained through estimation of the parametric duration models. The results for the Weibull hazard model are presented in table 7.5.<sup>12</sup> As was reported in the previous section, the Weibull shape parameter ( $\beta$ ) is less than one, indicating that the longer the Jobseekers have been working, the less likely it is that they will leave that job in any given time period.<sup>13</sup> The hazard rate function portrayed in graph 7.4 shows this clearly. Similar to the results reported in section 6 (see graph 6.4), the hazard rate declines sharply over the first few years but tapers off after five years. For example, the conditional probability that the Jobseeker will leave the current job after ten weeks is 2.0%, after 20 weeks it is 1.6% and after five years the probability of leaving the current job is 0.8%.

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12 The results for the Weibull hazard model that excludes the job quality variable are presented in Appendix E.

13 In contrast, the Weibull shape parameter for the Population Reference group is greater than one, which indicates that the duration data are characterised by increasing duration dependence. For example, the probability of exiting the current job after ten weeks is 0.09 percent and after 39 years the probability of leaving the current job is 0.17 percent.

#### 7.4 ESTIMATED HAZARD FUNCTION FOR JOBSEEKERS



*Effects of covariates other than hourly wage*

In section 6 it was established that educational attainment, labour market experience, marital status, sex, disability, labour market history and the size of location of employment have significant, though modest, impacts on job tenure in the context of the Weibull model. In general, most of these findings carry over to the current analysis. However, some changes are observed. First, educational attainment has a stronger impact on job tenure in the current analysis compared to that reported in the job tenure model in section 6 (see table 6.5).<sup>14</sup> Second, marital status and disability have weaker impacts on job tenure in the current analysis. Third, public sector employment has a stronger effect on job tenure in the current analysis than in a comparable exercise in section 6.<sup>15</sup>

*Hourly wage*

The quality of the job has a positive and significant impact on job tenure.<sup>16</sup> Thus, Jobseekers earning higher wages are more likely to continue working in the same job over time. This result is consistent with the positive and significant relationship between the ANU3 status attainment score and job tenure reported in table 6.5. The robustness of the two absolute measures of job quality suggests that pecuniary and non-pecuniary compensations both offer important incentives for Jobseekers when deciding whether to continue working in the same job over time.

<sup>14</sup> To test whether these differences are due to the change in the sample or the change in the variable used to measure job quality, the ANU3 score is included in the job tenure model in place of the hourly wage while keeping the composition of the sample constant. The results show that educational attainment has a relatively weak impact on job tenure. Hence, it appears that the difference between educational attainment in the current analysis and that in the comparable exercise in section 6 is due, in the main part, to the different measures of job quality.

<sup>15</sup> The experiments show that these changes are more likely to be due to the change in the sample than due to a change in the way job quality has been measured.

<sup>16</sup> Although the relationship between the hourly wage and job tenure is positive, it is not statistically significant for the Population Reference group.



## 7.5

### ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS

Variable	Coefficient	t-ratio
Intercept	3.493	22.83
<i>Educational attainment</i>		
Bachelor degree or higher	0.264	2.35
Undergraduate or associate diploma	0.210	1.79
Skilled vocational qualification	0.338	3.72
Basic vocational qualification	0.168	1.31
Attended highest level of secondary school	0.267	2.99
Left school aged 16 years and over	0.165	1.93
<i>General labour market experience</i>		
Experience (years)	0.063	7.08
Experience <sup>2</sup> /100	-0.042	-1.89
<i>English proficiency</i>		
Speaks English very well/well	-0.103	-0.88
Speaks English fairly well/not well/not at all	-0.127	-0.65
<i>Marital status</i>		
Separated/divorced/widowed	-0.033	-0.35
Never married	0.102	1.48
Female	0.190	3.23
Disability	-0.049	-0.80
<i>Birthplace</i>		
Born in main English-speaking country	0.029	0.19
Born in other country	0.124	0.72
Indigenous origin	-0.128	-0.65
Period of residence (years)	-0.103	-1.51
<i>Labour market history</i>		
Never worked	-0.727	-7.47
Looking for work since first left full-time education (years)	-0.089	-9.88
<i>Area of residence</i>		
Major urban	0.076	0.60
Other urban	-0.076	-1.16
Rural	-0.080	-0.10
Socioeconomic index for area of residence	0.015	1.55
Public sector	0.194	2.23
Size of location 1–10 employees	-0.311	-4.06
Size of location 11–50 employees	-0.201	-2.52
Size of location 51–100 employees	-0.177	-1.59
<i>Job quality</i>		
Hourly wage	0.009	4.19
Sample size(a)	2 725	..
Weighted estimates ('000)	441.0	..

(a) The total figure differs from table 6.5 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

#### *Relative measure of job quality*

An alternative job tenure model was estimated which includes the relative measure of job quality derived from the wage equations. The results in table 7.6 show that Jobseekers who are working in poor jobs have less chance of continuing in the same job over time.<sup>17</sup> It is observed that the elasticity of job tenure with respect to the poor job (-0.16) variable is larger than that of the hourly wage (0.10). Moreover, the elasticity of the

<sup>17</sup> For the Population Reference group, the quality of the job does not significantly affect the time spent by workers in that job.

poor job variable created from the differential between expected and actual earnings is greater than the elasticities of the poor job variables created from the ordinary least squares (-0.04) and ordered probit occupational status (-0.08) models (see table 6.6). This result has several implications. First, given that the relative measure of job quality (from a pecuniary compensation viewpoint) has a stronger impact on job tenure than an absolute pecuniary measure of job quality, the extent of job churning can be reduced by allocating workers to jobs according to their characteristics, rather than relying totally on the pecuniary benefits of the job itself. Second, it appears that relative pecuniary benefits, in general, outweigh non-pecuniary benefits in terms of the decision-making process involved when changing jobs. Therefore, attempts to reduce job churning among Jobseekers should recognise that Jobseekers will be more responsive to relative pecuniary rewards rather than non-pecuniary rewards of the job.<sup>18</sup>

#### Summary

In summary, two important results are obtained from the above models of job tenure. First, the results relating to individual characteristics (e.g. educational attainment, English proficiency, sex, disability), labour market experience, labour market history, employment sector and the size of the location of employment are reasonably robust across model specifications. Second, the results provide unambiguous support for the link between job churning and job quality. Jobseekers who are working in poor jobs are more likely to leave that job, *ceteris paribus*. Of particular importance is the role of pecuniary benefits in reducing job churning among Jobseekers. It has been established that the relative wage-based measure of job tenure has a strong influence on job churning. This suggests that allocating workers to the right job involves not just looking at the job itself but also at the characteristics of the workers who fill the job.

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18 A duration model was also estimated using Ordinary Least Squares for Jobseekers who had left the job. Overall, the results associated with the individual's characteristics (e.g. educational attainment, English proficiency, marital status, sex), the labour market experience variable, the labour market history variables, and the size of the location of employment variable are consistent in terms of magnitude and significance with those reported in a comparable exercise in tables 6.7 and 6.8. Of particular importance are the significant influences of the job quality variables (absolute and relative measures) on job tenure. For example, there is a positive relationship between the hourly wage and job tenure, and a negative relationship between having a poor job and job tenure. These results confirm the robustness of the job quality variable as an important determinant of job tenure. Moreover, the results strongly suggest that high pecuniary benefits relative to the skills of Jobseekers are one of the means through which job churning can be reduced.

## 7.6

### ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS, ALTERNATIVE MEASURE OF JOB QUALITY

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	3.744	25.01
<i>Educational attainment</i>		
Bachelor degree or higher	0.327	2.91
Undergraduate or associate diploma	0.273	2.35
Skilled vocational qualification	0.324	3.62
Basic vocational qualification	0.210	1.66
Attended highest level of secondary school	0.306	3.43
Left school aged 16 years and over	0.165	1.96
<i>General labour market experience</i>		
Experience (years)	0.070	7.83
Experience <sup>2</sup> /100	-0.058	-2.57
<i>English proficiency</i>		
Speaks English very well/well	-0.104	-0.89
Speaks English fairly well/not well/not at all	-0.088	-0.46
<i>Marital status</i>		
Separated/divorced/widowed	-0.092	-0.99
Never married	0.100	1.47
Female	0.215	3.68
Disability	-0.060	-0.99
<i>Birthplace</i>		
Born in main English-speaking country	0.100	0.66
Born in other country	0.093	0.54
Indigenous origin	-0.101	-0.58
Period of residence (years)	-0.007	-1.42
<i>Labour market history</i>		
Never worked	-0.747	-7.59
Looking for work since first left full-time education (years)	-0.088	-9.90
<i>Area of residence</i>		
Major urban	0.087	0.69
Other urban	-0.077	-1.17
Rural	-0.053	-0.69
Socioeconomic index for area of residence	0.018	1.81
Public sector	0.192	2.20
Size of location 1-10 employees	-0.412	-5.41
Size of location 11-50 employees	-0.249	-3.14
Size of location 51-100 employees	-0.233	-2.09
<i>Job quality</i>		
Poor job	-0.399	-7.20
<i>Sample size(a)</i>	2 725	..
<i>Weighted estimates ('000)</i>	441.0	..

(a) The total figure differs from table 6.6 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

## SECTION 8

## CONCLUSION

The unemployment rate in the Australian labour market is currently over 7%. As a result a large segment of the population experiences considerable economic and social hardship. One of the major concerns is the recurring unemployment of the same group of people over time. This occurs when individuals who had been unemployed are employed for a short period of time and then return to the pool of unemployment. This phenomenon is referred to as job churning. Identifying the causes of job churning could enable the problems of job loss among workers with a marginal attachment to the labour market to be addressed in labour market programmes aimed at alleviating some of the problems associated with chronic unemployment.

The job churning process in the Australian labour market was examined in this study for the period 1995 to 1997 with respect to the Jobseeker group from the Survey of Employment and Unemployment Patterns. A review of the data reveals several differences in the labour market performance of Jobseekers and a benchmark group of workers from the Population Reference group. First, a lower percentage of Jobseekers worked between 1995 and 1997 than was the case for members of the Population Reference group. Hence, even in the third year over which the Jobseekers were followed in the Survey, only 67% worked. In comparison, 81% of individuals in the Population Reference group worked in the same period. Second, among individuals who worked during the three-year period, there is a higher percentage of Jobseekers who had more than one job compared to members of the Population Reference group. For example, in 1997 31% of the Jobseekers had more than one job compared to 24% of workers from the Population Reference group. Third, the average duration of the job held by Jobseekers is considerably less than that held by workers from the Population Reference group. For example, in 1997 the average duration of work for Jobseekers was only 182 days compared to 276 days for the typical workers in the Population Reference group.

A detailed analysis of the labour market activity of a number of randomly selected individuals revealed the considerable labour market dynamics behind these average figures. It showed that Jobseekers generally have a number of short episodes of work interspersed with lengthy periods of specialist job search. Moreover, there does not appear to be much improvement over time in job stability. Hence, the problem for many of the unemployed is not only that it takes them a considerable period of time to find a job, but the jobs they find typically last for only a short period, after which they return to the pool of unemployment. Reducing the burden of unemployment for many workers therefore will require both increasing the chances that they can find work and reducing the chances that they will leave any job they find. This job turnover may be caused by the lack of skills that make Jobseekers unsuitable for the job, or it may arise because the quality of the job held by Jobseekers is often 'poor'. Both factors were examined in this study.

There are a number of ways of measuring job quality. One approach used in this study is to base the measurement on both the pecuniary and non-pecuniary rewards in the job. Another approach used entails a focus on only the pecuniary rewards associated with the job.

Information on an encompassing measure of both the pecuniary and non-pecuniary rewards in the job was obtained through study of the occupational achievements of workers. Two modelling procedures were considered. Under the first a summary measure of the general goodness of the occupation provided by the ANU3 status score was analysed. In the second procedure the distribution of workers across occupations was considered.

Two measures of job quality were examined as part of the study based on the occupational status scores. First, an absolute scale of job quality was created from the ANU3 status score. This measure captures the general 'goodness' of the job. The mean values of the ANU3 scale for Jobseekers and the Population Reference group are 22 and 32 points, respectively. This suggests that Jobseekers occupy jobs that have, on average, lower occupational prestige than the jobs held by the typical members of the general population. About 80% of the occupational status differential between the Population Reference and Jobseeker groups was shown to be attributable to the inferior endowments of Jobseekers. Second, a relative measure of job quality was computed as the difference between a worker's expected and actual occupational status. To categorise jobs as 'good' or 'poor', a model of occupational status was estimated. The findings show that individuals with high occupational status scores are those who are well educated, have general as well as firm-specific skills, are proficient in English, have spent little time looking for work and reside in areas with a high value of the socioeconomic index. Estimates of the model of occupational status obtained for the Population Reference group were combined with the characteristics of Jobseekers to generate the occupational status scores that members of the Jobseeker group would have obtained if they were treated in the labour market in exactly the same way as the benchmark group of workers from the Population Reference group. Then individuals were categorised as having poor jobs if they were working in jobs which had a predicted occupational status score at least five points higher than their actual occupational status score. Using this algorithm, 39% of Jobseekers were argued to be in poor jobs.

The alternative approach to comparing the labour market performance of workers from the Population Reference and Jobseeker groups involves an examination of the occupational distributions of the two groups. It is found that Jobseekers are crowded into the occupations that are generally regarded as inferior. Indeed, for Jobseekers to gain a distribution across occupations the same as workers from the Population Reference group 31% of them would need to shift across occupations. To examine the origins of this divergence between the two occupational distributions, the occupational distribution which would be expected to be observed when Jobseekers are distributed across occupations in the

same manner as the members of the Population Reference group was computed. Ordered probability models of occupational outcomes were used in this exercise. The 'equal treatment' occupational distribution reveals that there is a relatively high representation of members of the Population Reference group in the most prestigious occupations and a relatively high representation of Jobseekers in the least prestigious occupations. For example, even when Jobseekers are treated in the labour market in the same manner as members of the Population Reference group, only 11% would be employed as managers and administrators or professionals compared to the 23% of the Population Reference group employed in the same occupations. In contrast, 35% of Jobseekers are employed as either elementary clerical, sales and service workers or as labourers and related workers. Only 19% of the Population Reference group are employed in these occupations.

A large part of the difference in occupational status between Jobseekers and the Population Reference group is established in the study as being due to the inferior endowments of Jobseekers. However, part of the difference in the occupational status of Jobseekers and workers in the Population Reference group is shown to be due to underachievement on the part of Jobseekers. Whether this underachievement reduces the chances that Jobseekers will continue in the same job at any point in time was examined using job tenure models.

Several models of job tenure were estimated in this study, an approach that permits the robustness of the empirical findings to be assessed. Thus, logit models of binary indicators of whether the job match was successful, parametric job duration models and Ordinary Least Squares estimation of completed job tenure were considered. In terms of the covariates other than the job quality variables, the results show that the influences of human capital characteristics and structural factors on job tenure are relatively weak. In comparison, the labour market experience and labour market history variables are strong determinants of job tenure. For example, the results from the logit models show that compared to Jobseekers who had worked prior to obtaining the current job, those who had never worked prior to obtaining the current job are 30 percentage points less likely to have a successful job match. This could arise where labour market entrants engage in job shopping and, consequently, they experience high job turnover compared to those who had worked previously.

The absolute measure of job quality given by the occupational status attainment score has a highly significant influence on job tenure. For example, the results from the logit models of binary indicators of whether the job match was successful show that, *ceteris paribus*, Jobseekers with high occupational status scores (i.e. those who have good jobs) are more likely to be successfully matched to the job. Similarly, the results from the parametric job duration models show that workers in occupations having a relatively high occupational status are less likely to leave their job at any given point in time and so have

longer job tenure, *ceteris paribus*. These findings carry over when models of job tenure were estimated using Ordinary Least Squares for the subset of Jobseekers who had left their jobs.

In comparison, the relative job quality variables, computed as the difference between a worker's expected and actual occupational status (termed 'poor job'), are shown to have ambiguous effects on job tenure. For example, the results from the logit models of a binary indicator of whether the job match was successful (i.e. of the probability of working in a job that lasts six months or more) show that the poor job variable constructed from the occupational status model is insignificant, while the poor job variable constructed from the ordered probit model of occupational outcomes is significant. These findings carry over when a more stringent criterion for a good job match involving selecting jobs lasting 12 months or more was used. They also carry over when models of job tenure were estimated using Ordinary Least Squares for the subset of Jobseekers who had left the job. However, the poor job variable constructed from the model explaining the status attainment scores and that derived from the ordered probit model of occupational outcomes are both significant in parametric models of job duration. The inconsistent nature of the findings for the relative job quality variables and the consistent results for the absolute job quality variable imply that it is the absolute dimension of the job, as measured by the ANU3 score, that is the more important factor in influencing job turnover.

With respect to the pecuniary aspects of the job, both an absolute scale given by the hourly wage and a relative scale computed as the difference between a worker's expected wage and actual wage, were used. To construct the relative scale, earnings functions were estimated to provide information on the determinants of earnings in the Australian labour market. The data show that workers from the Population Reference group receive, on average, a higher hourly wage (\$15.67) than do Jobseekers (\$11.41). This earnings differential can be explained by a number of factors. Results from the earnings function show that earnings are significantly influenced by educational attainment, labour market experience, the duration of the current job, marital status, labour market history, sector of employment and the size of the location of employment. For example, compared to the benchmark group of Jobseekers who left school at 15 years of age or younger, Jobseekers who had completed high school, those who possess a skilled vocational qualification, an undergraduate or associate diploma, and those who have a bachelor degree or higher, earn 12%, 19% and 27% more, respectively. These results are consistent with previous studies of the Australian labour market. However, it is observed that the returns to educational attainment and labour market experience for Jobseekers are much lower than those for members of the Population Reference group.

The relative measure of job quality was constructed by combining the estimates of the earnings function for the Population Reference group with the characteristics of Jobseekers. This permitted the computation of the hypothetical earnings that Jobseekers would receive if they were

treated in the labour market in exactly the same way as members of the Population Reference group are treated. Jobseekers were categorised as having poor jobs if their 'equal treatment' earnings are greater than their actual earnings.

The results from analysis of the determinants of job tenure using measures of pecuniary benefits reveal some differences for covariates other than the job quality variable in comparison to models based on the encompassing measures of both pecuniary and non-pecuniary rewards. For example, educational attainment and sector of employment have stronger impacts on job tenure in the job tenure models using measures of pecuniary benefits than in the job tenure models using the job quality variables constructed from the occupational status attainment scores. In contrast, marital status and disability have weaker effects on job tenure in job duration models using measures of pecuniary benefits than in job duration models using the alternative, wider definition of job quality. For educational attainment it appears that the difference is due, in the main part, to the different measures of job quality, while the changes in the other variables mentioned are more likely due to the change in the sample necessitated when using the wage data in the Survey.

With respect to the job quality variables based on pecuniary measures, the results show that these are important, statistical determinants of job tenure. For example, the results from the logit models of binary indicators of whether the job match was successful show that Jobseekers who are working in jobs with high wages are more likely to be successfully matched to the job. However, an examination of the elasticity for the hourly wage reveals that this absolute measure of job quality has a relatively weak effect (elasticity of about 0.07) on the probability of obtaining a successful job match. This impact is similar to that computed for the ANU3 status attainment score. The relative measure of job quality constructed from the study of earnings has a much stronger influence on the chances of the job match being successful. For example, Jobseekers working in poor jobs are 11 percentage points less likely to work in a job that lasts more than six months.

Similar results were obtained regarding the impact of job quality on job turnover when parametric duration models were estimated. For example, Jobseekers who receive higher wages are less likely to leave that job at any given point in time. Conversely, Jobseekers who are working in poor, low-wage jobs are less likely to continue working in the same job at any given point of time. It is observed that the elasticity of job tenure with respect to the poor job variable is much larger than that with respect to the hourly wage. In addition, the elasticity of the poor job variable created from the differential between expected and actual earnings is much larger than the elasticities of the poor job variables created from the ANU3 status attainment score and the ordered probit model of occupational outcomes.



There are a number of important implications of these findings. First, a large proportion of the difference in the occupational status of members of the Population Reference group and Jobseekers is attributable to differences in endowments. Hence, one way to improve the occupational status of Jobseekers would be through education, such as encouraging Jobseekers to complete high school. In addition, given the importance of general labour market and firm-specific skills, formal education should be combined with on-the-job training.

The second implication is that attempts to reduce job churning in the Australian labour market should recognise that the relative pecuniary measure of job quality has a stronger impact on job tenure than the absolute pecuniary measure of job quality. Hence, simply placing a Jobseeker in a high paying job will not ensure that the Jobseeker will continue working in the same job in any given period. Instead Jobseekers should be placed in jobs where the rewards best reflect their skills and knowledge of the labour market.

Furthermore, it appears that relative pecuniary benefits outweigh non-pecuniary benefits in terms of the decision-making process involved when changing jobs. Therefore, to encourage Jobseekers to continue working in the same job over time and so reduce the process of job churning, it should be recognised that Jobseekers will be more responsive to relative pecuniary rewards than to the non-pecuniary rewards of the job.

Finally, longitudinal data allow the process of job turnover in the labour market to be observed. For example, the SEUP data on the number of jobs and the duration of each job over a three-year period can be combined with individual and job-related characteristics to examine the severity of job turnover and identify the causes of job turnover. This provides valuable knowledge to further understanding of the reasons for chronic unemployment.

Overall, the job churning process is an important problem in the Australian labour market as it can lead to substantial unemployment for the same group of people. As the unemployment of these people comprises a number of spells interrupted by, generally short, periods of work, they will not feature among the long-term unemployed. However, the problems they face should not be neglected. Nor should the fact that one of these problems is their inability to stay in a job for a lengthy period of time be ignored. This study has examined a number of factors contributing to this phenomenon. Of particular importance is the impact of the quality of the job in reducing job turnover. In this regard, an understanding of the quality of the job can be used to help alleviate the job churning problems for Jobseekers in the Australian labour market.

## APPENDIX A

### DEFINITIONS AND MEANS OF VARIABLES

**First job**—This is the job obtained by Jobseekers that started on or before 3 September 1995. It includes jobs held by individuals before they were identified as Jobseekers as well as jobs held after they were identified as Jobseekers (i.e. after the May 1995 recruitment). If a Jobseeker has had more than one job then the first job is selected.

**Last job**—This is the job obtained by workers from the Population Reference group that started on or before 1 June 1995. If a person has had more than one job in the reference period then the last job is selected.

**Occupational Status**—This is the occupational status of the episode of work identified under 'First job' and 'Last job' in the reference period. Occupational status is based on ASCO version two codes. In some presentations, membership into a particular occupation is ranked in descending order as follows:

Managers and administrators

Professionals

Associate professionals

Tradespersons and related workers

Advanced clerical and service workers

Intermediate clerical, sales and service workers

Intermediate production and transport workers

Elementary clerical, sales and service workers

Labourers and related workers

**ANU3 scale**—This is a continuous variable with values 0–100. It is based on the ASCO version two codes. This variable measures the general 'goodness' of a job. The higher the ANU3 score the higher the occupational prestige. The method of constructing values of the scale for the ASCO version two codes is outlined in the text.

**Job tenure**—This is a continuous variable that measures the number of weeks the individual has been working in the current job. For Jobseekers, this is defined as the number of weeks the individual has been working in the current job (first job) until 31 August 1997 (i.e. end of wave three). If the job finished after 31 August 1997 then job tenure is computed up to this date. If the job finished before this date then the actual completion date is used in the compilation of the job tenure information. For workers from the Population Reference group, job tenure is defined as the number of weeks the individual has been working in the current job (last job) up to 31 August 1997. If the job finished before this date the actual completion date is used in the computation of job tenure. The dependent variable used in this study is the natural logarithm of job tenure.

Completed working episode/spell—This is a dichotomous variable and is set equal to unity if the individual had left the job before 31 August 1997 (i.e. end of wave three). Individuals who do not meet this criterion are assigned a value of zero.

Successful job match, six months or more—This is a dichotomous variable and is set equal to unity if the individual is working in a job that lasted six months or more. Individuals not meeting this criterion are assigned a value of zero.

Successful job match, 12 months or more—This is a dichotomous variable and is set equal to unity if the individual is working in a job that lasted 12 months or more. Individuals not meeting this criterion are assigned a value of zero.

Hourly wage—This is a continuous variable and is computed from the usual weekly earnings of each job and the usual weekly hours worked in each job. For the usual weekly earnings of each job the mid-point of each band was used to construct a continuous measure of income. The open-ended upper limit was given a value 1.5 times the lower threshold level. Hourly earnings were derived by dividing the usual weekly earnings of each job by the usual weekly hours worked in each job. The dependent variable used in this study is the natural logarithm of hourly earnings.

Bachelor degree or higher—This is a dichotomous variable and is set equal to unity if the individual possesses a higher degree, post-graduate diploma, or a bachelor degree. For individuals who do not hold these qualifications the variable is set equal to zero.

Undergraduate or associate diploma—This is a dichotomous variable and is set equal to unity if the individual possesses an undergraduate diploma or an associate diploma. For individuals who do not hold these qualifications the variable is set equal to zero.

Skilled vocational qualification—This is a dichotomous variable and is set equal to unity if the individual possesses a skilled vocational qualification. For individuals who do not hold these qualifications the variable is set equal to zero.

Basic vocational qualification—This is a dichotomous variable and is set equal to unity if the individual possesses a basic vocational qualification. For individuals who do not hold these qualifications the variable is set equal to zero.

Attended highest level of secondary school—This is a dichotomous variable and is set equal to unity if the individual has attended the highest level of secondary school and does not possess a post-secondary qualification. For individuals not meeting these criteria the variable is set equal to zero.

Left school at 16 years and over—This is a dichotomous variable and is set equal to unity if the individual left school at 16, 17 or 18 years of age and does not possess a post-secondary qualification. For individuals not meeting these criteria the variable is set equal to zero.

Left school aged 15 years and under—This is a dichotomous variable and is set equal to unity if the individual left school at 15 years of age or younger, or never attended school, and does not possess a post-secondary qualification. For individuals not meeting these criteria the variable is set equal to zero.

Never worked—This is a dichotomous variable and is set equal to zero if the individual has worked part time, full time or both prior to September 5th 1994. For individuals not meeting these criteria the variable is set equal to one.

Looking for work since first left full-time education—This is a continuous variable that measures the number of years the individual looked for work while not working since he/she left full-time education.

Duration of current job—This is a continuous variable that measures the number of years the individual has been employed in the current job. For Jobseekers, this is defined as the number of years the individual had been employed in the current job (first job) until 1 October 1995 (i.e. the second phase of interview for wave one). If the job finished after 1 October 1995 then the duration of the current job is computed up to this date. If the job finished before this date then the actual completion date is used in the computation of the duration of the current job. For workers from the Population Reference group, the duration of the current job is defined as the number of years the individual has been employed in the current job (last job) up to 1 June 1995 (i.e. the recruitment interview).

Labour market experience—This is a continuous variable that measures the number of years in paid work since the individual first left full-time education. If the number of years in paid work is less than one year, the labour market experience variable is assigned a value of one-half year.

Public sector—This is a dichotomous variable and is set equal to unity if the individual is employed in a public sector. Individuals not meeting this criterion are assigned a value of zero.

Size of location, 1–10 employees—This is a dichotomous variable and is set equal to unity if the individual is employed in a firm that has between 1 and 10 employees working at a particular address. Individuals not meeting this criterion are assigned a value of zero.

Size of location, 11–50 employees—This is a dichotomous variable and is set equal to unity if the individual is employed in a firm that has between 11 and 50 employees working at a particular address. Individuals not meeting this criterion are assigned a value of zero.

Size of location, 51–100 employees—This is a dichotomous variable and is set equal to unity if the individual is employed in a firm that has between 51 and 100 employees working at a particular address. Individuals not meeting this criterion are assigned a value of zero.

Size of location, 100 employees or more—This is a dichotomous variable and is set equal to unity if the individual is employed in a firm that has 100 employees or more working at a particular address. Individuals not meeting this criterion are assigned a value of zero.

Speaks English very well/well—This is a dichotomous variable and is set equal to unity if the individual speaks a language other than English at home and speaks English very well or well. Individuals not meeting these criteria are assigned a value of zero.

Speaks English fairly well/not well/not at all—This is a dichotomous variable and is set equal to unity if the individual speaks a language other than English at home and speaks English fairly well, not well, or does not speak English at all. Individuals not meeting these criteria are assigned a value of zero.

Married—This is a dichotomous variable and is set equal to unity if the individual is married or living in a de facto relationship. Individuals not meeting these criteria are assigned a value of zero.

Separated, divorced, widowed—This is a dichotomous variable and is set equal to unity if the individual is separated, divorced or widowed. Individuals not meeting these criteria are assigned a value of zero.

Never married—This is a dichotomous variable and is set equal to unity if the individual has never married. Individuals not meeting this criterion are assigned a value of zero.

Born in main English-speaking country—This is a dichotomous variable and is set equal to unity if the individual was born outside Australia in a main English-speaking country. Individuals not meeting this criterion are assigned a value of zero.

Born in other country—This is a dichotomous variable and is set equal to unity if the individual was born outside Australia in other than a main English-speaking country. Individuals not meeting this criterion are assigned a value of zero.

Born in Australia—This is a dichotomous variable and is set equal to unity if the individual was born in Australia. Individuals who were born outside Australia are assigned a value of zero.

Indigenous origin—This is a dichotomous variable and is set equal to unity if the individual is of Aboriginal or Torres Strait Islander origin. Non-Indigenous people are assigned a value of zero.

Disability—This is a dichotomous variable and is set equal to unity if the individual has a disability. The variable is set equal to zero for individuals without a disability.

Period of residence—This is a continuous variable that measures the years foreign-born individuals have resided in Australia. It is computed from the year of arrival in Australia, and for the first wave it is set equal to 1995.5 minus the year of arrival.

Capital city—This is a dichotomous variable and is set equal to unity if the individual resides in a capital city. Individuals residing in other regions are assigned a value of zero for this variable.

Major urban—This is a dichotomous variable and is set equal to unity if the individual resides in a major urban area. Individuals residing in other regions are assigned a value of zero for this variable.

Other urban—This is a dichotomous variable and is set equal to unity if the individual resides in other urban areas. Individuals residing in other regions are assigned a value of zero for this variable.

Rural—This is a dichotomous variable and is set equal to unity if the individual resides in a rural area. Individuals residing in other regions are assigned a value of zero for this variable.

Socioeconomic index for area of residence—This is a continuous variable and measures the relative socioeconomic disadvantage in the region of residence in Australia. It is measured in deciles and so ranges from one to ten.

Absolute measure of job quality–ANU3 score—See definition of ANU3.

Poor job (relative measure of job quality–occupational status (ordinary least squares estimates))—This is a dichotomous variable and is set equal to unity if the individual is working in a job with an occupational status score of five points or more below the predicted occupational status score that the individual would have obtained if he/she was treated in the labour market in exactly the same way as the benchmark group of workers from the Population Reference group. Individuals not meeting this criterion are assigned a value of zero.

Poor job (relative measure of job quality–occupational status (ordered probit estimates))—This is a dichotomous variable and is set equal to unity if the individual is working in a job with the scale of the general 'goodness' of the job assigned to the actual occupation being less, by a set amount, than the scale of the general 'goodness' of the job assigned to the predicted occupation. Individuals not meeting this criterion are assigned a value of zero.

Absolute measure of job quality–hourly wage—See definition of hourly wage.

Poor job (relative measure of job quality–earnings)—This is a dichotomous variable and is set equal to unity if the individual receives an hourly wage from the job that is below the predicted hourly wage that the individual would have obtained if he/she was treated in the labour market in exactly the same way as the benchmark group of workers from the Population Reference group. Individuals not meeting this criterion are assigned a value of zero.

## A1 MEANS AND STANDARD DEVIATIONS OF VARIABLES, POPULATION REFERENCE AND JOBSEEKER GROUPS

Variable	Population Reference group		Jobseeker group	
	Mean	Std. Dev	Mean	Std. Dev
<i>Educational attainment</i>				
Bachelor degree or higher	16.6	37.3	9.0	28.7
Undergraduate or associate diploma	10.3	30.4	6.2	24.1
Skilled vocational qualification	21.7	41.3	15.8	36.5
Basic vocational qualification	5.5	22.8	6.5	24.6
Attended highest level of secondary school	16.1	36.7	19.3	39.4
Left school aged 16 years and over	15.2	35.9	23.3	42.3
Left school aged 15 years and under	14.5	35.2	19.9	39.9
<i>General labour market experience</i>				
Experience (years)	17.5	11.3	10.5	10.5
Duration of current job (years)	6.6	7.6	1.6	3.5
<i>English proficiency</i>				
Speaks English very well/well	14.3	35.1	11.2	31.5
Speaks English fairly well/not well/not at all	2.6	15.9	4.6	21.0
<i>Marital status</i>				
Separated/divorced/widowed	7.3	26.0	9.5	29.3
Never married	27.8	44.8	49.5	50.0
Married	65.0	47.7	41.0	49.2
Female	42.5	49.4	41.8	49.3
Disability	20.0	40.0	27.6	44.7
<i>Birthplace</i>				
Born in main English-speaking country	10.3	30.4	9.7	29.6
Born in other country	14.2	34.9	13.8	34.5
Indigenous origin	0.7	8.1	2.9	16.7
Period of residence (years)	5.3	11.1	4.1	9.4
<i>Labour market history</i>				
Never worked	1.8	13.5	8.8	28.3
Looking for work since first left full-time education (years)	0.4	1.0	1.9	2.4
<i>Area of residence</i>				
Major urban	6.4	24.5	5.6	23.0
Other urban	17.6	38.1	27.1	44.4
Rural	15.9	36.6	15.1	35.8
Capital city	60.1	49.0	52.2	50.0
Socioeconomic index for area of residence	6.0	2.9	5.2	2.8
Public sector	20.1	40.1	11.5	31.9
Size of location 1–10 employees	41.7	49.3	47.4	49.9
Size of location 11–50 employees	22.5	41.8	26.9	44.5
Size of location 51–100 employees	10.5	30.7	8.1	27.3
Size of location 100 employee or more	25.3	43.5	17.6	38.1
Sample size	1 533	..	3 027	..
Weighted estimates ('000)	7 417.5	..	486.0	..

The table A1 data show that the productivity-related characteristics, labour market history, area of residence and sector of employment of Jobseekers and the Population Reference group differ. With regard to productivity-related characteristics, Jobseekers possess, on average, a lower level of education and fewer years of labour market experience than the members of the Population Reference group. For example, the percentage of the Population Reference group who possess a bachelor degree or higher is almost double that of Jobseekers. The respective percentage figures are 17% and 9%. Other major differences in educational attainment between these two groups occur in relation to skilled vocational qualification, with 16% of the Jobseekers and 22% of the Population Reference group possessing this qualification. Moreover, there is a higher percentage of Jobseekers who have a low level of education. For example, 23% of Jobseekers left school at 16 years of age or older and a further 20% left school at age 15 years or younger. The comparable figures for the Population Reference group are 15% in each of the educational categories.

In addition to a relatively low educational attainment, another factor which may contribute to the Jobseekers' poor performance in the labour market is their lack of general and specific on-the-job skills. For example, Jobseekers have spent, on average, seven years less in the labour market than the Population Reference group. Moreover, the average (interrupted) duration of the current job for the Jobseekers is two years compared to seven years for the Population Reference group.

Another sizeable difference between the Jobseeker and Population Reference groups is marital status. One-half of the Jobseekers had never married compared to 28% among the Population Reference group.<sup>1</sup> In contrast, there is a higher percentage of the Population Reference group who are married (65%) than is the case among Jobseekers (41%).

The labour market history variables reveal quite considerable differences between Jobseekers and members of the Population Reference group. For example, there is a higher percentage of Jobseekers (9%) who did not work prior to obtaining their current job compared to the Population Reference group (2%). Furthermore, Jobseekers have spent, on average, 1.5 years more looking for work since they left full-time education than the members of the Population Reference group.

With regard to the characteristics of the place of employment, several differences occur between Jobseekers and the Population Reference group. First, the Population Reference group has a higher representation of workers employed in the public sector compared to the Jobseekers. The comparable percentage figures are 20% and 12%, respectively.

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<sup>1</sup> The average age of the Jobseeker and Population Reference groups is 31 years and 37 years, respectively.



Second, there is a higher percentage of Jobseekers who are employed in small firms (1–10 employees), and a lower percentage of Jobseekers who are employed in very large firms (100 employees or more) than is the case for the Population Reference group.

**APPENDIX B**

**MODELS OF OCCUPATIONAL STATUS FOR MALES AND FEMALES**

**B1** ANALYSES OF OCCUPATIONAL STATUS FOR MALES AND FEMALES, POPULATION REFERENCE GROUP, 1995

Variable	Males		Females	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	13.263	3.95	15.823	5.14
<i>Educational attainment</i>				
Bachelor degree or higher	34.891	14.18	25.066	11.92
Undergraduate or associate diploma	13.077	5.22	15.387	6.82
Skilled vocational qualification	4.806	2.55	3.895	1.83
Basic vocational qualification	7.728	2.07	1.729	0.76
Attended highest level of secondary school	10.213	4.44	6.101	3.04
Left school aged 16 years and over	3.177	1.37	2.107	1.09
<i>General labour market experience</i>				
Experience (years)	0.725	3.35	0.358	1.67
Experience <sup>2</sup> /100	-1.532	-3.30	-0.838	-1.52
Duration of current job (years)	0.182	0.92	0.853	3.34
Duration of current job <sup>2</sup> /100	0.200	0.33	-2.199	-2.06
<i>English proficiency</i>				
Speaks English very well/well	-0.431	-0.17	-3.461	-1.37
Speaks English fairly well/not well/not at all	-3.101	-0.67	-8.397	-1.70
<i>Marital status</i>				
Separated/divorced/widowed	-4.004	-1.19	-2.676	-1.41
Never married	-1.985	-1.23	-2.552	-1.66
Disability	2.012	1.46	0.401	0.28
<i>Birthplace</i>				
Born in main English-speaking country	5.080	1.46	-2.202	-0.72
Born in other country	-0.544	-0.15	-6.732	-1.81
Indigenous origin	-3.644	-0.68	8.832	1.17
Period of residence (years)	0.031	0.27	0.152	1.47
<i>Labour market history</i>				
Never worked	-3.800	-1.08	-0.976	-0.26
Looking for work since first left full-time education (years)	-2.354	-4.07	-1.001	-2.00
<i>Area of residence</i>				
Major urban	5.527	2.65	-2.953	-1.29
Other urban	-3.910	-2.59	1.186	0.73
Rural	-0.033	-0.02	-2.120	-1.25
Socioeconomic index for area of residence	-0.048	-0.21	0.505	2.50
Public sector	6.968	4.20	7.486	5.24
Size of location 1-10 employees	2.904	1.70	3.468	2.35
Size of location 11-50 employees	-2.020	-1.09	0.480	0.30
Size of location 51-100 employees	-2.235	-1.05	0.877	0.40
F (29, 799)	19.71	..	..	..
F (29, 704)	..	..	14.09	..
Adjusted R <sup>2</sup>	0.40	..	0.35	..
Sample size	829	..	704	..
Weighted estimates ('000)	4,266.6	..	3,150.8	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980).

Variable	Males		Females	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	12.113	7.21	16.533	8.72
<i>Educational attainment</i>				
Bachelor degree or higher	22.145	11.77	20.241	13.09
Undergraduate or associate diploma	10.462	5.61	9.663	6.20
Skilled vocational qualification	4.681	4.86	4.421	3.21
Basic vocational qualification	5.834	2.70	2.902	2.09
Attended highest level of secondary school	4.893	4.71	2.810	2.34
Left school aged 16 years and over	1.963	2.26	1.630	1.40
<i>General labour market experience</i>				
Experience (years)	0.492	4.36	0.309	2.13
Experience <sup>2</sup> /100	-1.110	-3.90	-0.858	-1.90
Duration of current job (years)	0.415	1.86	0.752	2.39
Duration of current job <sup>2</sup> /100	-0.424	-0.42	-2.466	-1.16
<i>English proficiency</i>				
Speaks English very well/well	0.924	0.49	-2.344	-1.32
Speaks English fairly well/not well/not at all	-4.636	-1.74	-6.458	-2.32
<i>Marital status</i>				
Separated/divorced/widowed	-1.863	-1.28	0.906	0.79
Never married	-2.122	-2.46	-1.327	-1.42
Disability	-0.068	-0.09	0.329	0.39
<i>Birthplace</i>				
Born in main English-speaking country	1.104	0.58	-0.688	-0.37
Born in other country	-0.628	-0.24	-0.018	-0.01
Indigenous origin	0.135	0.07	1.460	0.66
Period of residence (years)	0.020	0.29	0.057	0.79
<i>Labour market history</i>				
Never worked	-0.899	-0.82	-1.162	-0.86
Looking for work since first left full-time education (years)	-0.368	-3.22	-0.362	-1.89
<i>Area of residence</i>				
Major urban	2.448	1.43	-1.378	-0.88
Other urban	-0.573	-0.72	-0.846	-0.92
Rural	-0.209	-0.22	-1.090	-0.95
Socioeconomic index for area of residence	0.451	3.54	0.134	0.98
Public sector	4.842	3.56	9.105	8.05
Size of location 1-10 employees	0.801	0.78	2.536	2.41
Size of location 11-50 employees	-1.676	-1.51	1.393	1.25
Size of location 51-100 employees	-3.314	-2.32	-2.692	-1.71
F (29, 1 699)	19.51	..	..	..
F (29, 1 268)	..	..	15.58	..
Adjusted R <sup>2</sup>	0.24	..	0.25	..
Sample size	1 729	..	1 298	..
Weighted estimates ('000)	282.7	..	203.3	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980).

**APPENDIX C**

**RESULTS FROM MODELS OF JOB TENURE**

**C1** LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS WITH JOBS THAT LASTED SIX MONTHS OR MORE, EXCLUDING JOB QUALITY

<i>Variables</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	0.198	0.96
<i>Educational attainment</i>		
Bachelor degree or higher	0.358	2.17
Undergraduate or associate diploma	0.106	0.59
Skilled vocational qualification	0.412	3.08
Basic vocational qualification	0.304	1.72
Attended highest level of secondary school	0.145	1.14
Left school aged 16 years and over	0.086	0.72
<i>General labour market experience</i>		
Experience (years)	0.051	3.86
Experience <sup>2</sup> /100	-0.074	-2.13
<i>English proficiency</i>		
Speaks English very well/well	-0.518	-2.79
Speaks English fairly well/not well/not at all	-0.249	-0.89
<i>Marital status</i>		
Separated/divorced/widowed	-0.119	-0.85
Never married	-0.136	-0.14
Female	0.163	1.97
Disability	-0.235	-2.63
<i>Birthplace</i>		
Born in main English-speaking country	-0.105	-0.53
Born in other country	0.353	1.44
Indigenous origin	0.240	1.01
Period of residence (years)	-0.006	-0.78
<i>Labour market history</i>		
Never worked	-1.223	-7.80
Looking for work since first left full-time education (years)	-0.147	-7.59
<i>Area of residence</i>		
Major urban	-0.055	-0.32
Other urban	-0.115	-1.18
Rural	-0.104	-0.89
Socioeconomic index for area of residence	0.009	0.61
Public sector	0.041	0.32
Size of location 1–10 employees	-0.070	-0.63
Size of location 11–50 employees	-0.134	-1.12
Size of location 51–100 employees	-0.173	-1.06
$\chi^2$ (28)	284.79	..
McFadden R <sup>2</sup> (a)	0.07	..
Sample size	3 027	..
Weighted estimates ('000)	486.0	..

(a) The McFadden R<sup>2</sup> is calculated as  $1 - (I_m / I_o)$ , where  $I_m$  = the maximised log-likelihood value of the model and  $I_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996).

Variable	(a)		(b)	
	Coefficient	t-ratio	Coefficient	t-ratio
Intercept	-0.703	-3.20	-0.770	-3.52
<i>Educational attainment</i>				
Bachelor degree or higher	0.416	2.48	0.435	2.58
Undergraduate or associate diploma	0.133	0.72	0.142	0.77
Skilled vocational qualification	0.324	2.38	0.349	2.57
Basic vocational qualification	0.191	1.04	0.207	1.13
Attended highest level of secondary school	0.365	2.67	0.357	2.61
Left school aged 16 years and over	0.184	1.41	0.191	1.47
<i>General labour market experience</i>				
Experience (years)	0.066	4.96	0.067	5.04
Experience <sup>2</sup> /100	-0.074	-2.12	-0.077	-2.23
<i>English proficiency</i>				
Speaks English very well/well	-0.453	-2.31	-0.453	-2.31
Speaks English fairly well/not well/not at all	-0.296	-1.03	-0.340	-1.19
<i>Marital status</i>				
Separated/divorced/widowed	-0.155	-1.09	-0.137	-0.96
Never married	-0.056	-0.53	-0.058	-0.55
Female	0.175	2.03	0.179	1.95
Disability	-0.026	-0.28	-0.028	-0.30
<i>Birthplace</i>				
Born in main English-speaking country	-0.229	-1.13	-0.220	-1.09
Born in other country	0.370	1.47	0.386	1.53
Indigenous origin	-0.252	-0.93	-0.203	-0.75
Period of residence (years)	-0.003	-0.48	-0.004	-0.53
<i>Labour market history</i>				
Never worked	-1.148	-5.82	-1.121	-5.69
Looking for work since first left full-time education (years)	-0.180	-7.70	-0.173	-7.47
<i>Area of residence</i>				
Major urban	-0.095	-0.53	-0.086	-0.48
Other urban	-0.184	-1.80	-0.199	-1.94
Rural	-0.114	-0.94	-0.139	-1.15
Socioeconomic index for area of residence	0.007	0.45	0.007	0.49
Public sector	-0.046	-0.35	-0.016	-0.12
Size of location 1–10 employees	0.016	0.14	0.007	0.06
Size of location 11–50 employees	-0.171	-1.39	-0.169	-1.37
Size of location 51–100 employees	-0.198	-1.17	-0.179	-1.06
<i>Job quality</i>				
Poor job	-0.259	-3.08	-0.131	-1.57
$\chi^2$ (29)	324.91	..	317.84	..
McFadden R <sup>2</sup> (c)	0.08	..	0.08	..
Sample size	3 027	..	3 027	..
Weighted estimates ('000)	486.0	..	486.0	..

(a) The job quality variable in these columns of results is obtained from a comparison of the actual occupational outcome with that predicted on the basis of the ordered probit model of occupational outcomes.

(b) The job quality variable in these columns of results is obtained from a comparison of the actual occupational status score with that predicted from the models of occupational status estimated in section 4.

(c) The McFadden R<sup>2</sup> is calculated as  $1 - (I_m / I_o)$ , where  $I_m$  = the maximised log-likelihood value of the model and  $I_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996).

### C3

#### ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS, EXCLUDING JOB QUALITY

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	3.635	24.67
<i>Educational attainment</i>		
Bachelor degree or higher	0.254	2.32
Undergraduate or associate diploma	0.097	0.85
Skilled vocational qualification	0.291	3.35
Basic vocational qualification	0.105	0.83
Attended highest level of secondary school	0.258	2.97
Left school aged 16 years and over	0.125	1.53
<i>General labour market experience</i>		
Experience (years)	0.074	8.55
Experience <sup>2</sup> /100	-0.059	-2.76
<i>English proficiency</i>		
Speaks English very well/well	-0.122	-1.01
Speaks English fairly well/not well/not at all	-0.132	-0.68
<i>Marital status</i>		
Separated/divorced/widowed	-0.184	-1.99
Never married	0.026	0.40
Female	0.170	2.95
Disability	-0.112	-1.93
<i>Birthplace</i>		
Born in main English-speaking country	-0.016	-0.11
Born in other country	0.141	0.81
Indigenous origin	-0.123	-0.75
Period of residence (years)	-0.006	-1.23
<i>Labour market history</i>		
Never worked	-0.735	-7.56
Looking for work since first left full-time education (years)	-0.076	-8.77
<i>Area of residence</i>		
Major urban	0.014	0.11
Other urban	-0.097	-1.50
Rural	0.048	0.64
Socioeconomic index for area of residence	0.013	1.40
Public sector	0.139	1.56
Size of location 1-10 employees	-0.162	-2.12
Size of location 11-50 employees	-0.213	-2.61
Size of location 51-100 employees	-0.182	-1.59
<i>Sample size</i>	3 027	..
<i>Weighted estimates ('000)</i>	486.0	..

## APPENDIX D

## RESULTS FROM EARNINGS MODELS

### D1

ORDINARY LEAST SQUARES RESULTS OF EARNINGS FOR MALES AND FEMALES, POPULATION  
REFERENCE GROUP, 1995

Variable	Males		Females	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	2.264	15.50	2.095	22.50
<i>Educational attainment</i>				
Bachelor degree or higher	0.426	4.09	0.539	8.28
Undergraduate or associate diploma	0.241	2.63	0.451	5.36
Skilled vocational qualification	0.100	1.10	0.150	2.10
Basic vocational qualification	0.117	1.11	0.220	2.56
Attended highest level of secondary school	0.110	1.26	0.322	4.34
Left school aged 16 years and over	0.002	0.02	0.220	3.41
<i>General labour market experience</i>				
Experience (years)	0.054	5.78	0.029	4.28
Experience <sup>2</sup> /100	-0.111	-5.41	-0.052	-2.94
Duration of current job (years)	-0.010	-1.00	0.008	0.85
Duration of current job <sup>2</sup> /100	0.039	1.34	-0.049	-1.18
<i>English proficiency</i>				
Speaks English very well/well	-0.097	-1.03	-0.00008	-0.001
Speaks English fairly well/not well/not at all	-0.050	-0.30	-0.176	-1.14
<i>Marital status</i>				
Separated/divorced/widowed	-0.177	-1.84	-0.103	-1.83
Never married	-0.027	-0.41	-0.106	-2.35
Disability	-0.014	-0.23	-0.037	-0.72
<i>Birthplace</i>				
Born in main English-speaking country	0.080	0.85	-0.057	-0.82
Born in other country	-0.101	-0.91	-0.097	-0.72
Indigenous origin	-0.055	-0.57	-0.019	-0.11
Period of residence (years)	0.006	1.48	0.0002	0.07
<i>Labour market history</i>				
Never worked	-0.080	-0.59	-0.139	-1.67
Looking for work since first left full-time education (years)	-0.026	-1.39	-0.001	-0.05
<i>Area of residence</i>				
Major urban	-0.072	-0.91	-0.054	-0.69
Other urban	-0.060	-0.82	-0.044	-0.78
Rural	-0.127	-1.87	-0.204	-4.26
Socioeconomic index for area of residence	0.007	0.88	0.007	1.05
Public sector	0.010	0.21	0.020	0.52
Size of location 1–10 employees	-0.577	-8.01	-0.145	-2.98
Size of location 11–50 employees	-0.260	-4.62	-0.012	-0.25
Size of location 51–100 employees	-0.234	-3.78	-0.036	-0.72
F (29, 645)	8.71	..	..	..
F (29, 589)	..	..	6.32	..
Adjusted R <sup>2</sup>	0.25	..	0.20	..
Sample size	675	..	619	..
Weighted estimates ('000)	3, 463.7	..	2, 759.9	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980).

Variable	Males		Females	
	Coefficient	t-ratio(a)	Coefficient	t-ratio(a)
Intercept	2.062	29.07	2.025	24.58
<i>Educational attainment</i>				
Bachelor degree or higher	0.248	3.45	0.331	4.35
Undergraduate or associate diploma	0.177	2.33	0.220	3.59
Skilled vocational qualification	0.179	4.09	0.188	3.18
Basic vocational qualification	0.009	0.12	0.082	1.51
Attended highest level of secondary school	0.138	3.00	0.088	1.67
Left school aged 16 years and over	0.009	0.22	0.024	0.53
<i>General labour market experience</i>				
Experience (years)	0.034	7.39	0.029	4.75
Experience <sup>2</sup> /100	-0.062	-5.79	-0.067	-3.89
Duration of current job (years)	0.035	3.54	0.019	1.14
Duration of current job <sup>2</sup> /100	-0.087	-2.49	-0.057	-0.47
<i>English proficiency</i>				
Speaks English very well/well	0.027	0.51	0.022	0.22
Speaks English fairly well/not well/not at all	-0.176	-1.80	-0.096	-0.60
<i>Marital status</i>				
Separated/divorced/widowed	-0.095	-1.53	0.010	0.21
Never married	-0.004	-0.11	-0.095	-2.31
Disability	-0.032	-1.01	-0.045	-1.26
<i>Birthplace</i>				
Born in main English-speaking country	-0.050	-0.57	0.043	0.54
Born in other country	-0.153	-1.78	-0.073	-0.54
Indigenous origin	-0.038	-0.70	0.286	1.91
Period of residence (years)	0.003	0.92	-0.0004	-0.12
<i>Labour market history</i>				
Never worked	-0.200	-3.68	-0.123	-2.09
Looking for work since first left full-time education (years)	0.015	2.50	-0.0007	-0.08
<i>Area of residence</i>				
Major urban	-0.015	-0.24	-0.029	-0.50
Other urban	-0.034	-1.05	0.044	1.18
Rural	-0.061	-1.51	-0.051	-1.07
Socioeconomic index for area of residence	-0.003	-0.48	0.007	1.20
Public sector	0.023	0.57	0.142	3.11
Size of location 1-10 employees	-0.217	-5.69	-0.116	-2.70
Size of location 11-50 employees	-0.044	-1.12	-0.081	-1.75
Size of location 51-100 employees	-0.075	-1.48	0.019	0.37
<i>F</i> (29, 1 509)	13.81	..	..	..
<i>F</i> (29, 1 156)	..	..	7.66	..
Adjusted <i>R</i> <sup>2</sup>	0.19	..	0.14	..
Sample size	1 539	..	1 186	..
Weighted estimates ('000)	253.2	..	187.7	..

(a) The t-ratios are formed using heteroscedasticity-consistent standard errors (see White 1980).



## APPENDIX E

## MODELS OF JOB TENURE

### E1 LOGISTIC ANALYSIS OF THE PROBABILITY OF JOBSEEKERS WITH JOBS THAT LASTED SIX MONTHS OR MORE, EXCLUDING JOB QUALITY

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio</i>
Intercept	0.130	0.60
<i>Educational attainment</i>		
Bachelor degree or higher	0.377	2.18
Undergraduate or associate diploma	0.148	0.78
Skilled vocational qualification	0.418	2.96
Basic vocational qualification	0.361	1.95
Attended highest level of secondary school	0.208	1.55
Left school aged 16 years and over	0.096	0.76
<i>General labour market experience</i>		
Experience (years)	0.042	3.06
Experience <sup>2</sup> /100	-0.061	-1.63
<i>English proficiency</i>		
Speaks English very well/well	-0.488	-2.50
Speaks English fairly well/not well/not at all	-0.223	-0.75
<i>Marital status</i>		
Separated/divorced/widowed	-0.018	-0.12
Never married	0.067	0.63
Female	0.196	2.26
Disability	-0.217	-2.31
<i>Birthplace</i>		
Born in main English-speaking country	-0.015	-0.07
Born in other country	0.331	1.29
Indigenous origin	0.315	1.29
Period of residence (years)	-0.007	-0.87
<i>Labour market history</i>		
Never worked	-1.268	-7.80
Looking for work since first left full-time education (years)	-0.150	-7.18
<i>Area of residence</i>		
Major urban	-0.047	-0.27
Other urban	-0.057	-0.56
Rural	-0.103	-0.84
Socioeconomic index for area of residence	0.010	0.64
Public sector	0.082	0.64
Size of location 1–10 employees	-0.230	-2.00
Size of location 11–50 employees	-0.138	-1.15
Size of location 51–100 employees	-0.165	-1.01
$\chi^2$ (28)	251.71	..
McFadden $R^2$ (a)	0.07	..
Sample size	2 725	..
Weighted estimates ('000)	441.0	..

(a) The McFadden  $R^2$  is calculated as  $1 - (I_m / I_o)$ , where  $I_m$  = the maximised log-likelihood value of the model and  $I_o$  = the log-likelihood value if the non-intercept coefficients are restricted to zero (see Veall & Zimmermann 1996). The total figure differs from table C1 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

**E2**

## ESTIMATES OF THE WEIBULL MODEL OF JOB TENURE FOR JOBSEEKERS, EXCLUDING JOB QUALITY

<i>Variable</i>	<i>Coefficient</i>	<i>t-ratio(a)</i>
Intercept	3.584	23.49
<i>Educational attainment</i>		
Bachelor degree or higher	0.299	2.65
Undergraduate or associate diploma	0.219	1.85
Skilled vocational qualification	0.351	3.89
Basic vocational qualification	0.162	1.25
Attended highest level of secondary school	0.282	3.13
Left school aged 16 years and over	0.162	1.90
<i>General labour market experience</i>		
Experience (years)	0.068	7.51
Experience <sup>2</sup> /100	-0.049	-2.19
<i>English proficiency</i>		
Speaks English very well/well	-0.117	-0.98
Speaks English fairly well/not well/not at all	-0.167	-0.85
<i>Marital status</i>		
Separated/divorced/widowed	-0.041	-0.44
Never married	0.096	1.38
Female	0.195	3.31
Disability	-0.057	-0.92
<i>Birthplace</i>		
Born in main English-speaking country	0.059	0.39
Born in other country	0.129	0.74
Indigenous origin	-0.044	-0.26
Period of residence (years)	-0.008	-1.54
<i>Labour market history</i>		
Never worked	-0.733	-7.53
Looking for work since first left full-time education (years)	-0.088	-9.64
<i>Area of residence</i>		
Major urban	0.071	0.55
Other urban	-0.078	-1.17
Rural	-0.012	-0.16
Socioeconomic index for area of residence	0.014	1.48
Public sector	0.187	2.14
Size of location 1-10 employees	-0.343	-4.48
Size of location 11-50 employees	-0.211	-2.66
Size of location 51-100 employees	-0.192	-1.72
<i>Sample size</i>	2 725	..
<i>Weighted estimates ('000)</i>	441.0	..

(a) The total figure differs from table C3 due to the exclusion of observations in 'not applicable' and 'payment in kind' categories.

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