

RESERVATION WAGES AND THE DURATION OF UNEMPLOYMENT

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Abstract

This paper investigates those factors which affect the duration of unemployment of Australian job seekers. The analysis uses data on individual job seekers from the Survey of Employment and Unemployment Patterns (SEUP) to assess the influence of a comprehensive array of personal and background characteristics on the duration of unemployment. The data set also provides job seekers' responses concerning their minimum acceptable (or reservation) wage.

The results suggest that around one-fifth of adult unemployed job seekers would be willing to work for a wage less than the legal minimum. It is also found that a job seekers' reservation wage has little effect on his/her unemployment duration. Instead, the binding constraint for job seekers appears to be that they receive very few job offers. Although legal minimum wages could be part of the story, more research is required to properly understand their role in the dynamics of the labour market.

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1. Introduction

The average duration of unemployment in Australia has increased significantly since the 1960s. Despite its importance for understanding the rise in Australia's aggregate unemployment rate, there has been relatively little empirical investigation of its causes. To the extent that the Australian literature has addressed this issue, the focus has been on explaining the probability of leaving unemployment rather than on the factors which directly affect unemployment duration. In particular, the role of minimum wages, either as legal minima that influence firm behaviour, or as minimum acceptable wages to job seekers, has not been analysed in depth.

This paper investigates the factors affecting the duration of unemployment using data on individual Australian job seekers. These data, which come from the Survey of Employment and Unemployment Patterns (SEUP), allow us to assess the influence of a comprehensive array of personal characteristics. Importantly, the data set provides job seekers' responses concerning their minimum acceptable (or reservation) wage. The reservation wage is a central feature of basic job-search theory, and its availability allows us to specify an empirical model closely tied to theory. Although previous Australian studies have investigated unemployment duration using data on individuals, the reservation wage has only been included in these studies in an *ad hoc* manner, to the extent that it has been considered directly at all.

We find that the reservation wage does not appear to affect the duration of unemployment. The binding constraint for job seekers is more likely to be that they receive very few job offers. Descriptive evidence suggests that one reason for this may be that minimum wages are pricing some job seekers out of the market. However, more research is required to properly understand the role of minimum

wages. Non-wage aspects of employment, such as the type of occupation, also appear to have a role to play in explaining job seeker behaviour.

The rest of the paper is organised as follows: in Section 2 we briefly review current evidence regarding which factors affect unemployment duration in Australia. This also provides an opportunity to motivate the approach taken in this paper. In Section 3 we discuss the data we use and consider descriptive evidence for the role played in job-search behaviour by the reservation wage. We derive an empirical model of unemployment duration from job-search theory in Section 4, and discuss the practical issues of estimating the empirical model in Section 5. Section 6 presents and discusses the results and Section 7 concludes.

2. The Australian Evidence

As there are relatively few cross-section or longitudinal data sets available, most Australian studies of unemployment have been based on macroeconomic data. In general, studies which have used data on individuals have estimated models which explain the probability of leaving unemployment, either after a given duration of unemployment or over a fixed period of time. The probability of leaving unemployment indirectly provides information about the characteristics which are likely to affect an individual's duration of unemployment. To date, only Miller and Volker (1987) have directly investigated those factors which affect unemployment duration using individual level data.

The most frequently used empirical model for investigating unemployment at the individual level explains the probability of leaving unemployment given the duration of unemployment already experienced. This framework, also known as the hazard model, has been used by Brooks (1986) and Miller and Volker (1987) to look at the youth labour market, by Aungles and Stewart (1986) to look at the behaviour of job seekers registered with the Commonwealth Employment Service (CES) in the Brisbane metropolitan area, and by Stromback, Dockery and Ying (1998) to look at a large cross-section of Australian job seekers surveyed in the SEUP.

In general, these studies find that among the general population, older people are less likely to leave unemployment than younger people, but when the analysis is restricted to the youth labour market, unemployed youth in their early twenties are more likely to exit unemployment than unemployed teenagers. Work experience and the level of education increase the probability of leaving unemployment, as does being married. To the extent that the duration of unemployment affects the probability of exiting unemployment, the effect appears to be restricted to the very short term.

Although this framework uses job-search theory to suggest the variables which should be included in an econometric model, the estimated parameters cannot be directly related back to the theory, and in this sense this analysis is essentially ‘reduced form’. In this respect it is noteworthy that none of the studies above simultaneously estimated the probability of leaving unemployment after a given duration of unemployment and reservation wages, as might be suggested by theory. It is also likely that the results are affected by the functional forms which are assumed for the different components of the hazard model.

The second indirect approach to understanding those factors which affect unemployment duration is to model transitions between labour market states between two points in time. This method has been used by Brooks and Volker (1985), who focus on the youth labour market, and Strombach, Dockery and Ying (1998). The effects of different characteristics on the probability of moving out of unemployment are consistent with the results obtained by studies noted earlier.

Brooks and Volker (1985) investigate the probability that an individual will either stay in unemployment, exit unemployment for full-time work or exit unemployment for part-time work. The reservation wage and duration of unemployment are included as explanatory variables. Across different specifications, one or other of these variables appeared to be significant, which suggests that they are highly correlated. Brooks and Volker also estimate an equation for reservation wages as a function of unemployment duration as well as other personal and background characteristics. Strombach, Dockery and Ying (1998) estimate similar models for the probability of remaining in unemployment

or leaving unemployment for full-time or part-time work.¹ They do not consider the reservation wage and find that longer spells of unemployment significantly reduce an individual's chances of getting a job.

Miller and Volker (1987) is the only Australian study of which we are aware that estimates an equation for unemployment duration directly. They exclude the reservation wage from their analysis, citing evidence that minimum wages, not reservation wages, are the real constraint facing job seekers in the youth labour market.

As already mentioned, the estimation methods outlined above use job-search theory to suggest which variables should be included to explain unemployment duration, but it is not possible to relate the estimated parameters back to the theory. The analysis which follows extends this literature by deriving an empirical model for unemployment duration which is directly related to job-search theory. The development of the empirical model in Section 4 ensures that the analysis is consistent with the economic model and that complications suggested by theory, such as the joint determination of the duration of unemployment and the reservation wage, are correctly dealt with.

Although these issues have not been addressed with Australian data, they have received some attention in the non-Australian literature.² In part, both the Australian and overseas literatures have been constrained by the lack of appropriate data. The framework we have used to analyse the duration of unemployment is developed in Section 4, and follows the work of Lancaster (1985), Jones (1988) and Gorter and Gorter (1993).

3. The Data Source and Reservation Wages

Before discussing the empirical model, it is useful to get a feel for the data which will be used. Section 3.1 describes the Survey of Employment and Unemployment

¹ In contrast to Brooks and Volker (1985), this study considers these transition probabilities individually and therefore cannot impose the constraint that the probabilities sum to one.

² An excellent survey of the empirical job-search literature, including structural models of unemployment duration and reservation wages, can be found in Devine and Kiefer (1991).

Patterns (SEUP) and the definition of our sample. Section 3.2 considers some descriptive evidence about the minimum acceptable wage rates reported in the SEUP.

3.1 The Sample

The SEUP is a longitudinal survey; information is collected from the same individuals over a number of years. The panel of individuals was established between April and July 1995 and includes people who were aged 15 to 59 at that time, and who were living in private dwellings in both urban and rural areas. A time line of the important events in the compilation of the SEUP data is presented in Table 1.

Table 1: Timing of Events in the Compilation of the Survey of Employment and Unemployment Patterns

Interview	Date	Period covered	Details
First	April 1995 to July 1995	5 September 1994 to 28 February 1995	Panel established Sub-groups defined
Second	September 1995 to November 1995	1 March 1995 to 3 September 1995	
Third	September 1996 to November 1996	4 September 1995 to 1 September 1996	

At the first interview, three sub-groups were defined: Jobseekers; a Population Reference Group; and persons known to have been labour-market participants. Jobseekers are defined as those who were unemployed, marginally attached to the labour force (i.e. discouraged job seekers) or under-employed in May 1995, and are the focus of this paper. The Jobseeker panel provides a far greater number of observations on episodes of unemployment than the Population Reference Group, and has a greater proportion of long-term unemployed.

At each interview, individuals are asked to divide their time over the relevant survey period (column 3 of Table 1) into periods of work, looking for work, or absence from the labour market. Clearly, these categories are not mutually exclusive as it is possible to be both working and looking for work. In this paper we focus on people who were looking for work and who were not employed at the end of the period covered in the third interview i.e. in September 1996. This

definition corresponds more closely to the more familiar concept of unemployment, than the Jobseeker definition used in the SEUP, although, given the different survey questions in the SEUP and the Labour Force survey, it satisfies less stringent activity and availability criteria.

From this sample, we retain for analysis all individuals with valid answers to all the questions used in our econometric estimation in Section 6. This resulted in a sample of 1 063 unemployed job seekers.³ Of these 1 063 individuals, around 32 per cent reported that they had been retrenched or their employer had gone out of business, 23 per cent reported that they had previously been employed in temporary or seasonal jobs, 10.5 per cent reported that they had left unsatisfactory work arrangements, pay or hours and 17 per cent reported that they had left for child care, health and other reasons. The remaining 17.5 per cent either had never worked or had not had a job since 1985.⁴

Of those unemployed job seekers who have had a job, 75 per cent have been in relatively low-skilled professions: intermediate and elementary clerical, sales, service, transport and production workers, and labourers and related workers. In contrast, only 47 per cent of employed people at that time worked in these occupations.

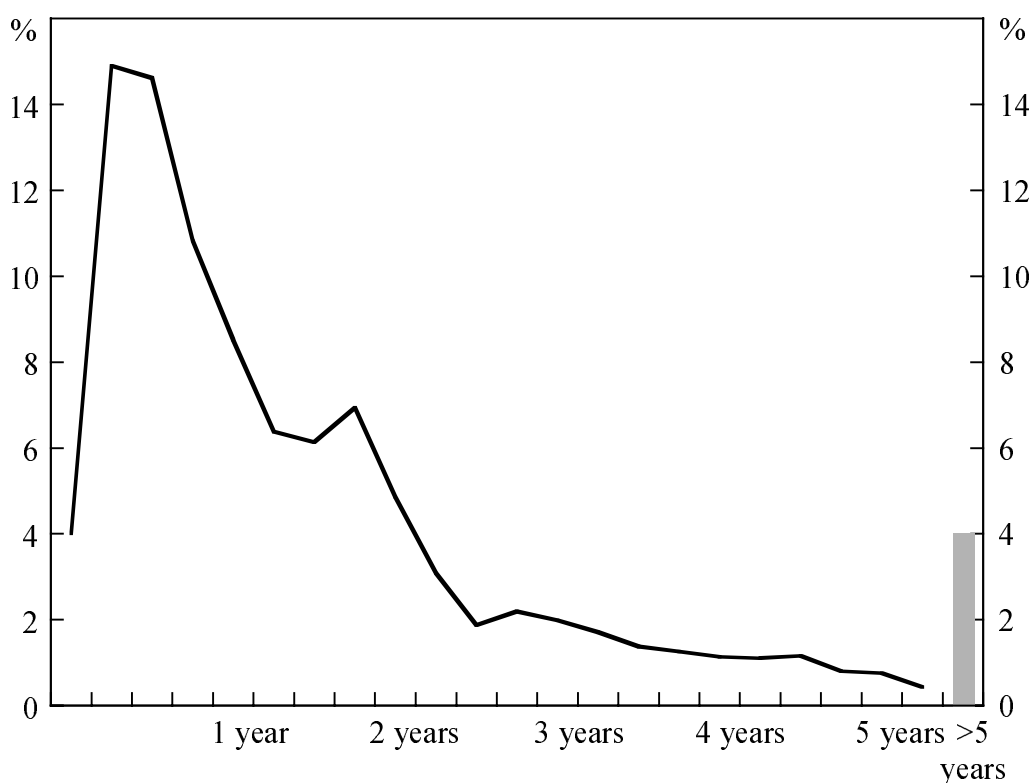
By educational attainment, 50 per cent of the unemployed sample had not achieved the highest level of secondary school. Another 19 per cent had completed the highest level of secondary school but had no further qualifications, with 21 per cent completing vocational qualifications and just 10 per cent a degree or post-graduate diploma. By comparison, the proportion of employed respondents who had not completed high school was 34 per cent and the proportion with graduate qualifications was 22 per cent, suggesting that the unemployment pool is less well educated on average.

³ Another 337 unemployed job seekers answered all questions but didn't know their hourly reservation wage. The definition of reservation wages used in our analysis is discussed in Section 3.2.

⁴ The SEUP asks unemployed people whether they have had a job since 1985. There is no labour-market information before this date.

The duration of unemployment is measured as the number of days of unemployment up to 1 September 1996.⁵ Figure 1 plots the distribution of unemployment durations.⁶ The distribution is positively skewed with 44 per cent of the sample having an unemployment duration longer than 12 months, and 4 per cent having a duration in excess of five years. The average unemployment duration is 520 days.

Figure 1: Distribution of Unemployment Duration



⁵ International studies have indicated that, at successive interviews, respondents tend to change their answers to questions concerning their labour-market status at a particular point in time. To try to ensure the reliability of retrospective data, the ABS used dependent interviewing whereby the interviewer reminds the respondent of their labour-market activity at the end of the previous period. To further facilitate accuracy in recalling the dates of events, each respondent was supplied with a calendar to record their labour-market activity; use of the calendar, however, was not compulsory.

⁶ All distributions have been estimated using kernel density estimation.

3.2 Reservation Wages

Reservation wages are collected by asking job seekers how many hours per week they would like to work and, based on those hours, what is the minimum weekly take-home pay (or reservation wage) that they would be prepared to accept if they were offered a job. Respondents indicated ranges within which their desired hours and reservation wage fell; there were 7 bands for desired hours and 30 bands for wages. For each respondent, the hourly reservation wage is calculated by dividing the midpoint of the indicated band for the reservation wage by the midpoint of the band for desired hours.

To gain some understanding of the pattern of hourly reservation wages, Table 2 gives the medians and means of the ratio of hourly reservation wages to previous hourly pay for different groups of people who were unemployed at September 1996. The first thing which is notable about this table is that the means are much greater than one. It is hard to understand why people would only accept a job if it paid more than their previous job, especially if they did not leave their last job voluntarily. The median values reported in Table 2 are, however, much closer to one.⁷

One possible explanation for the high mean ratios is that previous pay has not been indexed. We also report the median and average unemployment duration for each group to gauge the extent to which this is likely to be an issue. As the mean and median durations are not typically more than a couple of years and cover the relatively low inflation 1990s, this is unlikely to be a large effect. Measurement error may also go some way towards explaining these unrealistically high mean ratios. The dollar ranges for pay in jobs held prior to September 1994 are different to the ranges provided for reservation wages. As such, the same response to both questions may result in different hourly rates and hence, a ratio that differs from one.

Although the levels of the ratios themselves are puzzling, their relative values accord with prior intuition. The young have higher ratios than older age groups and those who were previously retrenched have lower ratios than those who left their

⁷ This is consistent with a highly skewed distribution of these ratios.

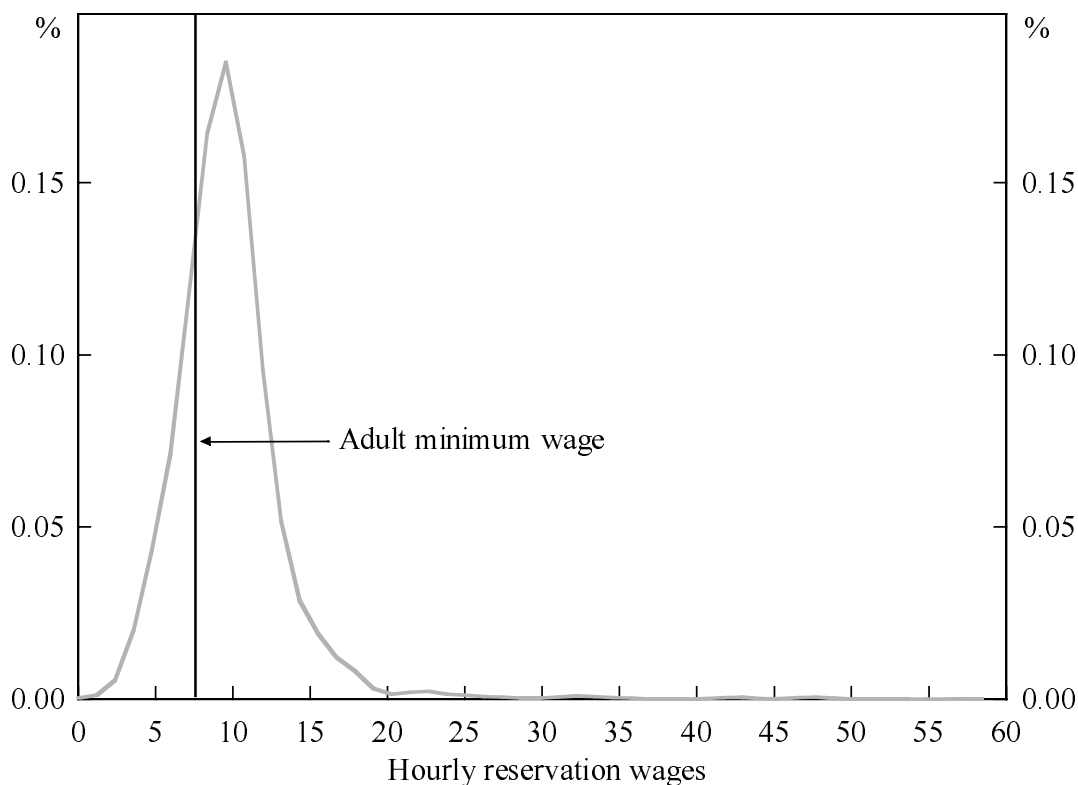
job due to dissatisfaction with working conditions. This suggests that reservation wage data are meaningful.

	Reservation wage/previous pay		Unemployment duration (in days)	
	Median	Mean	Median	Mean
Total sample	1.00	1.35	260	470
Males	1.00	1.28	261	474
Females	1.05	1.50	254	463
Age				
15 to 19	1.09	1.45	149	233
20 to 34	1.00	1.27	253	411
35 to 49	1.00	1.48	303	525
49 to 59	1.00	1.26	699	855
Reason for leaving last job				
Retrenched or employer went out of business	0.95	1.13	303	565
Previous job temporary or seasonal	1.08	1.37	153	276
Unsatisfactory work arrangements/pay/hours	1.03	1.51	168	391

It is also of interest to consider the relationship between reservation wages and minimum wages. Figure 2 plots the distribution of hourly reservation wages for unemployed job seekers as at 1 September 1996. The minimum wage reference point on this graph is an hourly wage calculated from the C14 classification in the Metal Industry Award, which was used as a benchmark minimum in the 1996 Safety Net Review. The gross level of this award is \$349 per 38 hour week. Assuming that there are no transfer payments, nor deductions, and that the individual works full-time, this translates to an after-tax hourly minimum wage of

\$7.90, and is therefore comparable to the reservation wages which are also net figures.⁸

Figure 2: Distribution of Hourly Reservation Wages



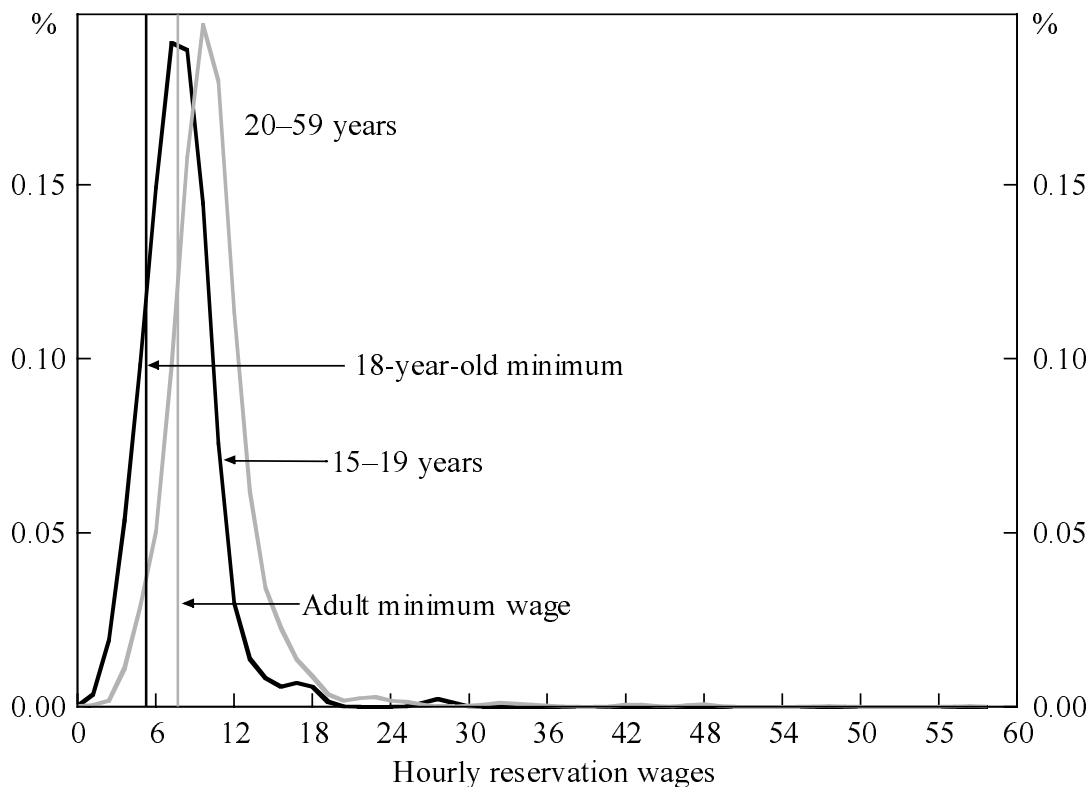
The striking feature of the graph is that around one quarter of the sample have hourly net reservation wages below the legal minimum of \$7.90 per hour. One qualification to this is that young workers are likely to face lower minimum wages as Australia has a system of age based discounts to the adult award wage that decline with age, up to the age of 21. The discount is as much as 50 per cent for 16-year-olds in some occupations and around 52 per cent of workers under 21 are employed on youth wages. Training wages and apprenticeships also provide a discount to employers with the understanding that structured training will be

⁸ The SEUP asks for reservation wages in net terms and usual weekly earning in gross terms. ABS internal research suggests that respondents answer these questions with the correct measures, although using these two different concepts is likely to increase respondent error. The idea that respondents mistakenly answer these questions using the same concept is at least tentatively supported by the ratios of hourly reservation wages to hourly pay reported in Table 2 which tend to be around 1.

provided to the employee. Around 13 per cent of young workers are paid in this manner.

Figure 3 plots the distribution of reservation wages for 15 to 19-year-olds and for those older than 19 years separately. The benchmark minimum wage used for the youth is \$5.30. This is the minimum wage paid to 18-year-old metal workers and is close to the Retail Trade Award for 18-year-olds, which covers a large number of teenage workers. Twelve per cent of teenagers report reservation wages below this benchmark, and the proportion of adult workers reporting reservation wages below \$7.90 falls to 18 per cent.

Figure 3: Distribution of Hourly Reservation Wages
By age



This evidence suggests that the minimum wage, rather than the reservation wage, may be acting as a constraint on employment, at least for some individuals.⁹ It

⁹ Miller and Volker (1987) argue that it is the minimum wage and not reservation wages which is the binding constraint on youth employment. This is based on the observation that actual youth wages are on average 25 per cent higher than reservation wages and that award wages constitute, on average, around 95 per cent of the full-time wages bill.

should also be stressed, however, that the relationship between minimum wages and reservation wages is only one element in a relatively complex relationship between legal minimum wage rates and employment levels. In particular, Figures 2 and 3 only present the supply side and have no information about the demand response of employers to lower legal minima. There are also other factors such as equity and income distribution, as well as employment consequences of a minimum wage which need to be considered when assessing its appropriate level. This is beyond the scope of the current paper.

Although we have used a benchmark minimum, it is also important to bear in mind that there is a system of award wages, which in general sits on top of the minimum wages presented in Figures 2 and 3. In many cases the relevant award wage will be the constraint facing job seekers rather than the benchmark minimum shown in the graph.

Another factor which is likely to affect the reservation wages reported by the unemployed who are expecting to earn low incomes is the interaction of the tax and transfer systems. For example, a couple earning \$349 per week from one full-time income with two children under 5 and one child aged between 5 and 12 paying \$120 per week in rent could receive as much as \$312 in social security payments.¹⁰ As family income increases, means tested social security payments will fall and tax payments will rise. If the non-working partner starts working 15 hours per week at adult benchmark minimum wages, family social security payments will fall to \$207, and taxes will rise from \$46 to \$51. Consequently, job seekers in families with significant transfer payments may report higher reservation wages because they need to be compensated for the loss of welfare payments.

4. A Structural Model of Unemployment Duration

Having described the data source and the key variables, we now turn to developing an empirical model from the underlying job-search theory. In Section 4.1 we start by looking at the individual job seeker who receives job offers which arrive randomly at a predetermined rate, with wage offers being drawn randomly from a

¹⁰ Information provided by the Department of Social Security.

predetermined wage distribution (the wage-offer distribution). From the basic model we derive the distribution of incomplete unemployment durations facing an individual when they first become unemployed.

In Section 4.2, we discuss the assumptions which are required to incorporate individual characteristics which are likely to affect the duration of unemployment. We also discuss the individual characteristics which we include in the estimation. In Section 4.3, we combine the results of Sections 4.1 and 4.2 to derive an expression for the expected log of incomplete duration for an individual. By assuming that the distribution of individuals who flow into unemployment is the same at each point in time, we can then justify estimating this expression across individuals as a cross-section regression.

4.1 Deriving the Distribution of Incomplete Duration for an Individual

Job seekers in the standard job-search framework set a reservation wage which is the minimum wage that they would be willing to accept. The reservation wage is determined by equating the expected benefits of accepting an offer with the expected costs of further search and the opportunity cost of forgoing potentially better offers. The reservation wage will be a function of things such as the costs of search, the rate at which job offers arrive and the distribution of wage offers. If these determinants do not vary with the duration of unemployment, the reservation wage and the probability of leaving unemployment will remain constant, and the model is said to be stationary.

The starting point for our analysis is to consider the hazard rate. This is the instantaneous probability of exiting unemployment for an individual, equal to the product of the probability that a job offer arrives and the probability that the individual will accept the job offer, i.e. that the wage offer lies above the individual's reservation wage. More formally, the hazard rate for individual i can be written as:¹¹

$$\theta_i = \lambda_i(1 - F_i(\xi_i)) \quad (1)$$

¹¹ The notation is intended to be consistent with Lancaster (1985), although the derivations are more closely aligned with Jones (1988).

where: θ_i is the hazard rate;

λ_i is the job-offer arrival rate;

ξ_i is the constant reservation wage; and

$F_i(w)$ is the cumulative distribution of wage offers.

If the hazard rate is constant, the distribution of completed unemployment spells, T , facing a newly unemployed individual, i , will be exponential:

$$g_i(T) = \theta_i e^{-\theta_i T} \quad (2)$$

However, the data we use from the SEUP are from currently unemployed individuals. Therefore, we are interested in the distribution of incomplete spells of unemployment rather than of completed spells. The probability of observing an individual with an incomplete duration of unemployment of length t , is the probability that the individual did not leave unemployment earlier. This probability is given by $1-G_i(t)$ for individual i , where $G_i(t)$ is the distribution function corresponding to the density function $g_i(t)$. The expression $1-G_i(t)$ is also known as the survivor function. The distribution of incomplete spells for an individual will, therefore, be the normalised survivor function:¹²

$$p_i(t) = \frac{1 - G_i(t)}{\int_0^{\infty} (1 - G_i(s)) ds} = \theta_i e^{-\theta_i t} \quad (3)$$

The final expression in Equation 3 can be obtained by integrating Equation 2 over T to obtain $G(t)$ and substituting this into Equation 3.

¹² This result can be more formally derived using the standard results from renewal theory, see Lancaster (1992).

4.2 Incorporating Individual Characteristics

In order to transform the theory into an estimable model, it is necessary to add more structure. The first step is to make an assumption about the wage-offer distribution. One of the most common and tractable assumptions is that wage offers are drawn from a Pareto distribution. This means that the probability of a given wage offer exceeding the reservation wage can be expressed as:

$$1 - F(\xi_i) = (A_i / \xi_i)^\alpha \quad (4a)$$

$$\Rightarrow \theta_i = \lambda_i (A_i / \xi_i)^\alpha \quad (4b)$$

where: A_i is the origin of the Pareto distribution, i.e. some absolute minimum wage level facing individual i ; and

α is the scale parameter which can also be interpreted as the constant elasticity of the hazard with respect to the reservation wage (ξ).

The second step is to assume that the probability of receiving and accepting a job not accounted for by the reservation wage, is an exponential function of the individual's characteristics, X_i :

$$\lambda_i A_i^\alpha = \exp(k + X_i' \beta + u_i) \quad (5)$$

The explanatory variables, represented by X_i in Equation 5, are included to capture those factors which affect the probability of receiving and accepting job offers, given the reservation wage. The job-offer arrival rate will be affected by the attractiveness of the individual to the employer. Variables which will capture this effect include educational attainment, previous occupation and reasons for leaving your last job. These variables are also likely to capture the important elements of the wage-offer distribution facing an individual. Personal characteristics such as gender, age and English language proficiency may also be important. These variables may also affect the degree of search intensity, which will in turn affect the job-offer arrival rate. Other variables which could be important for explaining search intensity include housing costs and eligibility for benefits which capture an individual's financial capacity to continue job search.

In general these variables are self-explanatory and Appendix A provides more detailed definitions. Some variables, however, have required more construction due to the design and availability of information from the survey. Eligibility for unemployment benefits is likely to be an important explainer of labour-market outcomes and has occupied a large amount of space in the job-search literature. While the SEUP collects unit record data on episodes of income support, including the value of unemployment benefits received, these data are not publicly available due to confidentiality restrictions. We have derived a proxy variable for unemployment benefit eligibility based on answers to questions concerning the main sources of income.

If the respondent was unemployed at the time of the third interview and on 1 September 1996, we classify them as eligible for unemployment benefits if social security was their main source of weekly income in the week prior to the interview. This accounts for around 80 per cent of the people that we classify as unemployment benefit recipients. If they were unemployed on 1 September 1996 but not in the week before the third interview, they are classified as eligible for unemployment benefits if their main source of income in the last financial year was social security.

In general, it is important to control for the fact that different people live in different places, because local labour-market conditions and wage rates are likely to be important. For Australia, it would be obvious to control for the state in which the individual lives as well as the section of state which describes whether the respondent lives in a rural area, a country town, a capital city, or a non-capital city. However, for confidentiality reasons, the Australian Bureau of Statistics (ABS) does not release information about the state of residence.

Instead, we control for the state of the local labour market using an index of socioeconomic disadvantage compiled by the ABS. This index measures the extent to which the local area displays characteristics such as a high proportion of low income families, low average education levels and high unemployment rates.¹³ A higher score in the index of socioeconomic disadvantage suggests that the area is less disadvantaged. The SEUP provides information about the decile of each

¹³ The local area used by the ABS for this index is the Collection District (CD) which is a small area defined by the ABS for statistical collection purposes.

individual's local area ranked by the index of socioeconomic disadvantage. Gregory and Hunter (1995) have shown that socioeconomic disadvantage and unemployment rates are highly correlated across local areas.

4.3 An Empirical Model

The objective of Section 4 is to derive an empirical model which relates the duration of unemployment to the reservation wage and other explanatory variables. We can derive an expression for the expected log of incomplete unemployment duration for a given individual as follows:

$$\begin{aligned} E(\log t_i | \theta_i) &= \int_0^{\infty} \log(s) p_i(s) ds \\ &= \int_0^{\infty} \log(s) \theta_i e^{-\theta_i s} ds \\ &= -c - \log(\theta_i) \end{aligned}$$

where c is Euler's constant ≈ 0.577 .

Therefore,

$$E(\log t_i | \xi_i, X_i) = -(c + k) + \alpha \log(\xi_i) - X_i' \beta - E(u_i | \xi_i, X_i) \quad (6)$$

In equilibrium, if the flow into unemployment is the same over time, we can treat Equation 6 as a regression model where the individuals used for estimation are a cross-section of unemployed people with incomplete durations at a particular point in time. To the extent that the assumptions made above are acceptable, the parameters of this model can be directly related to the underlying theory, and this model can be regarded as a structural model. If the assumptions which have been made are not acceptable, Equation 6 is still a valid reduced-form regression for which theory has only provided guidance as to the types of variables to include.

5. Estimation Strategy

If the conditional expectation of the error term in Equation 6 is zero and the stationary job-search framework is appropriate, then OLS estimation is the appropriate estimation strategy. However, if omitted variables result in the conditional expectation of the error term being non-zero or, if the reservation wage is dependent on unemployment duration, it will be necessary to use instrumental variable methods to ensure that parameter estimates are not biased and inconsistent.

The assumption that the conditional expectation of the error term is zero will be violated if omitted variables are correlated with other explanatory variables. In this case, theory suggests that all the variables which affect the job-offer arrival rate and the parameters of the wage-offer distribution will also affect the reservation wage. Therefore, in the case of omitted variables, there will be a correlation between the error term and the reservation wage variable which will exist even if the sample size is very large, ensuring that the OLS parameter estimates are inconsistent.

The solution to this problem is to instrument the reservation wage. The choice of instrument must be restricted to variables which directly affect the reservation wage but which do not affect the job-offer arrival rate or the wage-offer distribution. The most likely candidates are therefore variables which affect the cost of unemployment such as the level of unemployment benefits. This is discussed below.

The second assumption which must hold for OLS estimation to be appropriate is that the reservation wage has no duration dependence. If this is not true it is necessary to think about the duration of unemployment and the reservation wage as two endogenous variables in a simultaneous system. There are several arguments for why reservation wages will decline with duration. These include:

- declining job offers because employers use duration as a screening device or because human capital diminishes with time spent out of work;

- limits to search due to fixed working life, fixed assets, limited duration of unemployment benefits; and
- learning about the wage-offer distribution.

In terms of the derivation of the duration equation above, the progression from Equation 1 to Equation 2 will no longer be valid in general. However, by making specific assumptions about the relationship between the reservation wage and the duration of unemployment, Lancaster (1985) shows that it is possible to derive a tractable expression for the reservation wage equation in a simultaneous system, where the duration equation is the same as Equation 6. In particular, by assuming that the reservation wage declines exponentially as a function of the duration of unemployment, and that its minimum level is an exponential function of background characteristics, the second equation of the simultaneous system will be log linear.

$$\log \xi = -\rho \log t + Z' \gamma + k + \varepsilon \quad (7)$$

The parameter ρ will have a structural interpretation as the exponential rate of decline in reservation wages with duration, if the underlying assumptions are accepted. Regardless of whether the coefficients can be interpreted as structural estimates, the estimation of Equation 6 will still require instrumental variable techniques to deal with the endogeneity bias introduced by the log of the reservation wage. We have already argued that all the variables in X (Equation 6) must also be in Z (Equation 7). Therefore identification of our unemployment duration equation requires that there are some variables in Z and not in X . These variables are appropriate instruments for the reservation wage in estimating Equation 6. Practically, the choice of instruments will be the same as for the omitted variable single equation case discussed above.

The best candidates for instruments are variables which affect the costs of unemployment, because they affect the level of the reservation wage but are not generally considered to affect the job-offer arrival rate or the parameters of the wage-offer distribution. The most obvious candidate for an instrument is therefore the level of unemployment benefits. This is the instrument used by Jones (1988) and Gorter and Gorter (1993).

As already mentioned, the SEUP does not provide information about the level of unemployment benefits, although we have been able to construct a variable which measures eligibility. This would be a valid instrument except that it is likely to affect the degree of search intensity and hence, the job-offer arrival rate. Wadsworth (1991) provides evidence of this for the UK. Further evidence from UK data suggests that although eligibility increases the number of job-search methods used, through information and incentive effects, there is no evidence that the level of unemployment benefits has an effect (Schmitt and Wadsworth 1993). Consequently, valid instruments will be variables which affect the level of benefits rather than eligibility for benefits. The variables we have available which best fit this description are family size which will be correlated with the number of dependents and the income of the family unit. Lancaster (1985) uses the number of dependents as an instrument.

6. Estimation Results

The results of estimating the relationship between the log of unemployment duration, the log of reservation wages, and other explanatory variables are presented in Tables 3a and 3b. Table 3a presents the results required to discuss the role of the reservation wage and the use of instrumental variable (IV) techniques. Table 3b presents the estimated effects of other control variables. The OLS estimates, which are valid under the assumption that there are no omitted variables and that the reservation wage is not duration dependent, are presented in column 1. The reduced form regression of the log of the reservation wage on the explanatory variables and the instruments, which constitute the first stage of the instrumental variables procedure, are presented in column 2, and the second stage estimation results are presented in column 3.

Section 6.1 tests whether OLS or IV estimates are the most appropriate, and discusses whether the reservation wage contains useful information for explaining unemployment duration. Given evidence that OLS estimates are biased, Section 6.2 discusses the validity of the instruments which are used in the first stage of the IV estimation procedure. The results of the IV estimation are discussed more generally in Section 6.3. Results estimated for males and females separately are presented in Appendix B and are discussed in Section 6.4.

6.1 OLS versus Instrumental Variable Estimation

Hourly reservation wages have the expected sign in the OLS regression and a perverse sign in the IV estimates, although both are insignificant (Table 3a). If there are omitted variables or the reservation wage is duration dependent, the IV estimates will be unbiased, but the OLS estimate of the coefficient on the reservation wage will be biased. Whether this bias is present can be tested formally using a Hausman test.

Table 3a: Estimation Results

	Structural	Instrumental variables	
	OLS	First stage	Second stage
Dependent variable	Log duration	Log reservation wage	Log duration
Hourly reservation wage	0.105 (0.130)	–	-1.936 (1.188)
Instruments			
Log family income	–	0.041* (0.010)	–
Family size	–	0.005 (0.007)	–
Observations	1 063	1 063	1 063
R ²	0.14	0.16	n.a.
H ₀ : Overall insignificance	8.05**	7.53**	6.59**
Notes:	Standard errors in parentheses. * Denotes significance at the 10 per cent level or lower. ** All statistics have p-values of zero to four decimal places.		

The null hypothesis of the Hausman test is that the IV and OLS estimates are not statistically different, i.e. that the OLS estimates do not have a statistically significant bias. Under the null hypothesis, neither estimate will be biased although the IV estimates will be inefficient. We test this null hypothesis by estimating the log duration equation (Equation 6), replacing the log reservation wage with the predicted reservation wage and the prediction error from the reduced form reservation wage equation (Equation 8).

$$\log t_i = \mu_0 + \mu_1 \log(\hat{\xi}_i) + \mu_2 (\log(\xi_i) - \log(\hat{\xi}_i)) + X_i' \mu_3 + u_i \quad (8)$$

Testing the equality of the coefficients μ_1 and μ_2 is equivalent to testing the null hypothesis that the OLS estimates are not biased. The F-statistic for this test is 3.72 which has a p-value of 0.054.

Thus, there is some evidence to suggest that the OLS estimates are upwardly biased, and that IV is the appropriate estimation method. The insignificance of the coefficient on the reservation wage from the IV estimates suggests that although the reservation wage is of critical importance in the theoretical economic model, other factors are more important in explaining unemployment duration empirically. Gorter and Gorter (1993), using data for the Netherlands, also find no effect and attribute this to the fact that the job-offer arrival rate is the binding constraint.

It has been noted by several authors that the longer-term unemployed do not receive many job offers and that they usually accept those offers that they do receive.¹⁴ The data in the SEUP suggest that very few job offers are rejected by Australian job seekers. In sum, 72 per cent of job offers made between September 1994 and September 1996 were accepted with another 1.6 per cent rejected for another job offer and 3.9 per cent rejected because the potential employee already had a job. Only 7.5 per cent of job offers were rejected because the job was unsuitable.

One possible reason for the low level of job offers, and consequently the insignificance of the reservation wage variable, is that reported reservation wages are sometimes below Australia's award system and minimum safety net pay levels. For these respondents, changes in reservation wages are not likely to have an effect on unemployment duration, and this may bias our results away from finding a significant role for reservation wages. This explanation can be discounted, however, as the reservation wage variable remains insignificant when the unemployment duration regression is estimated for a sample restricted to respondents with reservation wages above \$10.00, which is clearly above the minimum.

¹⁴ Jones (1989) found that 85 per cent of a sample of unemployed in the UK in September 1982 accepted job offers they had received; Holzer (1988) found that 66 per cent of a sample of unemployed male youth in the USA in 1981 had not received any job offers in the previous month; and van den Berg (1990) found that job offers arrived very infrequently for a panel of Dutch men, and that 97 per cent of these offers were accepted.

6.2 Instrument Validity

Another important factor to be considered when assessing the results is the validity of the instruments which have been used. A good instrument needs to be correlated with the variable to be instrumented, the log of the reservation wage, and not significantly correlated with the variable of interest, the log of incomplete unemployment duration. From the reduced form first-stage estimates in Table 3a, it is clear that the log of family income has a more significant correlation with the log of reservation wages than does family size, although family size would be expected to have a lower correlation with the log of unemployment duration *a priori*.

Given that we have two instruments, the log of family income and family size, and only one variable to be instrumented for, we can test the validity of one instrument assuming the validity of the other. In particular, we test whether the log of family income helps explain the log of unemployment duration in a regression where family size has been used as the instrument for the reservation wage.

When this test is done, the t-statistic on the log of family income is 0.061, which is statistically insignificant.¹⁵ Thus, the over-identifying restriction that the log of family income is a valid instrument is clearly accepted. The fact that it is also highly correlated with the log of the reservation wage equation makes it a good instrument for our purposes.

6.3 General Estimation Results

6.3.1 *Factors affecting the incomplete duration of unemployment*

The focus of attention of this analysis is to understand the factors which affect the incomplete duration of unemployment. The estimated effects of variables included to control for the factors which affect whether an acceptable job offer arrives, given the reservation wage, accord with our economic priors. They are also consistent with previous estimates presented by Jones (1988) for the UK, and Miller and Volker (1987) for the youth labour market in Australia. Note that where

¹⁵ Other transformations of these instruments were considered. However, the basic result that family income is correlated with the reservation wage and uncorrelated with the log of unemployment duration, making it a good instrument, is not affected.

there are mutually exclusive and exhaustive sets of dummy variables, one category has been omitted, and the coefficients should be interpreted as the effect of having the given characteristic relative to having the omitted characteristic. These omitted categories have been included in parentheses in Table 3b.

Table 3b: Estimation Results

	OLS	IV first stage	IV second stage
Education			
Degree/diploma	-0.467* (0.160)	0.048 (0.038)	-0.351* (0.190)
Vocational qualifications	-0.102 (0.110)	0.009 (0.026)	-0.077 (0.123)
Completed high school (Less than high school)	0.023 (0.112)	0.035 (0.027)	0.087 (0.130)
Personal characteristics			
Age	0.020* (0.004)	0.006* (0.001)	0.033* (0.009)
English first language	0.105 (0.207)	-0.105* (0.049)	-0.094 (0.258)
English as a second language, high proficiency	0.086 (0.082)	-0.027 (0.020)	0.032 (0.097)
Male	0.009 (0.090)	0.005 (0.021)	0.006 (0.100)
Married	0.128 (0.097)	-0.014 (0.027)	0.181 (0.113)
Work experience			
No previous job	0.239 (0.218)	0.118* (0.052)	0.483 (0.280)
Previous hourly pay	-0.177* (0.081)	0.049* (0.019)	-0.071 (0.109)
Manufacturing	0.336* (0.123)	-0.036 (0.029)	0.262* (0.143)
Manager/professional	0.757* (0.217)	0.0100* (0.052)	0.950* (0.266)
Advanced clerical	0.053 (0.203)	0.116* (0.048)	0.275 (0.260)
Trade (Low-skilled occupations)	0.167 (0.145)	0.030 (0.034)	0.227 (0.165)
Manager in manufacturing	-1.127* (0.525)	0.063 (0.125)	-0.976* (0.590)

continued next page

Table 3b: Estimation Results *(continued)*

	OLS	IV first stage	IV second stage
Reasons for leaving job			
Temporary job	-0.555* (0.112)	0.027 (0.027)	-0.504* (0.128)
Ill health	0.246 (0.214)	-0.001 (0.051)	0.235 (0.238)
Unsatisfactory conditions	-0.126 (0.149)	0.007 (0.035)	-0.117 (0.166)
Child care	0.260* (0.150)	-0.003 (0.036)	0.242 (0.168)
(Lost job/firm bankrupt)			
Local environment			
Capital city	-0.068 (0.097)	0.078* (0.023)	0.086 (0.140)
Rural area	-0.023 (0.137)	0.062* (0.033)	0.088 (0.165)
(Other urban area)			
Index of disadvantage	0.010 (0.016)	0.003 (0.004)	0.017 (0.018)
Search incentives			
Unemployment benefit eligibility	0.611* (0.122)	-0.011 (0.031)	0.679* (0.142)
Log housing costs	-0.241* (0.060)	0.014 (0.015)	-0.194* (0.072)

Notes: Standard errors in parentheses. * Denotes significance at 10 per cent or lower.

Unemployment durations for more educated individuals are relatively low, and this is reflected in the results. The duration of unemployment for job seekers who have a degree or diploma is significantly lower than it is for those who did not complete high school. Vocational qualifications also tend to reduce unemployment duration, although this effect is not significant. The results suggest that the unemployment duration experienced by those who completed high school and did not obtain further qualifications is not noticeably different from those who did not complete high school.

Personal characteristics may also affect the probability of receiving a job offer if they are used as a screening device by potential employers or if these characteristics capture search intensity. Older workers clearly experience longer durations of unemployment, whereas other characteristics such as gender, English

language proficiency and marital status appear to have little independent effect on unemployment duration.

Previous work experience is also an indicator of the desirability of job seekers to potential employers. Those with no previous work experience do tend to have longer unemployment duration, although this is not a statistically robust result with the marginal significance and the point estimate depending on the estimation method employed. Similarly, higher previous hourly pay, which is likely to capture unmeasured features of previous work experience or individual ability, decreases unemployment duration, although the relationship is again not robust. Those who previously worked in more highly paid jobs are likely to have skills and experience that are relatively attractive to potential employers.

Job seekers who previously worked in the manufacturing industry experience significantly longer durations of unemployment. This appears to suggest that a lack of labour mobility is hampering the employment prospects of those who worked in industries subject to significant structural change. A somewhat more surprising result is that more skilled occupations, in particular managers and professionals, experience longer durations of unemployment than job seekers in low-skilled occupations. At first, this would appear to be difficult to reconcile with the fact that structural change has favoured skilled labour.

One possibility is that education and previous hourly wages capture the skill differentials between job seekers, and that the occupation variables are capturing adverse selection; unemployed individuals in an occupation with low unemployment rates tend to be of poor quality relative to their peers. As such, their unemployment is an important signal of their quality. This is in contrast to occupations with high unemployment rates where the quality of unemployed workers may not be very different to the quality of employed workers.

This result may also indicate a lack of willingness by those who were previously managers or professionals to accept work in a different area. This would be the case if managers and professionals have more occupation-specific human capital and are willing to search longer for jobs which match these skills than other unemployed people whose skills are more generic. This suggests the importance of non-wage characteristics of job offers.

Another possibility is that managers and professionals from declining industries such as manufacturing have skills specific to that industry and have difficulty finding another job. We have attempted to control for this by including an interaction variable which indicates if the job seeker was previously employed as a manager or a professional in the manufacturing industry. This variable is significantly negative, suggesting that this explanation does not have support in the data.

People who left their last job because it was temporary or seasonal have significantly lower durations of unemployment than those who were retrenched or were working for a firm which went bankrupt. Job seekers who left their jobs voluntarily because their conditions of work were unsatisfactory also experience lower durations of unemployment, although this is not statistically significant. This result supports the idea that potential employers use a job-seeker's reason for leaving last job as a screening device (and that leaving because work conditions were unsatisfactory is not deemed to be a bad signal).

However, it could also be taken to indicate that the reason for leaving the last job also measures the search effectiveness and/or preferences of the individual. This is supported by the result that people who left their jobs due to ill health or for child care reasons experience much longer durations of unemployment. While the results are not shown, it is also interesting to note that ill health and child care reasons for leaving employment are more important explanators of unemployment duration for the group of people who did not report a reservation wage. This may be another indication that for some groups, considerations other than the hourly wage are a more important measure of the acceptability of job offers.

The results presented in Table 3b also indicate that the local environment does not have a strong effect on the unemployment duration of job seekers, although this must be qualified to some extent by the lack of information about the state of residence.

Indicators of the impact of financial factors on search effectiveness are highly significant. Eligibility for unemployment benefits increases the duration of unemployment significantly. However, the construction of benefit eligibility implies that ineligibility arises either from the means test or because individuals

are only short-term unemployed, and therefore are likely to possess relatively more skills than the long-term unemployed.¹⁶ This raises some question as to whether the actual effect being captured is one of search intensity or of worker quality.

Higher housing costs are associated with significantly lower durations of unemployment. As argued earlier, this is likely to capture the effect of financial responsibilities on the degree of search effort and consequently on the probability of receiving and accepting a job offer. The result may also indicate that housing costs are correlated with skills and ability, although we believe that we have adequately controlled for this more directly through education variables and previous hourly pay.

6.3.2 Factors affecting the reservation wage

In general, the most important explanators for the reservation wage are work experience variables. Unsurprisingly, the reservation wage of individuals who have previously worked is positively correlated with the previous hourly wage. Also, individuals from more skilled professions have higher reservation wages than low-skilled workers. The highest premium appears to exist for advanced clerical workers. Perhaps more puzzling is that individuals with no previous work experience have higher reservation wages. This may indicate that these individuals have had less experience with the labour market and therefore do not assess their value to employers correctly.

Individuals from ‘other urban areas’, that is, outside capital cities, do appear to have significantly lower reservation wages, as do individuals who have English as their first language. Older individuals have higher reservation wages, which may reflect the greater degree of experience these individuals are likely to have on average. It is also interesting to note that there are several variables which are important for explaining unemployment duration which do not appear in the reduced form reservation wage equation. In particular the variables included to capture financial search incentives, eligibility for unemployment benefits and

¹⁶ Short-term unemployed may not be captured by our eligibility measure if they were unemployed in September 1996, but had left unemployment by the third interview, and had not been unemployed long enough in the year to September 1996 to say that their main source of income over the year had been social security.

housing costs, are not significant, although the signs of the point estimates are opposite to what would be expected.

6.4 Estimation Results by Gender

Although the dummy variable for gender which is included in Table 3b is not significant, it is possible that different characteristics influence the outcomes of males and females differently. To this end we have estimated the factors which affect the duration of unemployment and the reservation wages of males and females separately. The results are presented in Appendix B.

The log of family income significantly affects the reservation wages of both genders, although it is interesting that the point estimate of this effect is larger for females. Having obtained a degree or diploma significantly increases the reservation wages reported by males, but does not directly affect their duration of unemployment. For females, however, degree or diploma qualifications do not affect the reservation wage, but do decrease the duration of unemployment.

Older individuals, male or female, have both higher reservation wages and longer durations of unemployment. The reservation wage effect possibly reflects unobserved experience, although it is difficult to use this interpretation to explain the positive correlation with the duration of unemployment. If unobserved experience also captures a higher level of specialised skills, older individuals may require more compensation for these skills to accept a job offer, but they may also be more specific about which jobs they will apply for, which is consistent with a longer duration of unemployment. English speaking ability does not appear to affect the reservation wages of females, but decreases the reservation wages reported by males.

Previous work experience and marital status are more important factors for determining the unemployment duration of males. This probably reflects the fact that women, especially married women with families, are generally more likely to leave the labour force than are males. The unemployment duration of females, is more dependent on observable measures of quality such as educational attainment than on recent labour-market experience. This may also reflect the fact that females

have less continuous labour-market participation. The aggregate result that work experience affects reservation wages is driven by the male respondents in the sample.

7. Conclusions

The aim of this analysis was to understand the factors which affect the duration of unemployment within the context of the basic job-search model. The analysis differed from much of the previous analysis of this question for the Australian labour market because our data provided information on a wide cross-section of Australian job seekers, and our empirical model was derived directly from job-search theory. It was possible to estimate this model because our data included information about the reservation wage which, despite being the central focus of economic models, is frequently unavailable in survey data. In addition, this paper estimates a model which allows for reservation wages and unemployment duration to be jointly determined, which has not been the focus of past papers.

The results also suggest that although the reservation wage plays a central role in the theory, it is not a significant factor in explaining incomplete unemployment spells. The key binding constraint on gaining employment is the probability of receiving a job offer. One possible explanation for the low job-offer arrival rate is that minimum wages are too high. Evidence presented in Section 3 showed that a significant proportion of job seekers have reservation wages which lie below the minimum wage, although direct comparison is complicated by the system of award wages and age discounts and potential measurement differences. Further evidence in Section 6, however, suggests that minimum wages cannot be the full explanation for why reservation wages are not important determinants of the duration of unemployment.

Job-search theory also suggests that factors which affect the probability of receiving a job offer given the reservation wage should be controlled for. We found that variables which capture the attractiveness of the job seeker to potential employers such as past work experience and educational attainment, and factors which influence the search effectiveness of job seekers such as eligibility for unemployment benefits were important for explaining unemployment duration.

What is clear from this analysis is that the basic job-search model which focuses on reservation wages is not sufficient for explaining the duration of unemployment experienced by different individuals. Future research should aim to understand the impact of institutions such as minimum and award wages on the demand for labour, how active the unemployed are in applying for jobs, and the importance of non-wage characteristics on job offers. This will involve developing empirical models which jointly consider firms' decisions to offer jobs, and individuals' decisions to accept or reject them.

Appendix A: Data

The following variables take the value 1 when the characteristic is present and 0 otherwise:

- personal characteristics: married, male;
- previous work experience: no previous job, manufacturing, manager, advanced clerical, trade, (low skilled), manager-manufacturing;
- education: degree/diploma, vocational qualifications, high school, (less than high school);
- section of state: capital city, rural area, (other urban); and
- left previous job due to: temporary or holiday job, ill health, child care, unsatisfactory work/pay/hours, (lost job or worked for bankrupt firm).

Log unemployment duration

The log of the number of days of job search, in which there have been no concurrent working episodes. For jobs prior to September 1994, the end date of the last full-time job is considered prior to the last part-time job.

Log of hourly reservation wages

The log of reservation wages divided by desired hours. As data for desired hours and reservation wages are reported in ranges we take the midpoints of each range. For the range 49 hours and over we arbitrarily choose 49 hours. For the highest reservation wage we use \$1 179.50.

Family size

Family size as recorded at the Wave 2 interview. As family size is only recorded for families larger than 1, we replace missing value with a value of 1.

Log of current income of family unit

Records the dollar value of the midpoint of the decile of the family's current weekly income.

Age

Midpoint of the range for age recorded by SEUP.

English first language

Equals 1 if their first spoken language was English and they usually speak English in the home. Equals 0 otherwise.

English language proficiency

English language proficiency as recorded at the Wave 1 interview. This is a self-evaluated measure. Equals 0 if first language is English, equals 1 if English is not the first language but is spoken very well, etc through to 5 if the respondent does not speak English.

Unemployment benefit eligibility

Equals 1 if the respondent is considered eligible for unemployment benefits. If the respondent was unemployed in both the person-level data and in our sample which is based on the episodal data, they are said to be eligible for unemployment benefits if their main source of weekly income in the week prior to the interview was social security. This accounts for around 80 per cent of the people who end up being classified as unemployment benefit recipients. If they were unemployed at the end of Wave 2 but not at the interview, they are classified as eligible for unemployment benefits if their main source of income in the last financial year was social security. Therefore, those who are not classified as eligible will include some individuals who were eligible, but whose unemployment spell at the end of Wave 2 was not long enough to report unemployment benefits were their main source of income over the year and who left unemployment before the interview date.

Housing costs

Dollar value of the midpoint of the decile in which housing costs of the respondent fall. Housing costs include principal repayments on loans as well as interest costs and rent for renters.

Socioeconomic disadvantage of collection district

The ABS's index of socioeconomic disadvantage for collection districts measures the extent to which the local area displays characteristics such as a high proportion of low income families, low average education levels, employed labourers and high unemployment rates.¹⁷ A higher score in the underlying index of socioeconomic disadvantage suggests that the area is less disadvantaged. The SEUP provides information about the decile of each individual's local area ranked by the index of socioeconomic disadvantage.

Hours in previous job

We first take the midpoint of the range of hours that the respondent previously worked. If the respondent didn't have a job post September 1994, we take the response to the person-level question concerning usual hours in last full-time job. If there is no previous full-time job we take the last part-time job. If there was no previous job we replace missing values with 0.

Wage in last full-time job

We first take the midpoint of the range of wages that the respondent previously worked for. If the respondent didn't have a job post September 1994, we take the response to the person-level question concerning usual weekly income in last full-time job. If there is no previous full-time job we take the last part-time job. If there was no previous job we replace missing values with 0.

¹⁷ The local area used by the ABS for this index is the Collection District (CD) which is a small area defined by the ABS for statistical collection purposes.

Log hourly pay

Is the log of the ratio of the wage in last job to hours in last job. Equals 0 if there is no last job recorded.

Appendix B: Results**Table B1: Two Stage Estimation Results by Gender**

	Males		Females	
	First stage (dependent variable)	Second stage	First stage (dependent variable)	Second stage
Hourly reservation wage	(dependent variable)	-3.175* (1.831)	(dependent variable)	-0.681 (1.596)
Instruments				
Log family income	0.038* (0.013)	–	0.043* (0.018)	–
Family size	0.001 (0.009)	–	0.009 (0.015)	–
Education				
Degree/diploma	0.091* (0.047)	-0.080 (0.316)	-0.005 (0.068)	-0.559* (0.266)
Vocational qualifications	0.017 (0.031)	0.016 (0.170)	-0.014 (0.050)	-0.215 (0.199)
Completed high school	0.049 (0.032)	0.092 (0.195)	0.051 (0.049)	0.146 (0.193)
(Less than high school)				
Personal characteristics				
Age	0.007* (0.001)	0.041* (0.014)	0.005* (0.002)	0.026* (0.010)
English first language	-0.187* (0.062)	-0.685 (0.471)	-0.015 (0.087)	0.275 (0.343)
English as a second language, high proficiency	-0.062* (0.025)	-0.262 (0.178)	0.017 (0.033)	0.270* (0.135)
Married	0.013 (0.033)	0.392* (0.173)	-0.055 (0.048)	0.047 (0.175)
Work experience				
No previous job	0.182* (0.062)	0.818* (0.481)	0.027 (0.095)	0.082 (0.376)
Previous hourly pay	0.071* (0.023)	0.039 (0.188)	0.011 (0.035)	-0.179 (0.140)
Manufacturing	-0.032 (0.033)	0.404* (0.189)	-0.053 (0.061)	-0.051 (0.256)
Manager/professional	0.099 (0.062)	0.977* (0.369)	0.058 (0.093)	0.888* (0.385)

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Table B1: Two Stage Estimation Results by Gender *(continued)*

	Males		Female	
	First stage	Second stage	First stage	Second stage
Advanced clerical	0.113* (0.064)	0.657 (0.402)	0.103 (0.087)	-0.091 (0.342)
Trade	0.043 (0.035)	0.282 (0.203)	-0.056 (0.107)	0.461 (0.433)
(Low-skilled occupations)				
Manager in manufacturing	0.079 (0.129)	-0.880 (0.719)	-0.172 (0.388)	-0.973 (1.549)
Reasons for leaving job				
Temporary job	0.012 (0.030)	-0.501* (0.165)	0.081 (0.054)	-0.593* (0.246)
Ill health	-0.020 (0.059)	0.289 (0.321)	0.030 (0.101)	-0.063 (0.402)
Unsatisfactory conditions	0.047 (0.040)	-0.151 (0.236)	-0.041 (0.071)	0.125 (0.291)
Child care	-0.052 (0.050)	0.247 (0.290)	0.054 (0.059)	0.118 (0.245)
(Lost job/firm bankrupt)				
Local environment				
Capital city	0.071* (0.027)	0.202 (0.195)	0.094* (0.043)	-0.017 (0.225)
Rural area	0.028 (0.037)	0.140 (0.207)	0.119* (0.065)	-0.018 (0.304)
(Other urban area)				
Index of disadvantage	0.001 (0.004)	0.020 (0.024)	0.005 (0.007)	0.008 (0.030)
Search incentives				
Unemployment benefit eligibility	-0.023 (0.038)	0.474* (0.195)	-0.025 (0.057)	0.883* (0.213)
Log housing costs	0.010 (0.017)	-0.293* (0.099)	0.013 (0.027)	-0.058* (0.111)
Observations	682	682	381	381
R ²	0.23	n.a.	0.10	n.a.
H ₀ : Overall insignificance	7.79**	4.00**	1.64**	3.52**

Notes: First stage dependent variable: hourly reservation wage. Second stage dependent variable: log incomplete duration of unemployment. Standard errors in parentheses. ** P-value is less than 5 per cent. * Denotes significance at the 10 per cent level or lower.

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