Disaggregated Models of Unemployment in Australia*

Jeff Borland
Department of Economics
The University of Melbourne

Melbourne Institute Working Paper No. 16/00

ISSN 1328-4991
ISBN 0 7340 1498 8

September 2000

*This paper is the result of work being undertaken as part of a collaborative research program entitled 'Unemployment: Economic Analysis and Policy Modelling'. The project is generously supported by the Australian Research Council and the following collaborative partners: Commonwealth Department of Family and Community Services, Commonwealth Department of Employment, Workplace Relations and Small Business and the Productivity Commission. The views expressed in this paper represent those of the authors and are not necessarily the views of the collaborative partners.

Melbourne Institute of Applied Economic and Social Research
The University of Melbourne
Victoria 3010 Australia
***Telephone* (03) 8344 5330**
***Fax* (03) 8344 5630**
***Email* melb.inst@iaesr.unimelb.edu.au**
***WWW Address* http://www.melbourneinstitute.com**

Abstract

This paper reviews evidence on causes of unemployment in Australia from disaggregated modelling of the labour market. Three main types of modelling are considered. First, information on unemployment rates of labour force participants with different skills is presented, and analyses that seek to explain why unemployment varies between skill groups are described. Second, descriptive evidence on unemployment rates by state and neighbourhood is presented, and possible causes of regional differences in unemployment rates are assessed. Third, descriptive information on the distribution of unemployed persons by duration of unemployment spell is presented, and studies of the determinants of the duration of unemployment spells are summarised.

1. Introduction

The objective of this paper is to review evidence on causes of unemployment from disaggregated labour market modelling. Three topics (which are the main areas where research on unemployment for disaggregated population groups has been undertaken in Australia) are reviewed. First, evidence on differences in unemployment rates for workers with different skill characteristics is examined, and studies of the causes of skill-based unemployment rate differentials are reviewed. Second, differences in unemployment rates between persons living in different regions in Australia are analysed, and possible causes of those regional differences are reviewed. Third, descriptive information on the distribution of unemployed persons by duration of unemployment spell is presented, and research on long-term unemployment and on the determinants of the duration of unemployment spells is summarised.

2. Rate of unemployment by skill

a. What is skill?

To characterise differences in rates of unemployment between workers with different skills it is first necessary to define what is meant by skill. One approach is to use observable characteristics such as an individual's age/experience, education attainment or occupation as a proxy for skill. A second approach is to define workers' skill levels as corresponding to their wages (for example, Juhn et al., 1991). A third approach is to define skills in a more fundamental way – relating for example to the cognitive ability, motor skills, and inter-personal skills required a worker's job (for example, Pappas, 1998).

The studies that will be reviewed in this paper for the most part have adopted the first of these approaches. This approach can be criticised on the grounds that, for example, occupation is a very crude proxy for skill; but it has the advantage of being easier to implement than the alternative approaches which require prediction of wages and skill characteristics for unemployed persons.

b. How unemployment varies by skill

Table 1 and Figures 1a to 1d present descriptive information on rates of unemployment for labour force participants classified by age, educational attainment, and occupation. At any point in time participants who are younger, have lower levels of education attainment, and are in blue collar occupations, have relatively higher rates of unemployment. Hence, each of these proxies for skill suggests that unemployment rates are higher for low skill than high skill labour force participants. The absolute cyclical sensitivity of the rate of unemployment is also higher for low skill than high skill workers – for example, the rate of unemployment for participants with a degree or above increased from 4.3 to 6.2 per cent between 1990 and 1993; whereas the rate of unemployment for participants who had not completed high school rose from 8.8 to 14.8 per cent. However, in proportionate terms, the cyclical variation in rates of unemployment by skill groups are relatively similar.

Econometric evidence from cross-section data sets also finds a significant relation between the probability of unemployment and proxies for skill or human capital. (For a review see Le and Miller, 2000. Some recent studies are Harris, 1996; Miller and Neo, 1997, and Borland and Kennedy, 1998). First, all studies find that the probability of unemployment is inversely related to education attainment. For example, using data from the ABS 1994/95 Income Distribution Survey, Borland and Kennedy (1998, Table 5) estimate the probability of unemployment for a labour force participant with a degree to be 2.3 per cent, and for a participant with no post-school qualification to be 8.5 per cent. Second, studies that include age variables generally find that the relation between age and the probability of unemployment is decreasing from 15 to 24 years, and thereafter is relatively constant, perhaps with a slight positive relation post 50 years (see Le and Miller, 2000, pp.79-80). Third, country of birth and English language ability is found to affect unemployment. For example, Miller and Neo (1997) find that immigrants from non-English speaking background countries have a higher probability of unemployment than labour force participants who are native-born or are immigrants from English-speaking background countries. The unemployment disadvantage is lower for those immigrants with longer duration of residence in Australia, and is also decreasing with English-speaking ability.

A dynamic perspective on the nexus between skill level and unemployment is provided in recent research by Dunlop (2000). This study examines labour market transitions for low wage and high wage workers using longitudinal data for 1995 to 1997 from the ABS Survey of Employment and Unemployment Patterns. The main finding from that study (relevant to this paper) is that low wage workers (defined as having earnings less than $10.12 in 1995 dollars) have a higher probability of moving to joblessness than high wage workers. Over a one-year horizon from 1995 to 1996 the respective probabilities of moving to joblessness are 13.8 per cent and 6.4 per cent; and over a two-year horizon from 1995 to 1997 the respective probabilities are 20.1 per cent and 8.6 per cent. From amongst the group of low wage workers the main determinant of the probability of moving to joblessness appears to be recent employment history (an increase of 10 per cent in weeks worked in the previous 12 month period lowers the probability of moving to joblessness by about 3 per cent).

Table 1: The distribution of unemployment - Civilian population aged 15 years and over - Australia – February 2000

	Rate of UE	Percentage of Labour Force	Percentage of Unemployed
1. Age			
15-19	19.0	8.7	21.8
20-24	10.9	11.9	17.2
25-34	7.3	24.5	23.8
35-44	5.6	25.0	18.8
45-54	4.4	21.2	12.5
55-64	5.1	8.7	5.9
2. Education			
Degree or above	3.5	16.7	7.0
Diploma	4.7	8.9	5.0
Vocational qualification - skilled	6.1	12.6	9.0
Vocational qualification - unskilled	8.6	9.6	9.7
Completed HS	8.9	18.7	19.6
Not completed HS	12.5	33.5	49.7
3. Occupation			
Manager/administrator	0.8	7.1	1.7
Professional	1.8	17.8	10.1
Associate Professional	2.5	11.3	9.0
Tradespersons	3.4	13.5	14.6
Advanced clerical/service	1.7	4.5	2.4
Intermediate clerical/sales/service	3.0	17.0	15.9
Intermediate production/transport workers	4.2	8.9	11.9
Elementary clerical/sales/service	3.9	9.8	12.1
Labourers and related workers	6.8	10.1	22.3
4. Industry			
Agriculture	3.4	5.0	5.3
Manufacturing	4.3	12.7	17.4
Construction	4.2	7.9	10.4
Wholesale Trade	2.7	5.4	4.5
Retail Trade	3.2	15.0	15.3
Accommodation etc.	5.2	5.0	8.3
Transport/storage	2.7	4.4	3.8
Business and property services	3.3	11.0	11.4
Government administration	2.7	3.9	3.3
Education	2.0	6.3	4.0
Health and community services	1.6	9.2	4.8
Recreation services	2.2	2.5	1.8
Personal services	2.4	4.0	3.1
5. Immigrant status			
Australian-born	7.4	75.1	73.5
Immigrant	7.4	24.9	24.7
Time of arrival:			
pre-1976	5.7	10.0	7.8
1976-1985	7.3	5.6	5.5
1986-1995	7.9	6.5	7.0
post-1995	12.4	2.8	4.4

Notes: Unemployment rates by education are for the civilian population aged 15 to 64 years and for May 1998. Labour force and unemployment by occupation and industry include as employed all persons employed in the respective occupation or industry at the time of the survey, and as unemployed all persons who were unemployed at the time of the survey, who had worked for at least two weeks full-time in the previous two years and whose last job was in the respective industry or occupation.

Figure 1a: Rate of Unemployment by Age - Civilian Population - Australia - 1970 to 1999(August)

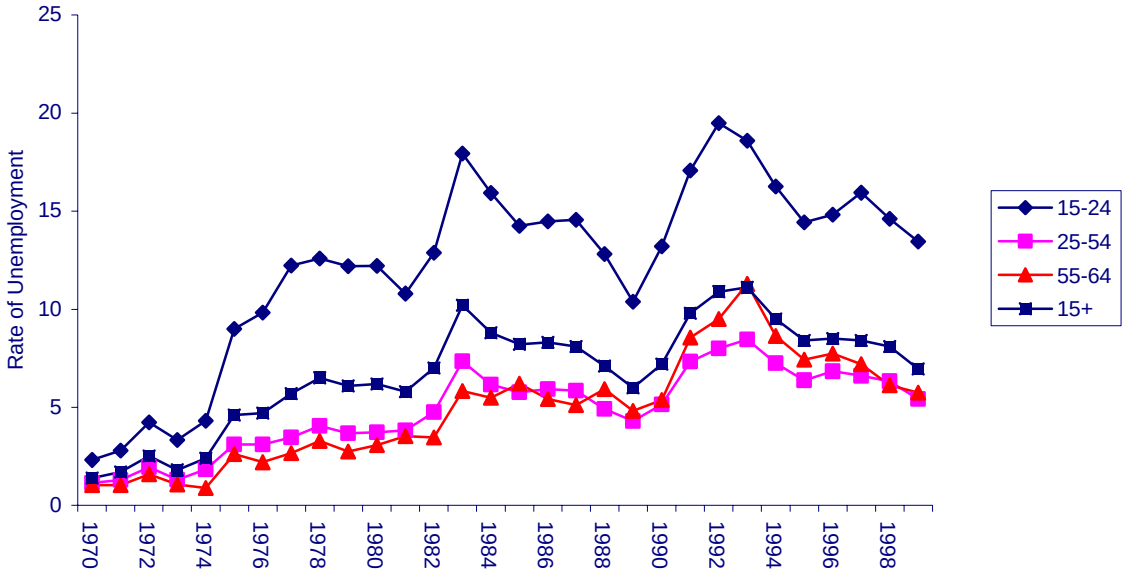


Figure 1b: Rate of Unemployment by Educational Attainment - Civilian Population - Australia - 1982 to 1998

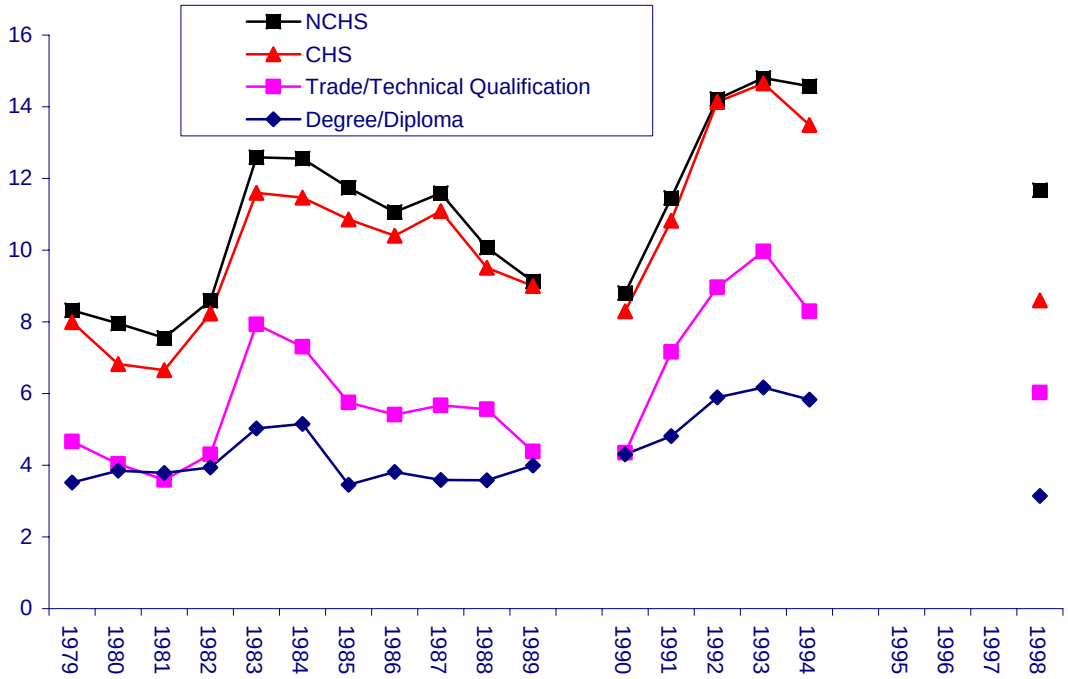


Figure 1c: Rate of Unemployment by Occupation of Last Full-Time Job - Civilian Population - Australia - 1986 to 1995(August)

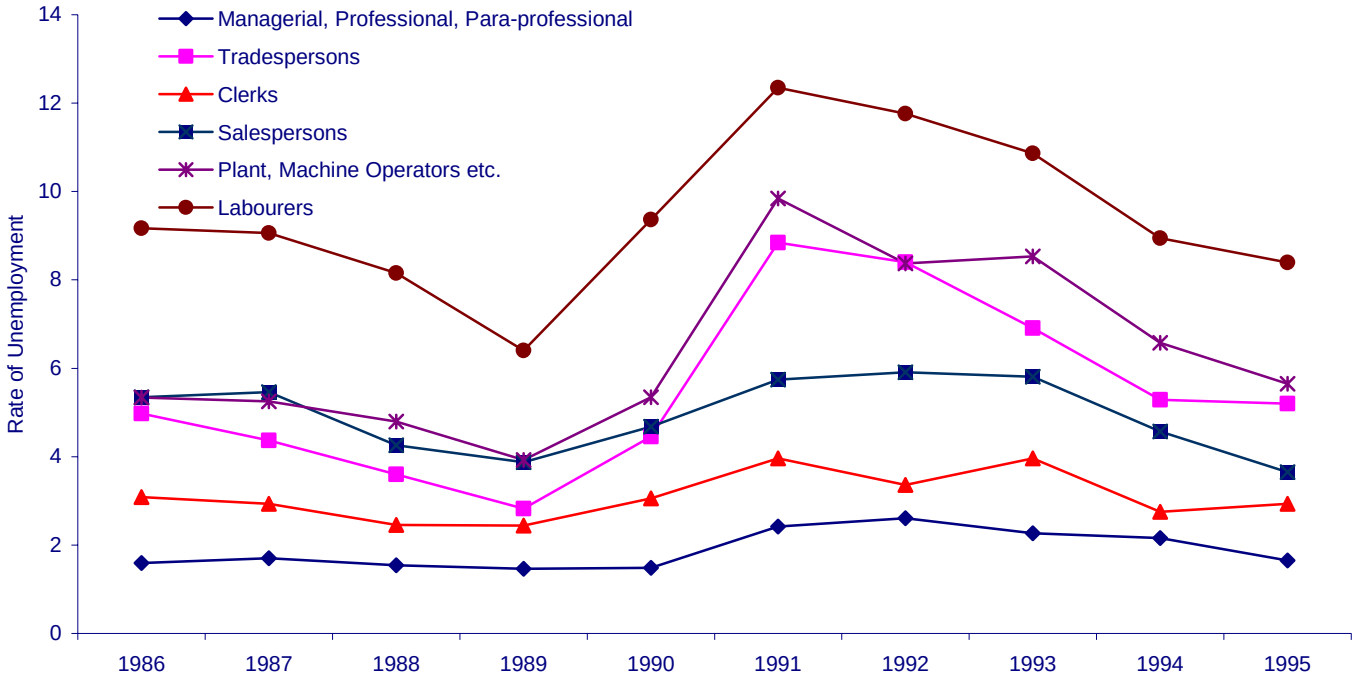
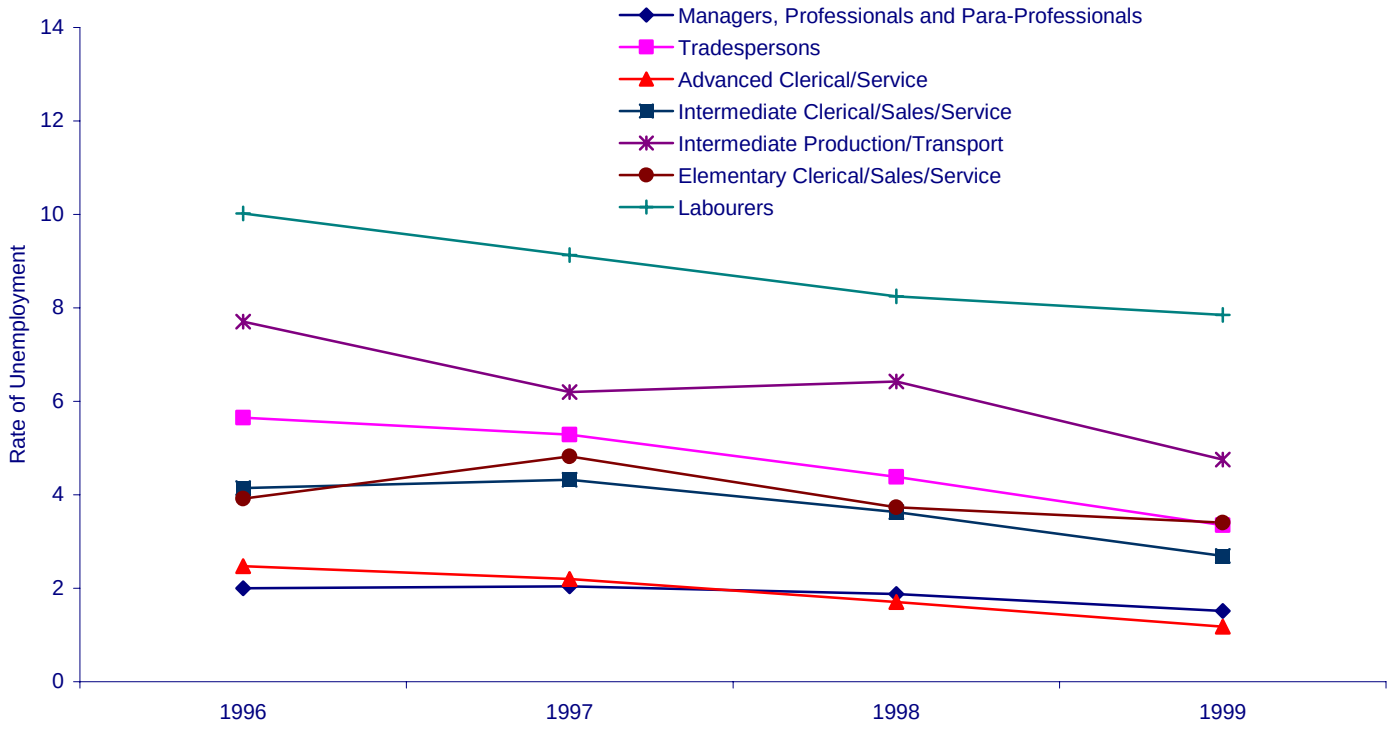


Figure 1d: Rate of Unemployment by Occupation of Last Full-Time Job - Civilian Population - Australia - 1996 to 1999(August)



c. Why unemployment varies by skill?

This sub-section has two main parts. First, a review of empirical research on causes of unemployment by skill is presented. Second, the implications of the empirical research for theories of why unemployment varies by skill is assessed.

One approach to understanding the causes of differences in rates of unemployment between skill groups in Australia, used in Vickery (1999) and Jackman et al. (1997), seeks to decompose changes in rates of unemployment for disaggregated skill groups between components that can be explained by shifts in aggregate labour demand and relative labour demand. Aggregate demand shifts can be thought of as changes in labour demand that are neutral with respect to skill (that is, there is an equiproportionate change in labour demand for each skill group), whereas relative demand shifts involve changes in labour demand that are non-neutral between skill groups. This decomposition is of interest as one explanation for why rates of unemployment are higher for low skill than high skill groups is that there has been an increase in the relative demand for high skill labour and a decrease in relative demand for low skill labour that has not been accompanied by any change in relative wages of those groups.

To undertake the decomposition Vickery (1999) follows the approach of Nickell and Bell (1996). In their model the equilibrium wage and employment (unemployment) outcome for each skill group is determined at the intersection of labour demand and wage-setting curves that are specific to each group. Changes in the rate of unemployment for each skill group can occur as a result of neutral or non-neutral shifts in labour demand, or as a result of shifts in the wage-setting curve for each skill group.

To undertake the decomposition Nickell and Bell (1996) assume that all of the change in the rate of unemployment of a (base) high skill group in some period can be explained by a neutral shift in aggregate labour demand. The same neutral shift in aggregate labour demand is then applied to other skill groups (with assumptions on the elasticity of the labour demand and wage curves for those groups) to estimate how much of the change in unemployment rates for those groups can be explained by the same aggregate demand shift.

Vickery (1999) applies this method to data on rates of unemployment by education in Australia between 1979 and 1994. He concludes (p.20) that "…the evolution of unemployment across different education groups can be explained almost entirely by changes in the aggregate unemployment rate". Similarly, Jackman et al. (1997) using a related approach find that virtually none of the increase in the aggregate rate of unemployment in Australia between 1979 and 1993 can be attributed to changes in relative demand and supply for labour by education group and relative wage changes between those groups.

Hence these studies suggest that neutral changes in aggregate demand for labour can explain shifts in the rates of unemployment for workers with different levels of educational attainment. To understand this result consider the basic modelling framework from which the result is derived. Suppose that we are trying to understand why the absolute increase in the rate of unemployment for low skill workers is higher than for high skill workers during a contractionary period. With a specification of the wage-setting curve that has a constant elasticity relation between wages and unemployment, a neutral negative aggregate demand shock will reduce wages and increase the rate of unemployment by an equiproportionate amount for low skill and high skill workers. But given that the initial rate of unemployment for low skill workers will have been higher than for high skill workers, the absolute increase in the rate of unemployment for low skill workers will be higher than for high skill workers.

The finding that changes in rates of unemployment by skill category can be explained solely by neutral changes in aggregate labour demand, and do not appear to have been due to changes in relative labour demand by skill group, may seem puzzling given other evidence that changes in relative labour demand by skill have occurred. (Not a great amount of Australian evidence exists on this issue. However there is now an extensive international evidence that suggests international trade and technical change have caused an increase in relative demand for high skill and a decrease in relative demand for low skill labour – see for example, Katz and Autor, 1999). However, it appears that the seeming inconsistency can be explained by evidence that changes in labour supply by skill group have matched changes in labour demand by skill group over the past 25 years so that no significant imbalance labour demand and labour supply by skill

categories has developed (see for example, Borland, 1996 on the co-movement of changes in shares of employment and labour supply by education attainment).

The second approach to understanding differences in rates of unemployment by skill category has involved analysis of labour market flows data. Vickery (1999) applies data from the ABS Survey of Employment and Unemployment Patterns for 1994 to 1996 to decompose differences in rates of unemployment across education groups between the effects of different rates of entry into unemployment from employment and of different rates of exit from unemployment to employment. He concludes (p.31) that '…high unemployment of less educated workers can be attributed to two main factors: (i) a less educated worker has a greater probability of exiting employment each period…; and (ii) once not employed, a less-educated worker has a smaller probability of finding employment….These two influences are of approximately equal importance'. In an earlier study, (and by contrast) using data on gross flows from the ABS Labour Force Survey for 1979-1980, Foster and Gregory (1982) find that most of the difference in rates of unemployment between teenagers and adults is explained by a higher rate of entry into unemployment for teenagers than adults.

Empirical analyses have therefore provided some evidence on the extent to which unemployment rate differentials between skill groups can be explained by neutral aggregate demand shifts, and shifts in relative labour demand across skill categories; and by inflows to and outflows from unemployment.

What are the implications of the empirical analyses for theories of unemployment rate differentials by skill category? Three main types of theories have been proposed. First, some theories emphasise the role of changes in relative wages by skill groups, or inflexibility in relative wages in response to changes in relative labour demand and labour supply by skill category, as an explanation for unemployment rate differentials. A second group of theories focus on the way that firms' dismissal and hiring decisions are made. For example, with regard to dismissals human capital theory suggests that workers with relatively less firm-specific human capital are more likely to be laid off during a contractionary period. And 'ranking' theories of unemployment suggest that in making hiring decisions firms will choose from the available pool of applicants those with the highest observable indices of skill such as education attainment. According to

this second group of theories differences in the level of and changes in rates of unemployment by skill group can be explained by aggregate demand shifts, and do not require changes in relative labour demand by skill group. The third set of explanations involves institutional factors. For example, with the same level of unemployment benefit available for all unemployed persons regardless of skill level, it means that replacement rates will be higher for low skill than high skill unemployed (see Gregory, 1996, Table 5). Hence, the incentive to exit unemployment may be lower for low skill than high skill unemployed. This suggests that differences in the level of unemployment between low skill and high skill may be explained by unemployment benefits, and that changes in unemployment rate differentials could also be potentially be explained by changes in the relative replacement rates of low skill and high skill unemployed (as the potential earnings of those groups changes).

Studies of relative earnings by skill suggest that the earnings structure in Australia has been relatively stable over the past 20 to 30 years. For example, Vickery (1999) presents evidence that earnings by education and occupation have been stable from the mid 1970s onwards; and Borland and Kennedy (1998) show that earnings differentials between workers by experience level has been stable from the early 1980s onwards.

What does the evidence on relative wages imply about the relation between relative wages and unemployment rates by skill category? The finding from Vickery (1999) and Jackman et al. (1997) that relative demand shifts have not been an important source of changes in unemployment rates by skill group indicate that, even though relative wages have been stable, this cannot be considered a source of unemployment since no relative wages changes were required to accommodate changes in labour demand (since changes in relative labour supply had performed this role).

It could still however be that a reduction in wages of low skill to high skill workers would reduce the unemployment rate differential between those groups. For example, this is what would be predicted in the simple theoretical framework described above, were the wage-setting curve for low skill workers to be shifted downwards.

Empirically, the response in employment to a change in relative wages by skill (or more specifically a reduction in real wages for low skill workers) will depend on the wage

elasticity of employment for low skill workers. Evidence on this issue is reviewed in Borland and Woodbridge (1999, pp.111-112) for the case of youth labour. A summary of findings from research on the wage elasticity of employment for youth is presented in Table 2.

Borland and Woodbridge argue that it is difficult to come to a strong conclusion on the magnitude of own-wage elasticities for young workers in Australia from existing research. Only a few studies have been undertaken, the results of those studies have varied quite widely, and their methodologies have been subject to considerable criticism.

Perhaps the best known study is that of Lewis (1985) which found quite large own-wage employment elasticities for young males and females (-1.80 and -4.58 respectively). Problems relating to model specification and data quality - acknowledged in Lewis' article - have though raised doubts about the robustness of those results. More recently, Daly et al. (1998) use workplace-level data to examine the determinants of youth employment and find similarly large own-wage employment elasticities of -2 to -5 in industries with relatively high proportions of youth employment. However, this study has also been subject to some criticism - most particularly relating to construction of the wage variable used in regression analysis. There is one other study - by Vella and Mackay (1986) - which finds relatively large own-wage type elasticities for youth employees (equal to -2.1 in the long-run). This study appears more satisfactory from a methodological point of view; but its limitation is that it is an analysis of the effect of a change in wage subsidies on commencements in a training program for unemployed youth. Hence it is difficult to know to what extent the findings can be extended to the whole youth labour market.

Table 2: Wage Elasticity of Labour Demand for Youth - Australian Studies

Study	**Details**	**Findings**
Merrilees (1979)	Teenagers - Australia - 1966 to 1978 - Effect on employment of change in ratio of earnings of teenagers to earnings of adults	Employment significantly related to labour cost ratio. Own-wage elasticity - Males -1.0; Females -1.5.
Merrilees (1984)	Apprentices - Metal trades; Electrical trades; Building; Printing; and Motor mechanics - State-level data - 1960s to 1980s - Effect on employment of labour cost ratio for apprentices to semi-skilled tradesperson assistants	Employment not significantly related to labour cost ratio for 4/5 trades. Only significant effect in metal trades where elasticity is -0.96 (significant at 1% level).
Lewis (1985)	Persons aged under 21 years - Industry-level data - 1975 to 1981 - Effect on employment of average weekly earnings.	Employment significantly related to average weekly earnings. Own-wage elasticity - Males = -1.80; Females = -4.58.
Vella and Mackay (1986)	Special Youth Employment Training Program (SYETP) commencements - Australia - 1978 to 1983 - Effect on employment of ratio of wage for SYETP participant to average junior award wage	Commencements significantly related to labour cost ratio. One per cent reduction in SYETP wage increases commencements by 0.66 per cent in short run, and 2.10 per cent in the long-run.
McCormack (1993)	Persons aged 15-19 years - Australia - 1966 to 1988 - Effect on employment of average ordinary time earnings of full-time junior employees.	Own-wage elasticitiicies generally insignificant. Some evidence of complementarity between junior male and junior female employees, and between adult male and male/female junior employees.
Mangan and Johnston (1997)	Youth - a) Queensland - Effect on youth employment/population ratio of ratio of junior award wage to average weekly earnings for full-time non-managerial employees - 1980 to 1995; b) Queensland/Australia - Effect on individual probability of employment of ratio of junior award wage to average weekly earnings for full-time non-managerial employees - 1991	Method a) - No significant relation between employment/population ratio and labour cost variable. Method b) - Elasticity of employment with respect to labour cost variable (15-19 years): Full-time employment - Queensland = -0.27; Australia = -0.17; Part-time employment - Queensland = not significant; Australia = not significant.
Daly et al. (1998)	Youth - Australia - Workplace-level data - 1995 - Effect on employment of average hourly wage of youth employees.	Own-wage elasticity of between -2 and -5 in industries employing a relatively high proportion of youth.

Estimated elasticities from other studies that analyse responsiveness of employment of apprentices and youth to changes in wage subsidies are much smaller. A study by Merrilees (1984) is a careful disaggregated analysis of the effects of changes in labour costs on the employment of five types of apprentices. In this study for only one group of apprentices is there found to be a significant effect of labour costs on employment. Similar to the Vella and Mackay study, the question about this study by Merrilees must be the extent to which it has application outside the labour market for apprentices. Other aggregate-level studies of youth employment by Merrilees (1979) and Mangan and

Johnston (1997) find elasticities around or below -1.0; and McCormack (1993) finds evidence of a significant negative own-wage employment elasticity only for part-time female workers. However, these studies appear to have some of the same types of problems as the aggregate-level study by Lewis.

To claim to provide a definitive opinion on the magnitude of the youth own-wage employment elasticity would - as can be seen from the preceding discussion - be most foolhardy. Probably it is not possible to do better than Merrilees (1985) who states:

> "In summary, the indirect studies point to a teenage wage elasticity of -0.5 to -1.5 with higher elasticities for females, less skilled occupations and private sector employees. Furthermore, it seems likely that the wage elasticity for younger youth (aged under 18) is somewhat higher than for all teenagers."

A wage elasticity of employment of around –1 would probably imply some small reduction in the rate of unemployment from a decrease in the relative wages of low-skill workers. For example, Borland (1999) undertakes a simple exercise of predicting the effect on the rate of unemployment from the 'Gang of 5' proposal to freeze safety net wage adjustments for four years. Using a wage elasticity of –1 it is estimated that the proposal would lower the aggregate rate of unemployment by about 1.1 percentage points over a four year period.

The argument that increases in employment of low-skill workers might be achieved by relative wage reductions has however been disputed by Gregory (1993) who argues that – regardless of large differences in earnings dispersion and in changes in earnings dispersion – employment growth for low-wage jobs was similar in Australia and the United States from the mid 1970s onwards (see also Card et al., 1996). One explanation for this finding might be that low skill workers have different levels of productivity across countries, with the level of productivity being correlated with wage floors for low skill workers in each country (Nickell and Bell, 1996).

Evidence that the main source of unemployment rate differentials by skill category has been aggregate effects provides support for theories that explain those differentials by the nature of the dismissal and hiring process. Other support for the role of firm-specific

human capital can also be found in the role of entry rates to unemployment in explaining unemployment rate differentials, and in evidence of the relation between firm-specific or job tenure and wages (for example, Preston, 1997). Some support for the theory employers discriminate between applicants for available jobs using indices such as education is presented in Vickery (1999, Table 6). There it is shown that high education workers are much more likely to be in jobs for which they are over-qualified than are low skill workers to be in jobs for which they are under-qualified.

d. Summary

- Existing evidence provides more support for explanation for low skill/high skill unemployment rate differentials based on aggregate demand shifts and dismissal/hiring policies of firms, than for theories involving shifts in relative demand for labour by skill category and relative wage inflexibility. But it should be noted that the existing evidence in not extensive.

- Ideas for future work:
    - Examine robustness of Nickell-Bell methodology (for example, reasonable to assume that whole of change in unemployment rate for high skill group is due to aggregate demand effects?); and
    - Extend modelling to allow possible sources of changes in relative demand for labour (international trade/technical change) to be explicitly studied, and that recognises Australia as an open economy (for example, Davis, 1998).

3. Rate of unemployment by region

This section reviews evidence on variation in rates of unemployment by region in Australia. A distinction is made between studies that have examined state-level variation and intra-state variation in unemployment. The review of each type of study is organised around three main themes: a) Present descriptive evidence on regional variation in unemployment; b) Analysis of the causes of inter-regional variation in unemployment; and c) Implications for aggregate equilibrium unemployment and for policy making.

a. State-level

Descriptive information on rates of unemployment by state in Australia relative to the national average rate is presented in Figures 2a and 2b for the period from 1978 onwards. It is apparent that state differentials have been relatively small with rates for all states for the most part remaining within a one percentage points band around the national average. Unemployment rates in Victoria, NSW, Queensland and WA have fluctuated around the national average (with the largest fluctuations occurring for Victoria); whereas in Tasmania and SA rates of unemployment have remained persistently above the national average over the past two decades.

Figure 2a: Rate of Unemployment by State - Difference from Rate of Unemployment for Australia - Persons - 1978 to 1999 (August)

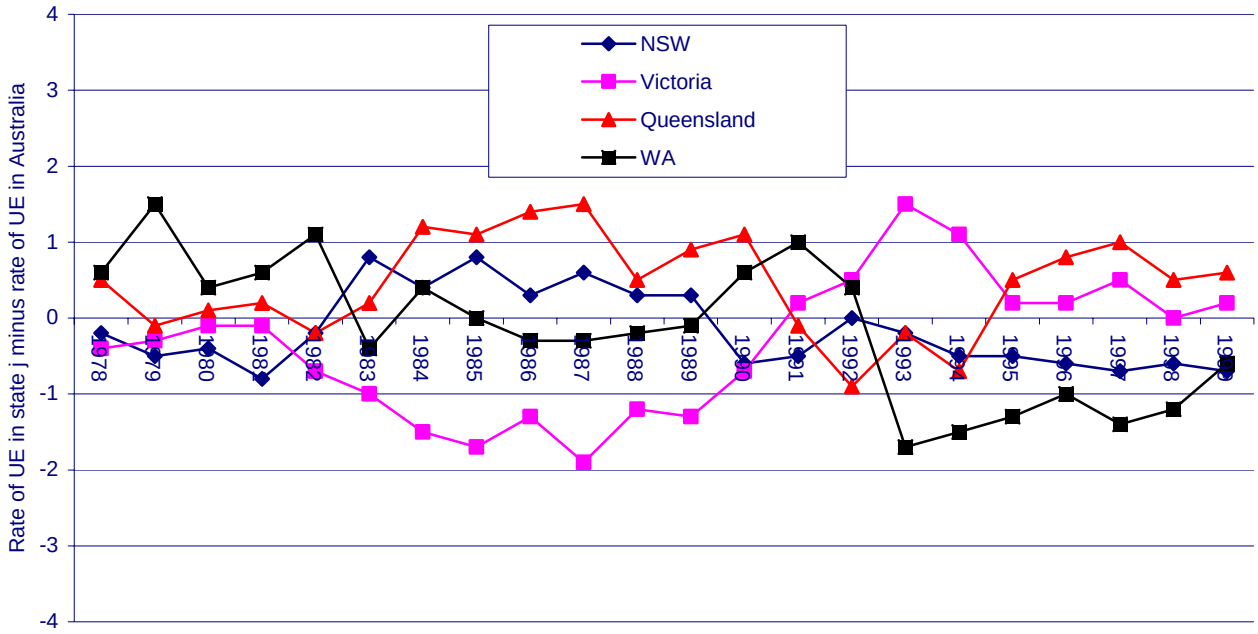
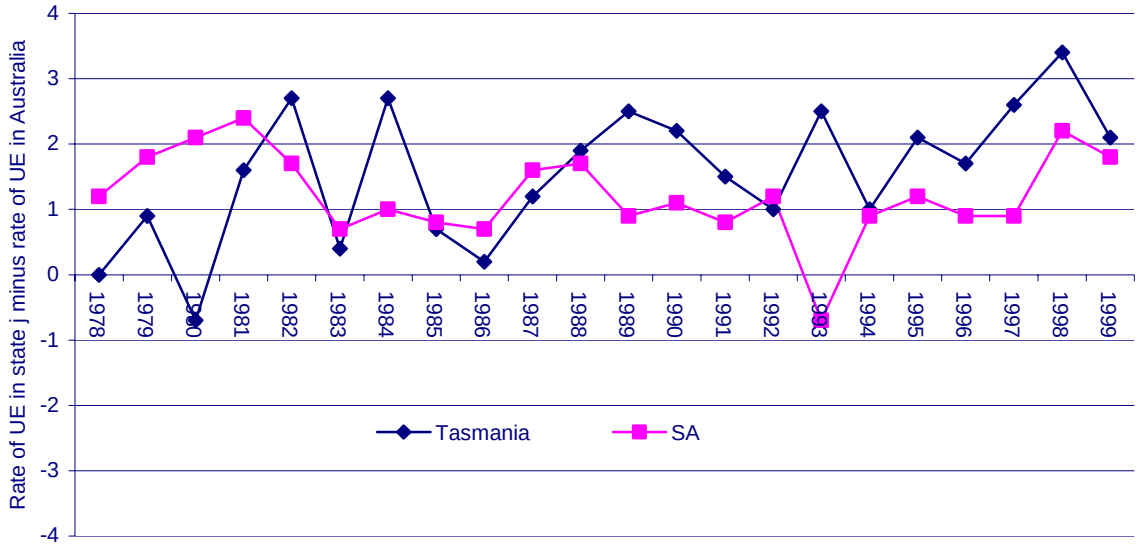


Figure 2b: Rate of Unemployment by State - Difference from Rate of Unemployment for Australia - Persons - 1978 to 1999 (August)



To understand the sources of state-level differences in rates of unemployment two main types of empirical method have been applied. One approach has been to examine the relation between state-level rates of unemployment and the national rate. The rationale for this exercise is to understand the extent to which state-level variation in unemployment is determined by national influences (for example, Groenewold, 1991, and Debelle and Vickery, 1999). A second approach has been to estimate multi-equation (structural or VAR) models using time-series data disaggregated by state to examine the determinants of, for example, rate of unemployment, participation rate, average wages, employment rate, and inter-state labour mobility (for example, Industry Commission, 1993, Groenewold and Hagger, 1995, Groenewold, 1997, and Debelle and Vickery, 1999). The main application of this approach has been to study the adjustment process by which state level labour markets adjust to demand and supply shocks that have different impacts across states. (For example, to assess the extent to which state labour markets respond to an adverse shock to employment through lower wages, a decrease in labour force participation, a permanent change in employment, or out-migration to other states.)

Studies that regress state level rates of unemployment on the rate for Australia generally find that most of the movement in state unemployment rates can be explained by

variation in the national rate. For example, Debelle and Vickery (1999) find that the coefficient of determination between national and state unemployment rates varies between 0.75 and 0.90.

Recently however this approach has been criticised by Dixon and Shepherd (2000). They argue that, first, a high correlation between movements in the unemployment rate series could be consistent with differences in the mean rates of unemployment between states; and second, that the construction of the national rate, as a weighted average of state rates of unemployment, may cause estimates of the relation between state and national rates of unemployment to be biased.

Dixon and Shepherd (2000) instead apply cointegration techniques to test for common trends and common cycles in state-level rates of unemployment. They find that – first, there is no evidence of common trends in state unemployment rates; and second, for the five largest states there is a common cycle but Tasmania, ACT and NT do not share a common cycle. The existence of relatively permanent state-level differences in rates of unemployment is argued to imply that there may be a role for targeted regional policies to decrease the aggregate equilibrium rate of unemployment.

Whether there is a role for targeted regional policies as a means of improving efficiency would however seem to depend on the sources of permanent differences in state-level rates of unemployment. For example, where individuals are not constrained in their decisions on where to reside, and inter-state differences in unemployment rates are compensated for by differences in amenity of living environments, there may be no role for regional type policies. In seeking to understand differences in unemployment rates by state Dixon and Shepherd (2000) point to the differences in industry structure, but more work on this issue would seem to be required.

Multi-equation modelling of the determinants of state-level rates of unemployment has adopted a variety of estimation techniques – the main contrast being between use of a structural model (for example, Groenewold, 1997) and a reduced form (VAR) model (for example, Debelle and Vickery, 1999).

Each of these multi-equation studies finds that there are relatively permanent (or highly persistent) inter-state differences in rates of unemployment. Where there are differences

is in the findings on adjustment to state-specific shocks. First, there are differences in the time lag for the rate of unemployment to shift back to its base level following a shock to employment. For example, in response to a 1 per cent decrease in state-level employment Debelle and Vickery (1999) find that the rate of unemployment would take about 4 years to be restored to its base level; whereas Groenewold (1997) and Industry Commission (1993) conclude that adjustment would take over 10 years. Second, in terms of how adjustment occurs all studies find that wage adjustment plays a relatively minor role in the adjustment process; some difference exists however in conclusions on the relative importance of decreases to labour force participation and out-migration – whereas Debelle and Vickery (1999) find that inter-state labour mobility is more important than decreases in labour force participation, the opposite result was obtained by the Industry Commission (1993).

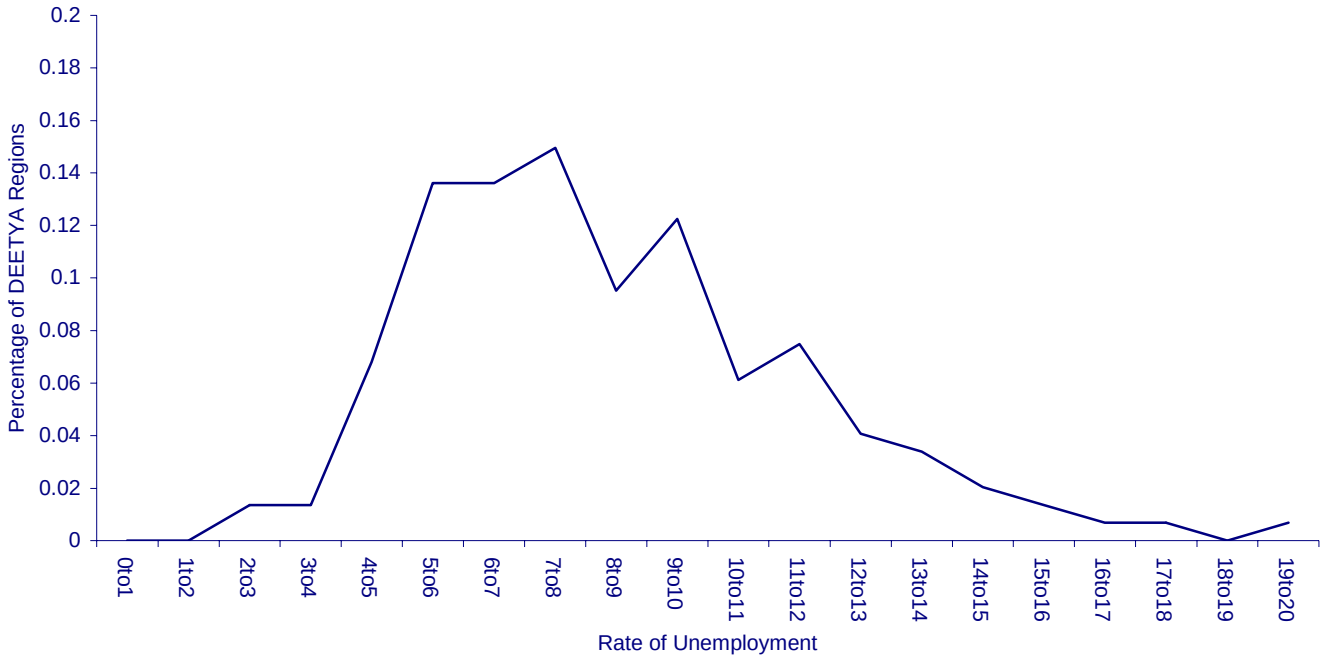
To the extent that state-level shocks are an important source of labour market fluctuations, evidence of relatively slow adjustment to those shocks may reveal one cause of persistently high aggregate rates of unemployment in Australia. It could then be argued that a potential policy response to high unemployment would be policies to improve inter-state adjustment. For example, it has been suggested that inter-state mobility could be increased through reductions in disincentives to mobility such as stamp duty on home purchases, or by improving information on labour market opportunities; another possibility would be to allow greater scope for wages to adjust to regional demand and supply conditions. (However, the role for such policies is conditional on state-level shocks being an important source of labour market fluctuations. The evidence in Dixon and Shepherd, 2000, that suggests a common cycle between the largest states, would seem to indicate otherwise.)

b. Intra-state-level

A number of studies have documented dispersion in the rate of unemployment between neighbourhoods. Figure 2c for example shows considerable dispersion between rates of unemployment for DEETYA labour market regions in 1996. It is apparent from the Figure that dispersion in rates of unemployment is far higher at this level of region than at the state level. (Borland, 1997, p.396 reports that less than 10 per cent of the overall

variation in rates of unemployment between DEETYA regions can be explained by between-state variation.)

Figure 2c: Distribution of Rates of Unemployment by DEETYA Regions - Australia - June 1996



Other studies have used alternative definitions of a region, and have also studied changes across time in the extent of dispersion of unemployment. Gregory and Hunter (1995) show that in 1976 unemployment rates for Census Collector Districts (CDs) ranged from about 2 per cent to 7 per cent; by 1991 dispersion had increased substantially with minimum and maximum unemployment rates of about 5 per cent and 37 per cent. Andrews and Karmel (1993) also present evidence of considerable variation in rates of unemployment between Statistical Local Areas (SLAs) in each year from 1984 to 1991. The cyclical sensitivity of the rate of unemployment is found to differ between SLAs with low and high rates of unemployment. Neighbourhoods with relatively low rates of unemployment display less cyclical sensitivity to changes in the aggregate rate of unemployment. As well, although the rate of unemployment in each SLA converges to the national average rate of unemployment, the speed of convergence is inversely related to the rate of economic growth. Even at the higher level of aggregation of ABS Labour Force Regions, Stubbin and Hart (1990) find persistent dispersion in rates of unemployment in each year between 1984 and 1990.

A starting point for understanding the sources of inequality in the distribution of unemployment between neighbourhoods to examine how much of that variation can be explained by differences in the average characteristics of the residents in those neighbourhoods. Karmel et al. (1993) examined differences in the rate of unemployment between SLAs in 1986 and found that over 70 per cent of the variation in unemployment rates between metropolitan regions can be explained by differences in population characteristics such as educational attainment. Hunter (1995b) has examined the sources of the difference in average employment/population rates between the bottom decile of CDs and CDs above the bottom decile ranked by socioeconomic status. It is found that two-thirds of the difference can be explained by differences in the average characteristics of individuals living in those neighbourhoods - in particular by differences in average educational attainment. The remaining one-third of the difference in average employment/population rates is due to differences between neighbourhoods in the coefficients on characteristics – that is, differences in the probability of employment for a given set of characteristics.

Analyses of changes in regional dispersion in rates of unemployment also find that differences in characteristics between regions are relatively important for understanding those changes. First, Hunter (1995a) has shown that changes in the industrial mix of employment have been an important determinant of changes in employment outcomes in CDs at all levels of socioeconomic status; the most pronounced effect of structural factors was in the period between 1981 and 1986 which coincides with large decreases in manufacturing industry employment during the 1982-82 recession. Second, changes in the effect of educational attainment on the probability of employment also appear to have an effect on inter-neighbourhood differences in employment/population rates. In particular, the sensitivity of the neighbourhood employment/population rate to differences in the proportion of neighbourhood population with a degree increased between 1976 and 1991. Since lower socioeconomic status CDs have lower average levels of educational attainment, a stronger effect of education on employment outcomes causes a reduction in relative employment/population rates in low socioeconomic status CDs (Gregory and Hunter, 1995).

An important issue for policy making (similar to in the analysis of inter-state unemployment rate differentials) is the extent to which intra-state regional differences in rates of unemployment are due to regional factors, and hence need to be addressed with policies that have an explicit regional dimension. Another way of putting this issue is to ask – to what extent does regional variation in rates of unemployment exert an independent influence on the equilibrium rate of unemployment?

There appear to be two main ways in which regional dispersion in rates of unemployment might have a direct effect on the aggregate equilibrium rate of unemployment, and hence indicate a potential role for regional policies. One is where the regional distribution of unemployment is a component of structural unemployment – that is, part of a long-run imbalance between labour demand and labour supply. A second is where there are intra-region spillovers or external effects so that the region in which individuals live can determine their employment outcomes and hence also affect the evolution of aggregate unemployment.

On the first type of regional effect - structural mismatch - several studies have examined 'spatial mismatch' at the intra-state level. To the extent that spatial mismatch exists it might be possible for government policy to reduce equilibrium unemployment through, for example, policies to subsidise travel. However, the evidence on spatial mismatch is mixed. A common finding is that employment and unemployment outcomes in a neighbourhood do not appear to be strongly related to variables such as a neighbourhood's distance from the central business district (Vipond, 1980, Beed et al., 1983, and Hunter, 1995c); one other study, though, has concluded that distance from central business district and public transport availability are significant determinants of inter-neighbourhood variation in the rate of unemployment (Karmel et al., 1993).

The second potential regional effect – intra-regional spillovers – could be manifested in a variety of ways (for reviews see Durlauf, 1994, and Borland, 1995). A first source is where the quality of local public goods such as schooling depends on the average level of income of residents in a region, and hence there is likely to be a spillover effect from average income to the level and quality of education acquired by students in that region. A second source occurs where the composition of a neighbourhood causes 'supply effects' on education or employment outcomes in that neighbourhood. For example,

where education levels or occupations chosen by individuals in a neighbourhood have been limited to a subset of possible choices, the absence of precise information on likely outcomes from other choices may effectively restrict the choice set of an individual in that neighbourhood who must decide on a level of educational attainment or choose an occupation. For example, where no individuals in a neighbourhood have attended university, the absence of information on returns to a university degree may cause other individuals in that neighbourhood to exclude the option of attending university. A third source occurs where the composition of a neighbourhood has 'demand effects' on employment outcomes. That is, even if individuals in different regions make the same estimate of the return to employment, in those regions where relatively fewer persons are employed there may be less information about available job opportunities. Hence, new jobs may be rationed between regions on the basis of average employment/population rate in each region. A fourth source is where individuals' behaviour is affected by the behaviour of their peers in the same neighbourhood. For example, where individuals derive satisfaction from behaving in a similar manner to their peers it is possible that 'herd' behaviour in educational attainment will develop within neighbourhoods.

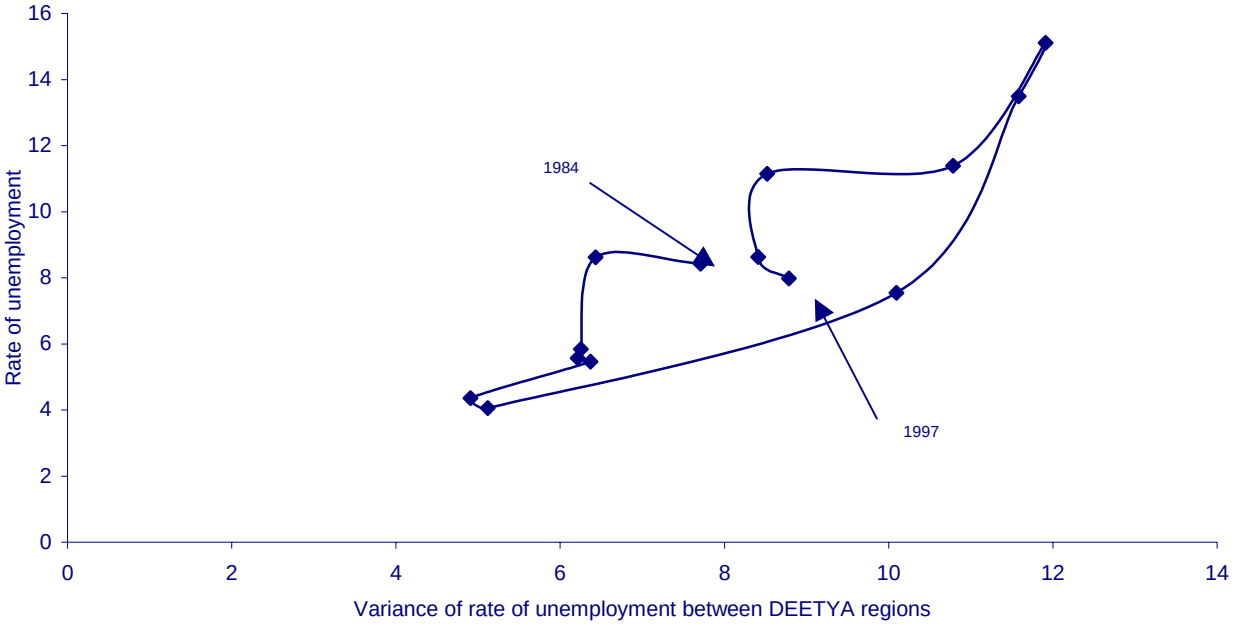
Where intra-region spillover effects exist then a person's region of residence will be an important independent determinant of employment outcomes. Moreover, the regional distribution of unemployment can affect the aggregate equilibrium rate of unemployment. For example, suppose that there is an adverse shock to labour demand that decreases employment and increases unemployment in a region (and therefore increases aggregate unemployment). After a time the shock to labour demand is reversed. Assume however that the efficiency in job search of unemployed persons is positively related to the proportion of persons in their region in employment. The initial adverse shock to labour demand will have therefore reduced the search efficiency of unemployed persons in that region; hence an increase in the equilibrium rate of unemployment would occur. The same effect will occur in an aggregate multi-region model where, for example, initially one-half the regions are affected by positive demand shocks and the other half by negative demand shocks, and those shocks are subsequently reversed, provided that the marginal effect on search efficiency of unemployment is increasing (in absolute value) with the rate of unemployment. In this

scenario an increase in regional dispersion in rates of unemployment could over the long run (after the shocks are reversed) be associated with a higher equilibrium rate of unemployment.

What evidence is available on the existence of intra-regional spillovers in Australia? The main evidence seems to be in two papers by Heath and Overman (1998) and Heath (2000). In the first paper the relation between individual's decisions on whether to complete high school and neighbourhood effects are studied using data from the Australian Youth Survey for 1991. Some evidence for the role of local supply-side effects is found. Specifically, it is found that the probability of an individual completing high school is inversely related to the proportion of the population in the CD where that individual resides with vocation qualifications. This may represent some effect due to limits on information available on returns to completing high school. In the second paper job search methods of unemployed persons are examined using data on job searchers aged 16-19 years from the Australian Youth Survey in 1991. It is found that the higher the rate of unemployment in the CD in which an individual resides the lower is the probability that the individual's main job search method would be through direct contacts. This appears to offer direct support for a regional spillover effect whereby the job search efficiency of individuals differs between regions for reasons related to the employment/population rate in the region.

Some indirect evidence on the independent effect of regional factors on aggregate equilibrium unemployment is also available. Figure 2d presents data on dispersion in rates of unemployment between DEETYA labour market regions and the aggregate rate of unemployment between 1984 and 1997. Borland and Kennedy (1998, pp. 90-91) argue that the absence of an outward shift in the relation between those series implies that changes in aggregate search efficiency due to greater dispersion in inter-regional rates of unemployment do not seem to have been a cause of higher equilibrium unemployment in Australia. However, the data does not extend over the period from the mid 1970s to early 1980s which other studies (for example, Gregory and Hunter, 1995) have found to be the main period of increases in dispersion in intra-state rates of unemployment and was also the period where the most significant increases in the equilibrium rate of unemployment in Australia seem to have occurred.

Figure 2d: Average Rate of Unemployment and Regional Dispersion in Rates of Unemployment - DEETYA Local Labour Markets - Persons - Victoria - 1984 to 1997 (June)



Where regional effects have an independent influence on the aggregate equilibrium rate of unemployment this may provide a role for regional policy. At present there is some evidence to support the existence of such effects; however, the evidence is not extensive and is somewhat mixed. It is also important to note that appropriate regional policy would probably require a detailed knowledge of the exact type(s) of spillover(s) that affect outcomes in regional labour markets (for example, effects on education attainment or on job search would require different policy responses). Hence much more detailed empirical research on spillovers would be required than currently exists.

4. Unemployment duration

This section reviews evidence on the distribution of duration of unemployment spells. Four main tasks are undertaken: a) Present descriptive evidence on unemployment duration; b) Review studies of aggregate time-series properties of long-term unemployment; c) Review studies of determinants of duration of unemployment spells; and d) Review evidence on government policy and duration of unemployment.

a. Descriptive evidence

Tables 3 and 4, and Figures 3a and 3b, present descriptive information on the distribution of the duration of unemployment spells in Australia. Table 3 shows that during the 1990s, at any point in time there have been large proportions of unemployed persons with relatively short spells and relatively long spells of unemployment. For example, the proportion of unemployed with spells of less than 3 months is between 30 and 40 per cent, and the proportion of long-term unemployed (with spells of more than 52 weeks) is between 25 and 35 per cent. Although the shares in each duration category are relatively stable over time, two points about time-series variation are worth noting. First, as the aggregate rate of unemployment has increased since the late 1970s, the proportion of very long-term unemployed (104 weeks +) has grown. Second, in periods where the rate of unemployment increases the proportion of long-term unemployed initially decreases and then increases again (with opposite movements in the proportion of short-term unemployed).

Table 3: Unemployed persons by duration of current spell – Australia – 1978 to 1999 (August)

	0-4 weeks	4-13 weeks	13-52 weeks	52-104 weeks	104 weeks+	Rate of UE
1978	0.205	0.259	0.367	0.114	0.053	6.5
1979	0.202	0.255	0.362	0.117	0.062	6.1
1980	0.197	0.256	0.340	0.111	0.093	6.2
1981	0.197	0.273	0.316	0.104	0.108	5.8
1982	0.209	0.270	0.330	0.095	0.094	7.0
1983	0.119	0.204	0.400	0.152	0.122	10.2
1984	0.150	0.203	0.333	0.159	0.152	8.8
1985	0.164	0.183	0.342	0.125	0.183	8.2
1986	0.173	0.209	0.341	0.113	0.161	8.3
1987	0.167	0.205	0.341	0.126	0.158	8.1
1988	0.177	0.206	0.332	0.117	0.166	7.1
1989	0.217	0.240	0.311	0.091	0.138	6.0
1990	0.186	0.259	0.337	0.096	0.120	7.2
1991	0.132	0.211	0.408	0.146	0.101	9.8
1992	0.113	0.167	0.375	0.195	0.148	10.9
1993	0.123	0.178	0.334	0.169	0.193	11.1
1994	0.120	0.182	0.333	0.157	0.206	9.5
1995	0.146	0.202	0.342	0.126	0.181	8.4
1996	0.167	0.223	0.324	0.129	0.155	8.8
1997	0.154	0.204	0.333	0.137	0.169	8.7
1998	0.157	0.194	0.311	0.145	0.191	8.1
1999	0.185	0.218	0.303	0.119	0.173	7.1

The cyclical dimension of long-term unemployment is also evident in Figures 3a and 3b that show the rate of unemployment and rate of long-term unemployment/or proportion of long-term unemployed. (Figure 3b defines 13+ weeks as long-term unemployment in order to derive a long-term unemployment series that extends over a longer time period.) It is evident that long-term unemployment follows movements in total unemployment with some lag – hence the 'loop' relation between the rates of unemployment and long-term unemployment in Figure 3a. One important point from these Figures is that whereas Figure 3a, using data from 1978 onwards, shows no large change in the proportion of long-term unemployed, such a change is evident in the mid-1970s in Figure 3b using data from the mid-1960s onwards.

The cyclical dimension of long-term unemployment is also evident in Figures 3a and 3b that show the rate of unemployment and rate of long-term unemployment/or proportion of long-term unemployed. (Figure 3b defines 13+ weeks as long-term unemployment in order to derive a long-term unemployment series that extends over a longer time period.) It is evident that long-term unemployment follows movements in total unemployment with some lag – hence the 'loop' relation between the rates of unemployment and long-term unemployment in Figure 3a. One important point from these Figures is that whereas Figure 3a, using data from 1978 onwards, shows no large change in the proportion of long-term unemployed, such a change is evident in the mid-1970s in Figure 3b using data from the mid-1960s onwards.

Table 4: The distribution of long-term unemployment - Civilian population aged 15 years and over - Australia – February 2000

	Rate of UE	Percentage of Labour Force	Percentage of LT Unemployed
1. Age			
15-19	19.0	8.7	10.2
20-24	10.9	11.9	16.3
25-34	7.3	24.5	24.1
35-44	5.6	25.0	39.9
45-54	4.4	21.2	
55-64	5.1	8.7	9.5
2. Occupation			
Manager/administrator	0.8	7.1	0.9
Professional	1.8	17.8	9.2
Associate Professional	2.5	11.3	7.8
Tradespersons	3.4	13.5	14.4
Advanced clerical/service	1.7	4.5	2.1
Intermediate clerical/sales/service	3.0	17.0	10.8
Intermediate production/transport workers	4.2	8.9	9.0
Elementary clerical/sales/service	3.9	9.8	13.8
Labourers and related workers	6.8	10.1	32.0
3. Industry			
Agriculture	3.4	5.4	4.5
Manufacturing	4.3	13.6	23.7
Construction	4.2	8.4	9.9
Wholesale Trade	2.7	5.8	3.6
Retail Trade	3.2	16.2	18.9
Accommodation etc.	5.2	5.3	10.2
Transport/storage	2.7	4.8	2.4
Business and property services	3.3	11.9	8.7
Government administration	2.7	4.2	6.0
Education	2.0	6.9	1.8
Health and community services	1.6	10.1	1.5
Recreation services	2.2	2.7	3.0
Personal services	2.4	4.7	3.3

Notes: Unemployment rates by education are for the civilian population aged 15 to 64 years and for May 1998. Labour force and unemployment by occupation and industry include as employed all persons employed in the respective occupation or industry at the time of the survey, and as unemployed all persons who were unemployed at the time of the survey, who had worked for at least two weeks full-time in the previous two years and whose last job was in the respective industry or occupation.

Not all groups are affected equally (or in proportion to their share of the total labour force) by long-term unemployment. Table 4 shows that prime-age workers (35-54 years), workers in low skill occupation groups and working in manufacturing or accommodation etc. industries are disproportionately affected. (For further evidence on the incidence of long-term unemployment, see Junankar and Kapuscinski, 1991.)

Figure 3a: Rate of Unemployment and Rate of Long-Term Unemployment - Australia - Civilian Population Aged 15 Years and Over - 1978/qtr1 to 2000/qtr1 (Seasonally Adjusted)

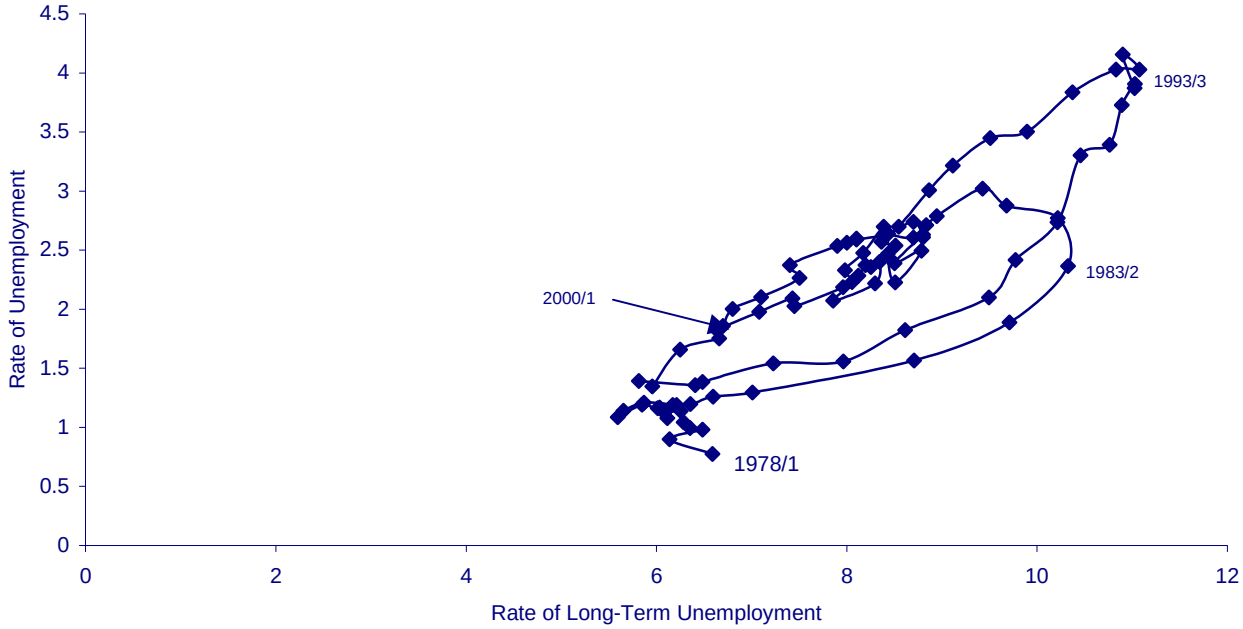
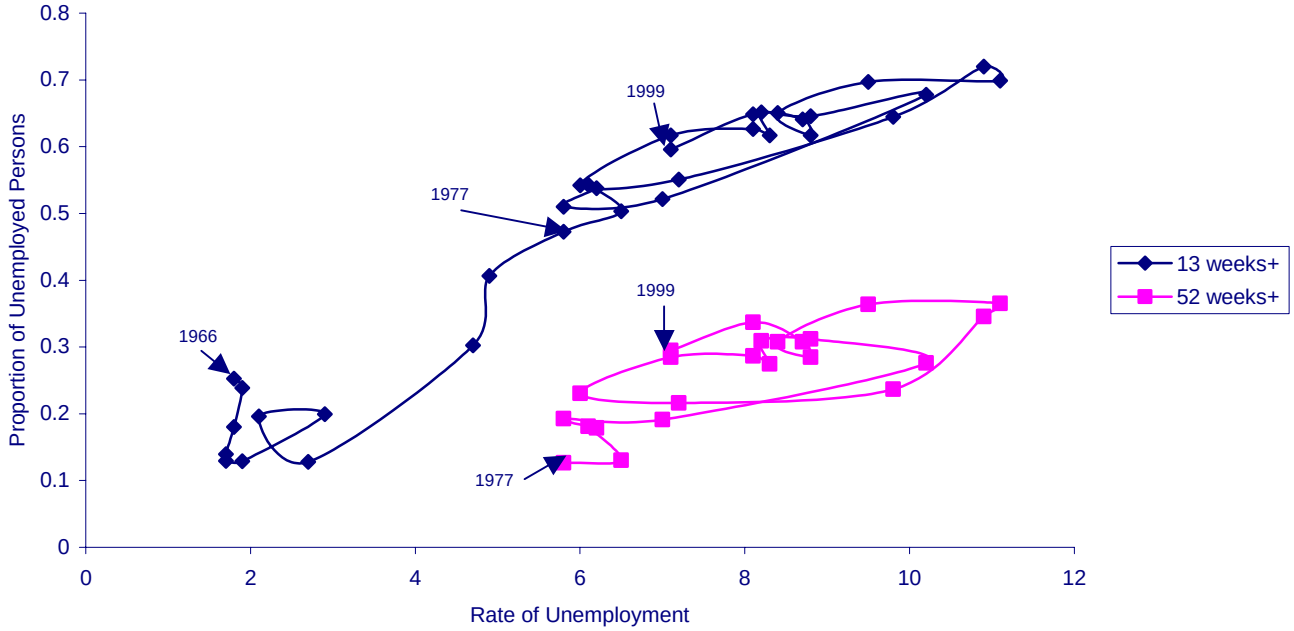


Figure 3b: Rate of Unemployment and Distribution of Duration of Unemployment - Australia - Civilian Population Aged 15 Years and Over - 1966 to 1999(August)



b. Time-series analysis of long-term unemployment

One group of studies has been primarily concerned with seeking to understand the determinants of long-term unemployment (or rate of long-term unemployment) in Australia.(The main examples are Trivedi and Hui, 1987, Flatau et al., 1991, Chapman et al., 1992, EPAC, 1996, and Junankar and Kapuscinski, 1998.) These studies have applied time-series regression techniques to ABS Labour Force Survey data for a variety of periods from the late 1970s to the 1990s.

Probably the main finding from these studies has been the primary role of total unemployment (or the total rate of unemployment) in explaining variation in long-term unemployment (or the rate of long-term unemployment). Consistent with the data displayed in Figure 3a, a model that specifies long-term unemployment as a function of lagged total unemployment performs well in explaining long-term unemployment.

Some studies have also investigated the effect of other variables on long-term unemployment. Trivedi and Hui (1987) test a wide range of variables as potential explanation for the proportion of long-term unemployed for disaggregated male/female adult/youth groups. They find evidence of significant relations between the proportion of long-term unemployment and the real level of unemployment benefits (positive); demand-side influences proxied for by real factor productivity and vacancy rates (negative); and real wages (positive effect of own real wage, and negative effect of real wages of other groups). Junankar and Kapuscinski (1998) attempt to test for the role of Working Nation by comparing forecasts of employment and long-term unemployment between 1994/2 and 1996/4 with actual outcomes. They do not find strong evidence that Working Nation was associated with a reduction in long-term unemployment through improved aggregate employment outcomes.

One other issue that has been addressed in time-series analyses of long-term unemployment is whether there has been a structural break in the relation between total unemployment and long-term unemployment. This issue is important as, for example, an increase in long-term unemployment relative to total unemployment could be a source of decreasing search efficiency amongst the pool of unemployed, and hence

provide an explanation for hysteresis or persistence in the equilibrium rate of unemployment.

Most studies that have addressed this issue conclude that there has in fact been no change in the relation between total unemployment and long-term unemployment (for example, McDonald, 1993, EPAC, 1996, and Borland and Kennedy, 1998). This is consistent with what other authors have found for a range of European countries (see Machin and Manning, 1999). However, it is important to note that these studies use data from the late 1970s onwards. Interestingly, the only opposite evidence is from Flatau et al. (1991) who apply quarterly data from 1967/3 to 1990/1 to test for the existence of a cointegrating relation between total unemployment and long-term unemployment. They find that there is no tendency for the proportion of long-term unemployment to converge to an equilibrium. This raises the issue of whether a structural break occurred in the relation between long-term unemployment and total unemployment prior to the late 1970s. Figure 3b appears to suggest that this may have been the case, showing a large increase in the proportion of persons with unemployment spells of more than 13 weeks during the mid-1970s.

c. Determinants of the duration of unemployment spells

Studies of the determinants of duration of unemployment spells for Australia are reviewed in Table 5. Several alternative methodologies have been applied to examine the determinants of the duration of unemployment spells. The main approach has been to examine the determinants of the end of an unemployment spell – using this type of approach some studies have adopted an explicit hazard function methodology, whereas other studies have used simpler estimation methods to examine the determinants of whether a transition from unemployment to another labour force state occurs (or the average probability of transition). Both aggregate-level and individual-level data have been applied in these studies. The other estimation approach has been to examine the determinants of the duration of unemployment spells.

Some common themes emerge from these studies on the determinants of the duration of unemployment spells. First, there appears to be fairly strong evidence that the probability of an unemployment spell ending does not depend on the duration of the

spell. Although some studies have found evidence of negative duration dependence, it is important to note that those studies do not control for unobserved heterogeneity. (And in the absence of such controls a negative relation between the probability of exiting unemployment and duration of spell could be caused either by 'true' state dependence or by selection effects whereby the average unobserved quality of a cohort of unemployed persons whose spell began at the same time becomes worse as the duration of the spell increases.) With appropriate controls for unobserved heterogeneity there does not appear to be a strong relation between spell duration and the probability of exiting unemployment (for example, Hui, 1986, Chapman and Smith, 1992, and Stromback et al., 1998).

Second, a range of personal and labour market related characteristics appear to be related to the duration of unemployment spells. First, several studies find that the duration of unemployment spells is increasing with age, and decreasing with level of education attainment. Second, time-varying demand side factors, proxied for by the vacancy rate or rate of unemployment, appear to affect unemployment spell duration. Third, previous labour market experience tends to have a negative effect on the duration of unemployment spells. Fifth, persons who are married, and particularly those who have a spouse working, appear to have shorter unemployment spells. Finally, there is some evidence that unemployment spell duration is related to job search methods – that persons whose primary method of job search is through friends/relatives have shorter spells than persons who use the CES or newspapers.

Table 5: Studies of unemployment duration

Study	Time period	Type of study	Data	Findings
Gregory and Paterson (1980)	1967/1 to 1978/2 (quarterly)	Determinants of expected average duration of ue spells	Aggregate - DSS – Benefit recipients	Average duration of ue spells related to: a) Replacement rate (+); b) Vacancy rate (-); and c) Share of manufacturing employment (-).
Trivedi and Kapuscinski (1985)	1970/2 to 1980/3 (Quarterly)	Determinants of average exit rate from unemployment	Aggregate – a) ABS – Gross flows data; and a) DSS – Benefit recipients.	Average probability of exit from ue related to: a) Vacancy rate (-); b) Real ue benefit rate (+); c) Index of capacity utilisation (-); and d) Real wages (+/-)
Brooks and Volker (1986)	March to June 1984	Hazard rate (Exit from ue to emp)	Aggregate – ABS – Gross flows	Probability of exit from ue to emp related to: a) Duration of spell (-); and b) Gender (female > male);
Hui (1986)	September 1983 – 1984	Hazard rate (Exit from ue to emp) (Control for unobserved heterogeneity)	Individual -Australian Longitudinal Youth Survey (Persons aged 15 to 25 in 1984)	Probability of exit from ue to emp related to: a) Duration of spell (+/zero); b) Age (-); c) Education attainment (+); and d) Job experience (+)
Miller and Volker (1987)	September 1984-1985	Hazard rate (Exit from ue); and ii)	Individual -Australian Longitudinal Youth Survey (Persons aged 15 to 26 in 1985)	Probability of exit from ue to emp related to: a) Duration of spell (-); b) Education attainment (+); c) Use CES/newspapers to find job (-); d) Participation in labour market program (+)
Trivedi and Hui (1987)	March to April 1984 (Monthly)	Hazard rate (Exit from ue to emp)	ABS – Gross flows	Probability of exit from ue to emp related to: a) Duration of spell (-); b) Age (-); and c) Female*married (-).
Chapman and Smith (1992)	1985 to 1988 (Annual)	Hazard rate (Exit from ue to emp) (Control for unobserved heterogeneity)	Individual – Australian Longitudinal Youth Survey (Persons aged 15-26 in 1985)	Probability of exit from ue to emp related to: a) Education attainment (+); b) Region of residence (city > rural); c) Age (+); d) Reservation wage (-). No significant relation with duration of spell.

Hardin and Kapuscinski (1997)	1985 to 1991	Determinants of transition from ue to emp	Individual – Australian Longitudinal Youth Survey; and Australian Youth Survey (Persons aged 16-28 in survey period)	Determinants of transition from ue to emp: a) Married (+); b) Disability (-); c) Education attainment (+); d) Proportion of previous year in ue (-); and e) Rate of ue by state/year (-).
Kapuscinski (1997)	i) 1980/2 to 1990/2 (Quarterly) ii) 5 2-month panels from 1986, 1987, 1989, and 1991.	i) Determinants of average probability of exit from ue; and ii) Determinants of transition from from ue to emp	i) Aggregate – DSS – Benefit recipients; and ii) Individual – ABS – Labour Force Survey	i) Determinants of average probability of exit from ue: a) Proportion of long-term ue (+); and b) Real ue benefits (+). ii) Determinants of transition from ue to emp: a) Duration of ue spell (-); b) (Males) Last job in manufacturing industry/tradesperson (-); and c) (Females) Married (+).
Stromback et al. (1998)	September 1994 – 1995	i) Determinants of transition from ue to emp; ii) Hazard rate (Exit from ue to emp) (Control for unobserved heterogeneity)	Individual – ABS - SEUP	i) Determinants of transition from ue to emp: a) Age (-); b) Level of govt benefits (-); c) Spouse working full-time (+); and d) Participation in training and wage subsidy program (+). No significant relation with duration of spell. ii) Probability of exit from ue related to: a) Duration of spell (-); b) Age (-); c) Education attainment (+); d) Spouse working full-time (+); and e) Labour market program participation (-).
Heath and Swann (1999)	Period prior to September 1996	Determinants of duration of ue spell	Individual – ABS - SEUP	Determinants of duration of ue spell: a) Education (-); b) Age (+); c) Last job temporary (-); d) Last job in manufacturing (+); e) Last job as manager (+); f) Ue benefit eligibility (+); g) Housing costs (-).
Chalmers and Kalb (2000)	April/June 1995 to September 1997	Hazard rate (Exit from ue to emp) (Control for unobserved heterogeneity)	Individual – ABS - SEUP	Probability of exit from ue to permanent emp higher for persons who initially move from ue to casual emp. Probability of exit from ue to emp not related to duration of ue spell.

Third, studies of the determinants of the duration of unemployment spells have also examined the role of policy variables. Several studies examine the role of unemployment benefits. These studies tend to find that variables for unemployment benefit eligibility or the real level of unemployment benefits are positively related to spell duration; however one study (Kapuscinski, 1997) does find that spell duration is inversely related to the real level of unemployment benefits. Some studies have also examined participation in labour market programs. These studies arrive at mixed conclusions on the effect of program participation on unemployment spell duration. In most cases the studies do not appear to put much weight on these findings, concluding that they are probably primarily due to selection effects (that is, the program participation variables are proxying for unobserved characteristics of the types of persons selected to participate).

d. Role for policy?

What rationale might exist for policy intervention designed to affect the distribution of duration of unemployment spells? The main efficiency rationale for intervention appears to be in order to improve search efficiency. For example, it has been argued that an increase in the aggregate rate of unemployment that is associated with a rise in the proportion of long-term unemployed may decrease average search efficiency of the pool of unemployed persons. Such a decrease in search efficiency could constitute a source of hysteresis in aggregate unemployment. In this situation there could be a role for policy intervention to seek alter the distribution of unemployment spell durations in order to improve search efficiency of the unemployed. The other rationale for policy intervention is of course equity concerns; that it may be seen as desirable to ‘share’ the burden of unemployment more evenly by reducing the proportion of unemployed with long-term spells.

What evidence exists that might support a role for policy intervention to affect the distribution of unemployment spell durations? Time-series studies of long-term unemployment (reviewed above) do provide some evidence a structural increase in the proportion of long-term unemployed during the 1970s. Hence, this might be taken to indicate that a source of hysteresis in the aggregate rate of unemployment (or the increase in the equilibrium rate of unemployment) during the 1970s was a reduction in

search efficiency associated with a change in the composition of the pool of unemployed persons. Where this argument however appears to fall down is in the idea that a change in the composition of the pool of unemployed persons will affect search efficiency. Studies of the determinants of the duration of unemployment spells, which show that there is no significant relation between the probability of exiting from unemployment and elapsed spell duration, would suggest the opposite. In this case policy intervention to affect the distribution of unemployment spell durations would have no affect on overall search efficiency. (An important point to note about the studies of the determinants of unemployment spell durations is however that one reason why the studies do not find a relation between exit probability and spell duration may be that labour market policies operating in the periods covered by those studies were in fact acting to reduce the labour market disadvantage of the long-term unemployed. That is, the studies may confound 'true' duration dependence with policy effects.)

The second important issue regarding policy intervention is what types of policies might be applied to alter the distribution of duration of unemployment spells. One possibility would be to alter unemployment benefit payments. Reductions in eligibility, time limits on period of payment, or reductions in the level of benefits relative to potential labour market earnings, might all be expected to improve search incentives of unemployed persons, and hence to reduce the average duration of unemployment spells. A shortcoming of existing research is that while it provides some evidence that unemployment benefits are a significant determinant of search behaviour, it does not provide much basis for deciding on the relative impact on search behaviour the possible types of adjustments that might be made to unemployment benefit payments. A second possible policy intervention to change the distribution of duration of unemployment spells would be through labour market programs (for example, Working Nation that sought to reduce the proportion of unemployed persons in the 18+ months category). Existing studies of the determinants of the duration of unemployment spells (reviewed above) do not however provide a strong basis for assessing the relation between labour market program participation and unemployment spell duration. As Webster (1998) notes this appears to be a weakness of the Australian literature on evaluation of labour market programs.

References

Andrews, L. and Karmel, T. (1993), 'Dynamic aspects of unemployment', pp.45-105 in T. Karmel, B. McHugh, A. Pawsey and C. Evans (eds.) *Regional Labour Market Disadvantage,* AGPS, Canberra.

Beed, C., Singell, L. and Wyatt, R. (1983), 'The dynamics of intra-city unemployment patterns', *Australian Bulletin of Labour*, 10, December, 36-46.

Borland, J. (1995), 'Employment and income in Australia – Does the neighbourhood dimension matter?', *Australian Bulletin of Labour*, 21, 281-293.

Borland, J. (1996), 'Education and the structure of earnings in Australia', *Economic Record*, 72, 370-380.

Borland, J. (1997), 'Unemployment in Australia – Prospects and policies: An overview', *Australian Economic Review*, 30, 391-404.

Borland, J. (1999), 'Will lowering wages create more jobs?', *CEDA Bulletin*, July, 18-19.

Borland, J. and S. Kennedy (1998), 'Earnings inequality in Australia in the 1980s and 1990s', Discussion paper no.389, Centre for Economic Policy Research, Australian National University.

Borland, J. and G. Woodbridge (1999), 'Wage regulation, low-wage workers, and employment', pages 86-121 in S. Richardson (ed.) *Reshaping the Labour Market* (Melbourne, Cambridge University Press).

Brooks, C. and P. Volker (1986), 'The probability of leaving unemployment: The influence of duration, destination and demographics', *Economic Record*, 62, 296-309.

Card, D., F. Kramarz and T. Lemiuex (1996), 'Changes in the relative structure of wages and employment: A comparison of the United States, Canada and France', Working Paper no.5487, National Bureau of Economic Research.

Chalmers, J. and G. Kalb (2000), 'Are casual jobs a freeway to permanent employment?', mimeo.

Chapman, B., R. Junankar and C. Kapuscinski (1992), 'Projections of long-term unemployment', *Australian Bulletin of Labour*, 18, 195-207.

Chapman, B. and P. Smith (1992), 'Predicting the long-term unemployed: A primer for the CES', pages 263-281 in R. Gregory and T. Karmel (eds.) *Youth in the Eighties* (Canberra, DEET and CEPR, ANU).

Daly, A., D. Nguyen-Hong, D. Eldridge, O. Gabbitas and P. McCalman (1998), *Youth Wages and Employment* (Canberra, Productivity Commission).

Davis, D. (1998), 'Does European unemployment prop up American wages? National labor markets and global trade', *American Economic Review*, 88, 478-494.

Debelle, G. and J. Vickery (1999), 'Labour market adjustment: Evidence on interstate labour mobility', *Australian Economic Review*, 32, 249-263.

Dixon, R. and D. Shepherd (2000), 'Trends and cycles in Australian state and territory unemployment rates', Research paper no.730, Department of Economics, University of Melbourne.

Dunlop. Y (2000), *Labour Market Outcomes of Low Paid Adult Workers*, catalogue no.6293.0.00.005 (Canberra, Australian Bureau of Statistics).

Durlauf, S. (1994), 'Spillovers, stratification and inequality', *European Economic Review*, 38, 836-845.

Economic Planning and Advisory Commission (1996) *Future Labour Market Issues for Australia* (Canberra, AGPS).

Flatau, P., P. Lewis and A. Rushton (1991), 'The macroeconomic consequences of long-term unemployment', *Australian Economic Review*, 24, 4th quarter, 48-56.

Foster, W. and R. Gregory (1982), 'The contribution of employment separation to teenage unemployment', *Economic Record*, 58, 118-133.

Gregory, R. (1996), 'Wage deregulation, low paid workers and full employment', pages 81-101 in P. Sheehan, B. Grewal and M. Kumnick (eds.) *Dialogues on Australia's Future* (Melbourne, Victoria University).

Gregory, R. and Hunter, B. (1995), 'The macro economy and the growth of ghettos and urban poverty in Australia', Discussion Paper no.325, Centre for Economic Policy Research, Australian National University.

Gregory, R. and P. Paterson (1980), 'The impact of unemployment benefit payments on the level and composition of unemployment in Australia', Discussion Paper no.11, Centre for Economic Policy Research, ANU.

Groenewold, N. (1991), 'Regional unemployment disparities and cyclical sensitivities: Some Australian results', *Australian Journal of Regional Studies*, 6, 15-28.

Groenewold, N. (1997), 'Does migration equalise regional unemployment rates? Evidence from Australia', *Papers in Regional Science*, 76, 1-20.

Groenewold, N. and A. Hagger (1995), 'Regional unemployment dynamics: The big neighbour effect', *Australasian Journal of Regional Studies*, 1, 197-214.

Harding, A. and C. Kapuscinski (1997), 'Young Australians in unemployment: Despair by any other name', Discussion Paper no.359, Centre for Economic Policy Research, ANU.

Harris, M. (1996), 'Modelling the probability of youth unemployment in Australia', *Economic Record*, 72, 118-129.

Heath, A. (2000), 'Youth Education Decisions and Job Search Behaviour in Australia', unpublished Ph.D dissertation, London School of Economics.

Heath, A. and H. Overman (1998), 'The influence of neighbourhood effects on education decisions in a nationally funded system: The case of Australia', Paper presented at Ph.D Conference in Economics and Business, ANU.

Heath, A. and T. Swann (1999), 'Reservation wages and the duration of unemployment', Research Discussion Paper 1999-02, Reserve Bank of Australia.

Hui, W. (1986), 'State dependence and youth unemployment in Australia: A survival analysis', Working Papers in Economics and Econometrics no.138, ANU.

Hunter, B. (1995a), 'The social structure of the Australian urban labour market: 1976-1991', *Australian Economic Review*, no.2, 65-79.

Hunter, B. (1995b), 'Explaining changes in the social structure of employment: The importance of geography', Paper presented to the 24th Conference of Economists, University of Adelaide.

Hunter, B. (1995c) 'Changes in the geographic dispersion of urban employment', unpublished Ph.D thesis, Australian National University.

Industry Commission (1993), *Impediments to Regional Industry Adjustment* (Canberra, AGPS).

Jackman, R., R. Layard, M. Manacorda and B. Petrongolo (1997), 'European versus US unemployment: Different responses to increased demand for skill?', Discussion Paper no.349, Centre for Economic Performance, London School of Economics.

Juhn, C., K. Murphy and R. Topel (1991), 'Why has the natural rate increased over time?', *Brookings Papers on Economic Activity*, no.2, 75-142.

Junankar, R. and C. Kapuscinski (1991), 'The incidence of long-term unemployment in Australia', Discussion Paper no.249, Centre for Economic Policy Research. ANU.

Junankar, R. and C. Kapuscinski (1998), 'Was working nation working?', *Journal of Industrial Relations*, 40, 25-40.

Kapuscinski, C. (1997), 'The future of the unemployed in Australia: A comparative analysis of time-series and cross sectional evidence on exits from unemployment', mimeo, ANU.

Karmel, T., McHugh, B. and Pawsey, A. (1993) 'People or places?', pp.11-43 in T. Karmel, B. McHugh, A. Pawsey and C. Evans (eds.) *Regional Labour Market Disadvantage*, AGPS, Canberra.

Katz, L. and D. Autor (1999), 'Changes in the wage structure and earnings inequality', pages 1463-1555 in O. Ashenfelter and D. Card (eds.) *Handbook of Labor Economics* Volume 3A (Amsterdam, North Holland).

Le, A. and P. Miller (2000), 'Australia's unemployment problem', *Economic Record*, 76, 74-104.

Lewis, P. (1985), 'Substitution between young and adult workers in Australia', *Australian Economic Papers*, 24, 115-126.

McCormack, D. (1993), 'Youth in the Australian Labour Market', unpublished Ph.D thesis, Latrobe University.

McDonald, I. (1993), 'Long-term unemployment and macroeconomic policy', *Australian Economic Review*, no.2, 31-34.

Machin, S. and A. Manning (1999), 'The causes and consequences of long-term unemployment in Europe', in O. Ashenfelter and D. Card (eds) *Handbook of Labor Economics* Volume 3C (Amsterdam, North Holland), pages 3085-3139.

Mangan, J. and J. Johnston (1997), 'Minimum wages, training wages and youth employment', Discussion Paper no.229, Department of Economics, University of Queensland.

Merrilees, W. (1979), 'Teenage unemployment: The role of wage rates and other factors', Paper presented to 49th ANZAAS Conference, Auckland.

Merrilees, W. (1984), 'Do wage subsidies stimulate training? An evaluation of the craft rebate scheme', *Australian Economic Papers*, 23, 235-248.

Miller, P. and L. Neo (1997), 'Immigrant unemployment: The Australian experience', *International Migration*, 35, 155-183.

Miller, P. and P. Volker (1987), 'The youth labour market in Australia: A survey of issues and evidence', Discussion Paper no.171, Centre for Economic Policy Research, ANU.

Nickell, S. and B. Bell (1995), 'The collapse in demand for the unskilled and unemployment across the OECD', *Oxford Review of Economic Policy*, 1, 40-62.

Nickell, S. and B. Bell (1996), 'Changes in the distribution of wages and unemployment in OECD countries', *American Economic Review Papers and Proceedings*, 86, 302-308.

Pappas, N. (1998), 'Changes in the demand for skilled labour in Australia', mimeo, Centre for Strategic Economic Studies, Victoria University of Technology.

Preston, A. (1997), 'Where are we now with human capital theory in Australia?', *Economic Record*, 73, 51-78.

Stromback, T., M. Dockery and W. Ying (1998), 'Transitions in the labour market: Evidence from the Survey of Employment and Unemployment Patterns', Working Paper 1/98, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Stubbin, T. and Hart, D. (1990), 'Measuring regional labour market disadvantage', pp.257-280 in M. Gordon and B. Gordon (eds.) *Regional Modelling and Regional Planning*, Institute of Industrial Economics, University of Newcastle.

Trivedi, P. and W. Hui (1987), 'An empirical study of long-term unemployment in Australia', *Journal of Labor Economics*, 5, 20-42.

Trivedi, P. and C. Kapuscinski (1985), 'Determinants of inflow into unemployment and the probability of leaving unemployment: A disaggregated analysis', pages 151-185 in P. Volker (ed.) *The Structure and Duration of Unemployment in Australia* (Canberra, AGPS).

Vella, F. and K. Mackay (1986), 'The determinants of take-up of SYETP wage subsidies for youth', *Journal of Industrial Relations*, 28, 211-224.

Vickery, J. (1999), ‘Unemployment and skills in Australia’, Research Discussion Paper no.1999-12, Reserve Bank of Australia.

Vipond, J. (1980), ‘Intra-urban unemployment differentials in Sydney, 1971’, *Urban Studies*, 17, June, 131-138.

Webster, E. (1998), ‘Microeconomic evaluations of Australian labour market programs’, *Australian Economic Review*, 31, 189-201.