

AN EXPLORATION OF MARGINAL ATTACHMENT TO THE AUSTRALIAN LABOUR MARKET

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Abstract

One of the key factors that affects the extent to which changes in labour demand affect other macroeconomic variables, such as wage inflation, is the degree of matching between potential employees and available jobs. The pool of potential employees is usually measured as the pool of unemployed workers. However, this ignores an important group of people who are not officially unemployed, but do represent potential labour supply – the marginally attached workforce, which can be broadly defined as the people who are not currently in the labour force, but want to work and are available to take up employment.

The aim of this paper is to examine the extent to which the labour market behaviour of marginally attached workers is similar to that of the unemployed. We use longitudinal data from the Survey of Employment and Unemployment Patterns (SEUP), which provides detailed information on the characteristics of individuals as well as their labour market experiences, to compare dynamic behaviour across labour market groups, for example, the probability of moving into employment. We find that in some respects the dynamic behaviour of the marginally attached is similar to that of the unemployed, but in others it is quite different. Accordingly, the most appropriate measure of labour supply depends on the policy question, and consequently a range of measures should be considered.

JEL Classification Numbers: J21, J22, J64

Keywords: dynamic behaviour, effective labour supply, marginal attachment, transition probability, unemployment

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1. Introduction

One of the key factors that affects the extent to which changes in labour demand affect other macroeconomic variables, such as wage inflation, is the degree of matching between potential employees and available jobs. The pool of potential employees is usually measured as the pool of unemployed workers. However, this ignores an important group of people who are not officially unemployed, but who represent potential labour supply – the marginally attached workforce. This workforce can be defined broadly as the people who are not currently in the labour force, but want to work and are available to take up employment. For example, seasonal workers can be counted as marginally attached in the off-season if the only reason they are not looking for work is the intermittent nature of employment opportunities in their local labour market. Another important group of marginally attached people is discouraged workers who want a job and are currently available for work but have given up actively searching for work because they believe they cannot find work.

The extent to which the marginally attached contribute to the effective labour supply in the economy depends upon the extent to which the labour market behaviour of the marginally attached workers is similar to that of the unemployed. To date, there is no Australian research on the average length of time spent as a marginally attached worker, or on the transitions between marginal attachment and other labour force states (such as employment and unemployment). This paper seeks to redress this gap in the literature.

The main source of information about marginally attached workers is the Labour Force Survey (LFS) conducted by the Australian Bureau of Statistics (ABS). This data source provides us with information about the stock of marginally attached workers. However, this survey only provides a limited amount of information on the labour market dynamics of marginally attached workers, which is the focus of

this paper. To this end, longitudinal data on the Australian population from the Survey of Employment and Unemployment Patterns (SEUP) are used. In particular, multivariate regression techniques are used to estimate the determinants of the labour force transitions of the unemployed and the marginally attached.

The rest of the paper is organised as follows. Section 2 reviews what we know about marginally attached workers from previous research. In Section 3 we discuss the SEUP data, various definitions of labour force status and consider the representativeness of the data. In Section 4 we use the longitudinal nature of the data to analyse the labour market dynamics of the employed, unemployed, marginally attached and other not-in-the-labour-force (NILF) groups. Section 5 considers the factors affecting these labour force transitions in a regression framework. The final section of the paper reflects on the policy implications of the results.

2. Literature Review

2.1 Defining Marginal Attachment and Discouraged Workers

Using the official ABS definitions (ABS 2000), a person is classified as being unemployed if they are not employed, want to work, are actively searching for work and are available to start work. Persons not in the labour force who want to work are classified as being marginally attached to the labour force if they are actively looking for work but not available to start work in the reference week, or are not actively looking for work but are available to start work within four weeks.

An important subset of the marginally attached group are discouraged workers who are defined by the International Labour Organisation (ILO) as persons who want a job and are currently available for work but have given up actively searching for work because they believe they cannot find work (Husmanns, Mehran and Verma 1990). The main reasons given by discouraged workers for not actively searching include that: the state of the market is so poor that there are few jobs available, an individual's qualifications or skills do not match those required in available jobs, or employers want younger employees. While the official ILO definition excludes people who give personal reasons for not looking for work, the

ILO recognises that it may be difficult to draw a clear distinction, as respondents may not be able to abstract their personal circumstances from the labour market situation.

There are arguments both for and against treating marginally attached workers as unemployed and therefore as participating in the labour market (Husmanns *et al* 1990). The extent to which the marginally attached should be treated the same as the unemployed depends, to a large degree, on the extent to which they re-enter the workforce over time. One argument for their inclusion in the labour force is that such people are willing and, in many cases, available for work. It is also argued that discouraged workers might be expected to behave similarly to the unemployed during an economic recovery and, thus, to be particularly likely to re-enter the core labour force.

The argument against the classification of the marginally attached and discouraged workers as unemployed relates to measurement problems. While unemployment depends on objective criteria, discouragement is a more subjective definition (Finnegan 1981). It should also be recognised that there is a subjective component of what constitutes *active* job search.

The relative merits of such arguments can only be evaluated in the context of specific studies of how the labour force attachment of marginally attached and discouraged workers compares to that of the unemployed. While there is some international evidence that discouraged workers have no more tendency to re-enter the workforce during periods of economic recovery than others who are not in the labour force, the Australian data have not been empirically tested (Flaim 1984; Husmanns *et al* 1990).

2.2 A Brief Introduction to the Literature

The discouraged worker concept has a long history in labour economics. Empirical studies of the relationship between the labour force participation rate and the unemployment rate date back to the 1940s. Woytinsky (1940) developed the ‘additional worker theory’, which suggests that the participation rate should increase during recessions because there would be an influx of ‘fringe’ potential

workers into the labour market. This occurs because of their need to supplement family income following unemployment of the ‘breadwinner’.

In contrast, Humphrey (1940) and Long (1958) argued that unemployed workers become discouraged during a recession due to the diminished likelihood of finding employment and consequently exit the job market. This phenomenon was labelled the ‘discouraged worker effect’. This theory suggests that the labour force participation rate should decrease during recessions because looking for work has such a low expected pay-off for these people that they decide spending time at home is more productive than spending time in job search.

McConnell and Brue (1992) argue that the discouraged worker effect should outweigh the additional worker effect because the discouraged worker effect applies to many more households. For example, if the household unemployment rate rises from, say, 6 to 9 per cent, only those 3 per cent or so of all families who now contain an additional unemployed member will be subject to the additional worker effect. On the other hand, worsening labour market conditions may have a discouraging effect upon both the actual and potential labour force participants in all households.

While the pioneering literature into marginal attachment and discouraged workers was largely empirical, it needs to be placed in a theoretical framework to facilitate analysis and interpretation. One suitable framework is the search theoretic framework, which relates individual optimising labour supply behaviour to the macroeconomic cycle, and defines two reservation wages. The first is the labour supply reservation wage. This is the wage rate below which the person would not accept a job. The second is the search reservation wage, below which the person will not search for work, even if they are willing and available to work. If there are search costs, then the search reservation wage will be greater than the labour supply reservation wage. In this framework, a marginally attached worker will be any individual who wishes to work at the current wage, but does not engage in active search because the expected costs of job search outweigh the expected benefits (Blundell, Ham and Meghir 1998).¹ For these individuals, a fall in the

¹ This definition can be extended to the case in which a person does not wish to work in this period but may want to work in the future if their circumstances changed or if wages are higher in future time periods.

costs of job search or an increase in the probability of success from job search would mean that they would be more likely to start actively searching for employment.

The empirical literature on the relationship between aggregate unemployment and labour force participation rates has emphasised the role of business cycle factors in determining labour demand, and therefore the costs and benefits of searching for work. Local labour market conditions will also affect the level of labour demand and so have a role in explaining the labour market dynamics of the marginally attached. Personal characteristics that affect the demand for an individual's labour, such as skill levels, will be important. The probability of being a discouraged worker or marginally attached will also be affected by any other factors, such as family composition, that influence the utility of non-participation and the costs of the search, which can be considerable and include both the time, monetary and psychological costs of rejection.

2.3 Overview of Empirical Studies

Empirical studies can be classified into two groups: aggregate time series evidence and microeconomic evidence, which is often based on cross-sectional data. Despite McConnell and Brue's (1992) intuitively appealing argument that the discouraged worker effect will dominate the additional worker effect, the empirical analysis of aggregate time series data has been mixed. For example, Benati (2001) concludes that US research is inconclusive. That is, while a number of US studies find that labour force participation rates have no cyclical variation, other studies find that there is either a mild or strong discouraged worker effect. However, the evidence from other countries is more clear with the discouraged worker effect tending to prevail over the additional worker effect (Gregg 1994; Tachibanaki and Sakurai 1991).

The aggregate time series data for Australia also show that there is a strong discouraged worker effect. For example, Lenten finds:

...when Australia heads towards recession, as approximately 100 people become unemployed, approximately 37 additional people exit the workforce in the long-run through discouragement, thus leading to a pronounced understatement of the real unemployment rate. (Lenten 2001, p 16)

Other Australian literature has tended to focus on providing detailed summaries of unemployment, discouragement and other marginal attachment for various socio-demographic groups (Stricker and Sheehan 1981; Wooden 1996). These studies find that the degree of labour force discouragement is generally higher for females than for males, especially women with children under 15 years of age, and for unmarried people than for married. Also, people born in Australia are more easily discouraged than their foreign-born counterparts, as are secondary and tertiary students compared to non-students. By region, it is found that there is a greater incidence of discouraged workers in high unemployment regions.

The main limitation of aggregate time series studies and cross-sectional studies is that it is not possible to understand an individual's labour force dynamics. Few of the existing studies use longitudinal data to investigate whether the labour market dynamics of discouraged workers have more in common with the behaviour of the unemployed than the behaviour of those who do not wish to work. Using US data for the period 1983–86, Martini (1988) finds that the average duration of a completed spell of 'discouragement' is short – less than three months – and that 75 per cent of completed spells of discouragement end in a spell of job search or in employment.

The analysis in this paper is most closely related to Jones and Riddell (1999), who use longitudinal data from the Canadian Labour Force Survey to examine the movements of individuals between labour market states. These data allow them to separate marginally attached and discouraged workers from other individuals who are not in the labour force. They find that the dynamic behaviour of the marginally attached is quite different to both the unemployed and the rest of the NILF and consequently that the stated desire to work is an important characteristic.

3. Data and Definitions

3.1 The Survey of Employment and Unemployment Patterns (SEUP)

The SEUP is a longitudinal survey conducted by the ABS covering the period September 1994 to September 1997. Respondents were individuals aged 15 to 59, living in private dwellings in both rural and urban areas of Australia and were selected into the sample between May and July 1995. Data for the survey were collected in three waves of interviews.

The survey comprised three sub-samples. The largest sub-sample comprised 5 488 persons who were job seekers (the JS sub-sample). Members of this group were identified as being either unemployed, underemployed or marginally attached to the labour market. The underemployed included persons who were working part-time but who stated their desire to work more hours. Persons who were studying full-time and desired a part-time job were not included in this sample. A second smaller sub-sample, the Population Reference Group (PRG), was selected to be representative of the Australian population and comprised 2 311 persons. The third sub-sample was of people known to have participated in a labour market program. However, the data file released to the public excludes the labour market program information and this group cannot be separately identified.

At each interview, two levels of information were collected. First, data were collected about the respondent at the time of the interview. This information includes details on current demographic and social characteristics of the respondents such as gender, age, educational qualifications, family structures, place of residence, weekly income, hours of work and annual income for the previous financial year from various sources. In addition to current labour force status, information was also collected about selected characteristics of job(s) if a respondent was employed at the time of the interview. At each interview, respondents were also asked about the labour market experience of other family members such as their spouse and/or their parents.

The second type of data collected was episodal information relating to each respondent's experiences in the labour market over the previous 12 months or so. These data provide information on each spell of work, each period of looking for

work and each period spent out of the labour market. Using these data it is possible to construct continuous labour market histories of employment, unemployment, marginal attachment and other time spent not in the labour force (other NILF) for the entire period of the survey (September 1994 to September 1997). Given the focus of this study is on the labour market dynamics of the marginally attached and the unemployed, most of the analysis in the rest of the paper is based upon measures of labour force status constructed using the episode data.²

Table 1 presents information on sample sizes for the JS and PRG samples at each of the three interviews (waves). As with all longitudinal surveys, there is sample attrition. Over the entire survey 19.3 per cent of the sample was lost, with 11.7 per cent being lost between waves 1 and 2 and 8.6 per cent being lost between waves 2 and 3. There are some differences in the rates of attrition between different groups. Young males have higher attrition rates than do young females or older respondents. Renters have higher attrition rates than do non-renters. There are also differences in rates of attrition between married respondents and those who are not married. See ABS (1995) for more information about the patterns of attrition in the survey.

Table 1: Sample Sizes at Each Interview

	Wave 1	Wave 2	Wave 3
Sub-sample			
PRG sample	2 311	2 120	1 983
JS sample	5 488	4 779	4 261
Total sample	7 799	6 899	6 244

Notes: There is some overlap between the PRG and JS sub-samples. In the first wave, 227 persons were members of both samples. Wave 1 covered the period 1 September 1994 to 31 August 1995, wave 2 the period 1 September 1995 to 31 August 1996 and wave 3 the period 1 September 1996 to 31 August 1997.

The period of time covered by the SEUP was one of considerable fluctuation in the rate of growth of employment. Between September 1994 and September 1995 employment growth was quite strong at 3.1 per cent. The rate of growth of employment for the rest of the survey period was much lower at 0.9 and 1.1 per cent in the year to the wave 2 and 3 interviews respectively. Given the prominence attached to the level of labour demand conditions in models of the

² For more information on the SEUP, see ABS (1997, 1998).

determinants of labour force status, the variation in macroeconomic conditions should increase the power of the analysis.

Survey weights are available for each wave in the SEUP, and these can be used to generate the relevant population estimates. The survey weights are based on independently estimated distributions of various respondent characteristics in the general and the job seeker populations. They also account for sample design and attrition in the survey.

Since it is not possible to combine the JS and PRG weights in any simple manner, it is important to consider whether it is valid to combine the respective samples.³ This depends upon the purposes for which the data are being used. The convention in economic studies is that unweighted data can be used for inferences about underlying behavioural patterns, but weighted estimates are required before the results can be interpreted as providing population estimates. In Sections 3 and 4, the JS and PRG samples are analysed separately using weighted data, and consequently the results can be interpreted as population estimates. In contrast, Section 5 combines the JS and PRG samples without weighting in order to analyse the factors underlying the dynamic behaviour of the marginally attached and the unemployed.

3.2 Definitions of Labour Force Status

Information on labour force status is available from the interview data or from the episode data. The analysis of the labour force dynamics presented in this paper is based upon labour force histories constructed using the episode data as they allow a complete labour force history to be constructed, and allow marginally attached workers to be identified.⁴ The interview data are only used for the purposes of assessing the representativeness of the SEUP data.

The information about each episode is based upon retrospective questions at the time of each annual interview. While the questions asked are similar to the

³ See ABS (1995) for further information about the weighting procedure.

⁴ Although the original survey gathers the information to allow the official definition of marginal attachment to be derived, critical pieces of information are not included in the publicly released data set.

standard ABS questions, the fact that they are retrospective may introduce some distortions.⁵ Using the episode data, employment episodes are defined as periods of time in which the respondent had one or more paid jobs. Unemployment episodes are defined as periods of time in which the respondent was actively searching for work and was not employed. This differs slightly from the standard ABS definition which also includes an ‘availability to start work’ test. It is not possible to include the availability criterion since the information was not collected for job search episodes.

Marginally attached episodes are defined as episodes in which the respondent is not actively searching for work but is willing and available to start work.⁶ Using this definition, there were 449 respondents who were marginally attached at the approximate date of the wave 1 interview.⁷ As outlined above, a subset of the marginally attached are discouraged workers, who can be identified as marginally attached respondents who give labour demand reasons for not actively searching for employment.⁸ The number of discouraged workers at the approximate date of the wave 1 interview is 163, and falls to 106 if the main reason for not searching is related to labour demand. Although discouraged workers are an important subset of the marginally attached, the numbers of discouraged workers in the SEUP sample are too small to allow a reliable analysis, and the remainder of this paper focuses on the more general concept of marginal attachment.

⁵ If recall bias is significant, individuals may make systematic errors when asked about their past labour force experiences. On balance it appears that retrospective measures of labour force experience result in fewer spells of unemployment being reported than would be reported from contemporaneous surveys (Akerlof and Yellen 1985; Levine 1993).

⁶ This excludes a small number of respondents who were actively looking for work but were not available to start work within four weeks and who are marginally attached according to the official definitions. It is not possible to separately identify this group using the public release data set. However, the numbers of respondents in the category will be small. In September 2000, this group made up only 2.2 per cent of the overall marginally attached workforce (ABS 2000).

⁷ The interview date is not available in the public release data set. For all respondents, the wave 1 interview is assumed to be 1 September 1995.

⁸ The labour demand reasons for not looking for work include: considered too young or too old by employers; lacks necessary schooling, training, skills or experience; difficulties with language or ethnic background; no jobs in locality or line of work; no jobs with suitable hours; and no jobs at all.

3.3 Representativeness of the SEUP Data

Before proceeding to the analysis of the dynamics of labour force status it is important to establish the representativeness of the SEUP data and any biases which may be introduced by the use of the episode data. These may arise either from the retrospective nature of the data or subtle differences in the questions asked. This section compares the estimates of labour force status constructed using SEUP's episode data and interview data with estimates from the ABS's Labour Force Survey (LFS). As discussed, the PRG was selected to be representative of the general population whereas the JS sample is representative of job seekers. Given the very different nature of the population represented by the PRG and JS samples, the representativeness of the two samples are considered separately.

Table 2 shows the distribution of labour force status defined using standard ABS definitions at the wave 1 interviews. The first column presents the weighted estimates made using the JS sample and the second column the weighted estimates made using the PRG sample. At the time of the wave 1 interview, 74 per cent of the PRG sample were employed, 6.5 per cent were unemployed and 19.5 per cent were NILF. Breaking down the NILF category, the weighted estimates suggest that 0.6 per cent of the population are discouraged workers, 1 per cent wanted to work but were not actively looking for work because they were in education, and 0.9 per cent wanted to work but were unavailable to start work. These estimates are broadly consistent with those from the LFS (ABS 2000, 2001).

Table 2: Labour Force Status at First Interview: Standard ABS Definitions

	Per cent	
	JS sample	PRG sample
Employed	36.8	74.0
Unemployed	45.0	6.5
NILF	18.2	19.5
Discouraged worker	1.8	0.6
Wanted to work but in education	3.0	1.0
Wanted to work but unavailable to start work	1.9	0.9
Sample size (unweighted)	5 488	2 311

Note: The numbers reported in the table are weighted estimates for the labour force status of the JS and PRG samples.

As expected, the distribution of labour force status in the JS sample is very different. The proportion of the weighted sample that is unemployed is 45 per cent, compared to 6.5 per cent of the PRG. This simply reflects the different populations. While the proportion of marginally attached groups is roughly three times higher in the JS sample, the distribution over the different types of marginal attachment is similar to estimates from the PRG. For example, the largest category in both cases is 'Wanted to work but in education' and there are roughly twice as many in this category as there are discouraged workers.

Table 2 provides information on the representativeness of the sample at a point in time. Given the focus of this study on the labour dynamics of the marginally attached and the unemployed, it is important to also consider whether the labour market dynamics of the SEUP sample are representative. One-month transition probabilities estimated from the SEUP can be benchmarked against the LFS gross flows data. The gross flows data do not separately identify the marginally attached and so for the purposes of benchmarking, the marginally attached identified in the SEUP data are recombined with other NILF. The labour force transition probabilities from the SEUP are estimated separately for the PRG and the JS samples. These one-month labour force transition probabilities are presented in Appendix A.

As already discussed, the samples were selected between May and June 1995, and exact interview dates are not available. We have chosen 1 June 1995, the midpoint of this period, as the starting date for calculating the transition probabilities on the basis that episodes current at this date are most likely to be representative of the JS and PRG samples. This also maximises the sample size.

Since the PRG sample is representative of the entire population, the lack of information on the interview date presents no difficulty. The patterns and size of labour force transitions estimated from the PRG sample are broadly similar to those obtained from the gross flows data. The major difference is that the estimated probability of remaining in unemployment after one month is higher in the SEUP sample than is estimated from the LFS gross flows data. This is mainly a result of the SEUP data having a lower transition rate from unemployment to NILF. This is consistent with the broader definition of unemployment used in the SEUP episode data.

The timing issue is more significant for the JS sample. At the chosen date, all episodes should either be of unemployment, underemployment or marginal attachment owing to the design of the JS sample. Another consequence of the sample design is that most episodes of employment and other NILF occurring at 1 June 1995 are not likely to be representative of those experienced by the general population. For this reason, the transitions from employment and other NILF for the JS sample are not presented in Appendix A, and these individuals are not included in the rest of the analysis. Unsurprisingly, the probability of unemployed individuals in the JS sample remaining unemployed after one month is also higher than that estimated from the LFS gross flows data, but there is not a statistically significant difference in this transition probability between the PRG and JS samples.

4. The Dynamics of Unemployment and Marginal Attachment

This section compares the labour market dynamics of the unemployed and marginally attached with the dynamics of the employed and other NILF. As discussed above, the behaviour of the employed and other NILF categories is only estimated using weighted labour market outcomes for individuals who were in the PRG sample. The behaviour of the unemployed and marginally attached workers is estimated using weighted information about individuals in the JS sample. Although the individuals in the PRG sample who were unemployed or marginally attached workers in June 1995 will also be representative of these groups, the sample sizes are small, and as it is not possible to combine the JS and PRG weights, these individuals have not been included.

4.1 Distribution of the Number of Episodes of Each Labour Force State

One way of describing the labour market dynamics is to examine the distribution of the number of episodes spent in each labour force state across respondents. This information is presented in Table 3. The analysis is restricted to respondents who were still in the sample at the time of the final (wave 3) interview, and had experienced at least one of the relevant labour market episodes. Note that it is conceptually difficult to identify the number of employment episodes because

respondents may hold several jobs at the one time and consequently such estimates are omitted from Table 3.

Amongst the respondents who experienced at least one episode of unemployment, the average number of episodes was 1.67. This is higher than the average of 1.33 episodes of other NILF and 1.27 episodes of marginal attachment. The distribution of unemployment episodes is relatively dispersed – 55.5 per cent of respondents experienced only one episode, 28.5 per cent experienced two episodes and 11.6 per cent had experienced three episodes of unemployment.

Table 3: Distribution of Number of Episodes by Labour Force State
Per cent

Number of episodes	Unemployed	Marginally attached	Other NILF
One	55.5	78.1	78.1
Two	28.5	17.5	13.2
Three	11.6	3.8	6.9
Four	2.7	0.5	1.0
Five	1.1	0.1	0.6
Six or more	0.6	0.0	0.2
Average number of episodes	1.67	1.27	1.33

Note: The sample includes all individuals that were present at the end of the survey period, and weights that account for sample attrition.

Overall the distribution of the number of episodes spent in other NILF is similar to that for marginal attachment. This similarity is not surprising given that neither the marginally attached nor other NILF are actively looking for employment and therefore are less likely to have an episode interrupted by employment. The tendency for there to be fewer episodes of marginal attachment compared to unemployment episodes indicates that there may be differences in the labour market dynamics of the unemployed and the marginally attached.

4.2 Labour Market Transitions

Transition probabilities are often used to describe labour market dynamics by presenting the extent to which the reported labour force status of individuals changes over time. A transition probability matrix identifies the extent and path of movement between various labour market states of individuals from one time

period to another. Four labour market status categories are examined – employed, unemployed, marginally attached and other NILF.

Table 4 presents the transition probability matrix for the 3, 12 and 24-month periods. Each row in the table relates to the labour market status of individuals at June 1995 and each column is their labour force status 3, 12, or 24 months on. The interpretation of the cells in the table is best described with an example. Reading across the first row, the figure in the column titled ‘Employment’ indicates that, of all individuals who were employed in June 1995, 97.2 per cent were employed three months on. The figure in the next column suggests that 1.3 per cent of those employed in June 1995 were unemployed three months on. The column titled ‘Marginally attached’ indicates that 0.1 per cent of the employed in June 1995 were marginally attached three months on. The final column indicates that 1.4 per cent of those employed on 1 June 1995 were other NILF three months on.

We can test whether the probability of remaining in the initial labour force state differs between the unemployed and marginally attached by asking whether the point estimate of one transition lies within the 95 per cent confidence interval of the other. In other words, the estimate of 70 per cent for the probability of remaining unemployed after three months is not significantly different, statistically speaking, from the estimate of 68.3 per cent for the marginally attached, because it lies within the 95 per cent confidence interval 61.9 to 74.7 per cent. Therefore, we can conclude that in the short-run (three months), marginal attachment and unemployment are equally stable labour force states.

Table 4: Transaction Probabilities between Labour Force States

From 1 June 1995	Later labour force status				Total number
	Employment	Unemployment	Marginally attached	Other NILF	
3-month horizon probabilities (1 September 1995)					
Employment	97.2 (0.6)	1.3 (0.4)	0.1 (0.1)	1.4 (0.4)	1 401
Unemployment	22.4 (0.9)	70.0 (1.0)	3.6 (0.4)	4.1 (0.5)	2 455
Marginally attached	11.3 (2.1)	18.5 (2.7)	68.3 (3.2)	1.9 (1.1)	296
Other NILF	10.6 (2.9)	4.6 (1.9)	1.1 (0.8)	83.7 (3.4)	283
12-month horizon probabilities (1 June 1996)					
Employment	94.8 (0.8)	1.5 (0.3)	0.7 (0.2)	3.1 (0.6)	1 401
Unemployment	43.2 (1.1)	41.2 (1.1)	5.8 (0.5)	9.7 (0.7)	2 455
Marginally attached	25.0 (2.9)	17.2 (2.5)	52.8 (3.3)	5.1 (1.5)	296
Other NILF	22.1 (3.5)	4.0 (1.1)	1.6 (0.7)	72.3 (3.5)	283
24-month horizon probabilities (1 June 1997)					
Employment	91.2 (0.9)	2.3 (0.5)	1.3 (0.4)	5.2 (0.7)	1 401
Unemployment	49.4 (1.1)	30.4 (1.0)	7.5 (0.6)	12.7 (0.7)	2 455
Marginally attached	33.3 (3.0)	20.7 (2.7)	39.3 (3.2)	6.9 (1.8)	296
Other NILF	30.3 (3.7)	6.3 (2.1)	4.3 (1.6)	59.1 (3.9)	283

Notes: The sample includes all individuals that were present at the end of the survey period, and weights that account for sample attrition. The estimates for those who are initially employed or other NILF are from the PRG sample, and for those who are initially unemployed and marginally attached are from the JS sample. Estimates for those who are initially unemployed and marginally attached for the PRG sample are presented in Appendix B. The standard error for each of the transition probabilities is presented in parentheses and is estimated using standard variance estimators. Further details can be found in StataCorp (2001b, pp 69–71).

4.2.1 Short-run labour force transitions

While the probability of remaining in the same labour force state in the short-run is statistically similar for marginally attached and the unemployed (Table 4), it is much lower than the probability of remaining in employment or other NILF. However, the unemployed are significantly more likely to leave the labour force to move to other NILF (4.1 per cent), than are the marginally attached or the employed (1.9 and 1.4 per cent respectively).

Turning to movements into the labour force as it is conventionally defined (employment plus unemployment), a much higher proportion of the marginally attached enter the labour force (29.8 per cent) than do those who were other NILF (15.2 per cent). This is primarily due to differences in the probability of moving into unemployment. This suggests that over the short-run, the marginally attached have a much stronger attachment to the labour force than people classified as other NILF – a finding that confirms that the definition of marginally attached used in this paper is reasonable and accords with the underlying concept it attempts to capture.

In the short-run, the probability of moving from marginal attachment to employment (11.3 per cent) is similar to the probability of entering employment from other NILF (10.6 per cent), but is only half the probability of entering employment from unemployment (22.4 per cent). It is not really surprising that the unemployed are more likely to move into employment in the short-run given they are actively searching for work. The similarities between the transitions into employment of the marginally attached and other NILF are likely to be driven by different factors. The other NILF who move into employment in the short-run are likely to be people who were always highly employable, but changed personal circumstances mean that they have decided that they now want to work. On the other hand, the marginally attached are more likely to be responding to changes in personal circumstances that facilitate job search activity and improvements in labour market conditions, which increase chances of finding employment.

4.2.2 Medium-run and long-run labour force transitions

As the time horizon increases to the medium-run (12 months) and the long-run (24 months), the probability of movement across labour market states increases and the probability of remaining in the same labour market state declines. Unemployment appears to become less stable relative to marginal attachment, as the probability of remaining in the same labour force state only decreases to 52.8 per cent for the marginally attached but to 41.2 per cent for the unemployed over a 12-month horizon. This is consistent with the earlier observation that on average respondents experience fewer episodes of marginal attachment than of unemployment. In contrast, although the probability of remaining employed falls as the horizon increases, it remains over 90 per cent after 24 months.

The unemployed remain significantly more likely to move to other NILF than either the marginally attached or the employed at both the 12-month and the 24-month horizons. This suggests that the marginally attached have a similar attachment to the broadly-defined labour force as the employed, and a stronger attachment than the unemployed.

The probability of transition from outside the conventionally-defined labour force (employment plus unemployment) to employment increases for marginally attached and other NILF from around 10 per cent in the short-run to 25 per cent in the medium-run to over 30 per cent in the long-run. Despite this, both the marginally attached and other NILF remain significantly less likely to move to employment than the unemployed. This is probably a reflection of both differences in employability and in job search effort. In contrast, the marginally attached remain much more likely to move into unemployment than the other NILF at both the 12-month and 24-month horizons, although these transition probabilities do not increase significantly as the time horizon increases.

This suggests that there is a constant flow of marginally attached workers into unemployment where they actively look for work, and it is only after commencing an active search for work that the marginally attached enhance their employment prospects. In contrast, many of the respondents who indicated they moved from other NILF into employment appear to have done so without becoming unemployed, reinforcing our contention that such people are inherently more employable than the marginally attached.

4.2.3 Labour force transitions by broad age group and gender

Given the *a priori* expectations of differences in labour market participation for different age groups, we separately calculate the 12-month transition matrices for those under 25 years of age (younger), those aged over 25 to 44 years (prime-aged) and those aged 45 years or over (older) respondents (Table 5). Labour market behaviour is also likely to be different across gender, and these probabilities are presented in Table 6.

In general, the rates of transition between labour force states decrease with age, indicating that the older group have more stable labour market behaviour. For the younger respondents, only 42.2 per cent of those marginally attached in the initial period were still marginally attached 12 months later. This compares to 50 per cent of prime-aged marginally attached and 67.3 per cent of older marginally attached respondents. The only labour force state that was not always more stable for older age groups, in the sense that the probability of remaining in that state increased, was employment where about 95 per cent of prime-age and older groups remained in a job over a 12-month period.

The higher propensity for the unemployed to move outside the broadly-defined labour force (compared to the marginally attached and the employed) is especially evident among prime-aged and older groups. That is, the ongoing desire to work of the older unemployed appears to be eroded by unsuccessful job search. In contrast, the older marginally attached retain the desire to work although their job search activity may be constrained.

The flip-side of this observation is that the older other-NILF group are significantly less likely to move into the conventionally-defined labour force (11.9 per cent) than the prime-aged other-NILF group (32.2 per cent), who are in turn less likely to make this transition than younger members of the other-NILF group (38.2 per cent). In general, the primary difference between a marginally attached person and another NILF person entering the conventionally-defined labour force, across all age groups, lies in the relatively high probability that the marginally attached person will enter unemployment. The high probability of the unemployed moving into employment relative to the probabilities for the marginally attached and the other-NILF groups can also be observed across all age groups, although the absolute probabilities fall with age.

Table 5: 12-month Transition Probabilities by Age Group

	Later labour force status				Total number
	Employment	Unemployment	Marginally attached	Other NILF	
Aged less than 25 years					
Employment	88.8 (2.6)	3.3 (1.4)	1.5 (1.0)	6.4 (2.1)	207
Unemployment	51.6 (2.1)	35.7 (2.0)	4.7 (0.9)	7.9 (1.2)	683
Marginally attached	30.9 (5.8)	21.0 (4.9)	42.2 (6.1)	6.0 (3.0)	80
Other NILF	27.6 (9.8)	10.6 (4.1)	3.6 (2.4)	58.2 (9.7)	50
Aged between 25 and 44 years					815
Employment	96.3 (0.9)	1.0 (0.4)	0.4 (0.2)	2.3 (0.8)	1 178
Unemployment	45.5 (1.6)	40.1 (1.6)	6.1 (0.7)	8.4 (0.9)	130
Marginally attached	28.4 (4.5)	16.1 (3.6)	50.0 (4.9)	5.6 (2.7)	124
Other NILF	29.1 (4.9)	3.1 (1.2)	1.6 (1.2)	66.2 (5.0)	379
Aged 45 years and over					595
Employment	95.8 (1.1)	1.1 (0.5)	0.7 (0.5)	2.4 (0.9)	86
Unemployment	27.0 (2.0)	51.1 (2.3)	6.9 (1.1)	15.0 (1.7)	109
Marginally attached	14.3 (4.4)	14.9 (4.8)	67.3 (5.9)	3.4 (1.9)	207
Other NILF	11.4 (3.8)	0.5 (0.4)	0.3 (0.3)	87.7 (3.8)	683

Notes: The sample includes all individuals that were present at the end of the survey period, and weights that account for sample attrition. The estimates for those who are initially employed or other NILF are from the PRG sample, and for those who are initially unemployed and marginally attached are from the JS sample. The standard error for each of the transition probabilities is presented in parentheses and is estimated using standard variance estimators. Further details can be found in StataCorp (2001b, pp 69–71).

In general, females have much higher probabilities of remaining marginally attached or other NILF than do males, and somewhat lower rates of remaining either employed or unemployed (Table 6). The relative stability of marginal attachment and other NILF is consistent with the evidence presented in Table 3. Again, the unemployed are more likely to leave the broadly-defined labour force, although this phenomenon is almost entirely concentrated among females. Given that this observation is also more prominent for the older age group, it appears that older females are the driving force behind the disproportionate number of unemployed who leave the broadly-defined labour force.

Table 6: 12-month Transition Probabilities by Gender

	Later labour force status				Total number
	Employment	Unemployment	Marginally attached	Other NILF	
Females					
Employment	92.3 (1.4)	1.5 (0.6)	1.2 (0.5)	5.0 (1.2)	654
Unemployment	41.7 (1.7)	38.6 (1.7)	8.1 (11.5)	11.5 (1.1)	1 075
Marginally attached	22.3 (3.4)	15.8 (3.0)	4.0 (3.6)	3.6 (1.4)	201
Other NILF	16.2 (2.7)	4.1 (1.3)	0.8 (78.1)	78.1 (3.0)	231
Males					
Employment	96.7 (0.8)	1.4 (0.4)	0.2 (1.6)	1.6 (0.6)	747
Unemployment	44.3 (1.5)	43.1 (1.5)	4.2 (0.6)	8.4 (0.8)	1 381
Marginally attached	29.9 (5.2)	19.8 (4.4)	42.5 (5.5)	7.8 (3.4)	95
Other NILF	40.3 (9.8)	3.8 (2.1)	1.6 (1.6)	54.3 (9.6)	52

Notes: The sample includes all individuals that were present at the end of the survey period, and weights that account for sample attrition. The estimates for those who are initially employed or other NILF are from the PRG sample, and for those who are initially unemployed and marginally attached are from the JS sample. The standard error for each of the transition probabilities is presented in parentheses and is estimated using standard variance estimators. Further details can be found in StataCorp (2001b, pp 69–71).

In terms of the conventional definition of labour supply, only 20.3 per cent of females in the other NILF category were either employed or unemployed after one year compared to 44.1 per cent of the analogous males. The sex differential was less stark for marginally attached females and males with 38.1 and 49.7 per cent respectively entering the labour force after one year. In contrast to the results for other groups, the probability of males in the other NILF category entering employment after one year is 40.3 per cent. This is comparable to the probability that an unemployed male gains employment and is better than the employment prospects of the marginally attached males, although the difference is not statistically significant. For both males and females, the general result holds that marginally attached people have a higher probability of moving into unemployment than those who are classified as other NILF.

5. Factors Affecting the Transitions of the Unemployed and Marginally Attached

5.1 Method and Specification

Without a more sophisticated statistical approach it is not possible to determine the relative importance of factors which may be associated with the labour market transitions of the unemployed and marginally attached. For both these groups, there are four possible labour force states they could be observed in after 12 months. Therefore, the appropriate framework is the multinomial logit model, which allows the dependent variable to take one of four mutually exclusive and exhaustive values, $j = 1, 2, 3,$ and 4 :

$Y_{it} = 1$ if person i is employed at time t ;

$Y_{it} = 2$ if person i is unemployed at time t ;

$Y_{it} = 3$ if person i is marginally attached at time t ; and

$Y_{it} = 4$ if person i is outside the broadly-defined labour force (other NILF) at time t .

The multinomial model for respondents who were unemployed at the initial point in time is given by:

$$\text{Probability } (Y_{it+12} = j \mid Y_{it} = 2) = \frac{e^{\beta_j' x_{ij}}}{\sum_{m=1}^4 e^{\beta_m' x_{im}}} \quad (1)$$

For those who were marginally attached at the initial point in time, the multinomial model is given by:

$$\text{Probability}(Y_{it+12} = j \mid Y_{it} = 3) = \frac{e^{\beta_j' x_{ij}}}{\sum_{m=1}^4 e^{\beta_m' x_{im}}} \quad (2)$$

The sample includes respondents who were unemployed or marginally attached at the time of recruitment into the survey, and includes individuals from both the JS and PRG samples. As discussed earlier, the data used in the regression analysis are not weighted because the objective is to understand the relative importance of different factors underlying labour force transitions rather than provide population estimates. The estimates of the transitions from marginal attachment exclude transitions to other NILF since the numbers making this transition are so small that it is impossible to obtain reliable estimates of the determinants of this transition.⁹

These models are reduced form and the estimated effects should not be interpreted as estimates of a structural labour supply model. The specification of the multinomial logit model includes a number of variables which economic theory suggests will be related to labour force status or which previous empirical studies have shown to be important determinants. Care has been taken to exclude potentially endogenous variables, in particular, variables that are likely to change value over time in response to changes in labour force status. All explanatory variables are measured at the wave 1 interview, which is approximately mid-way between the two transition dates. While the details of the construction of the variables can be found in Appendix C, the remainder of this section provides a rationale for the empirical specification used. The omitted category of each set of dummy variables is also listed in Appendix C and summary statistics are provided in Appendix D.

⁹ Of the respondents who were marginally attached on 1 June 1995 only 15 were other NILF on 1 June 1996.

As a starting point, the variable choice is based on the specification used in standard employment equations and labour supply studies. Almost all analysis of employment and labour market prospects control for age, sex, education, geographic factors and family circumstances (including migrant status) as a matter of course. SEUP studies of labour force status also tend to include a control for the effect of individual disability because the data set includes information on this potential impediment to employment. Le and Miller (2000) provide a detailed background to the pertinent literature.

Age is included to capture lifecycle effects and an age squared term is included to allow for a potentially non-linear relationship. The highest level of educational attainment is also included to capture differences in the human capital, which will affect both the chances of finding employment and the probability of participating in the conventionally-defined labour market. The highest level of educational attainment is specified as a set of dummy variables indicating degree or diploma level qualification, vocational qualification, and not having left school prior to completing secondary schooling.¹⁰

Relationship status, which is included to capture family structure, is measured by whether a person is in a couple relationship, rather than being single, and whether the respondent has dependent children. Differences in the traditional gender roles regarding work and family responsibilities and the implications this has for the value placed on time outside of the work force, means that the effects of relationship status and the presence of dependent children are likely to differ by gender. Consequently we interact family structure and the presence of dependent children with gender.

The discussion of the theoretical literature suggests that local labour market conditions could be an important factor in determining the labour market behaviour of marginally attached workers, particularly those who are discouraged workers. While this literature points to the importance of both the level of and change in the unemployment rate, there appears to be very little change in the local

¹⁰ There are a small number of respondents who are participating full time in education. We have no other information on the educational attainment of these individuals. They are coded as having incomplete secondary education. While this may introduce some error into the estimates, the small numbers of such respondents will mean that any biases are small.

unemployment rates over the period examined.¹¹ We therefore only use estimates of the level of the local unemployment rate to capture regional differences in labour demand. The 1996 census data are used because they provide the most reliable estimates of small area unemployment rates at a point in time. To allow for labour demand conditions to affect males and females separately, the local unemployment rate variable is also interacted with gender.

Having a disability can severely limit a person's chances of finding employment. We therefore include a variable that measures whether the respondent has a disability. Because the nature of a disability is likely to differ between younger and older people, the disability variable is also interacted with a dummy variable for being aged 45 years or older. Other variables control for whether a migrant comes from either an English speaking background (ESB) or an non-English speaking background (NESB) and the number of years since arrival in Australia – all of which have been found to be important determinants of labour market outcomes (Le and Miller 2000).

The following estimates are based on the transitions over a 12-month period. The determinants of the transitions over 3 months and 24 months reveal similar patterns and can be obtained from the authors on request.

5.2 Multinomial Logit Results

This section presents the results of the estimates of the determinants of labour force status for those who were marginally attached and those who were unemployed at the point of selection into the survey. The validity of the estimated multinomial logit model depends partly on whether the assumption of Independence of Irrelevant Alternatives (IIA) is acceptable. This can be tested using a Hausman

¹¹ Estimates of changes in the local unemployment rate are derived using the ABS Labour Force Survey and the former Department of Social Security data. See Appendix C for further details on the construction of this variable. The seeming contradiction of lack of temporal variation in local unemployment rates and changes at the macro level may reflect the experimental nature of our estimates of the former. While the methodology is analogous to that used by the Department of Employment and Workplace Relations (DEWR) in estimating the labour market conditions in statistical local areas, the process of averaging out unemployment rates within the respective deciles of socioeconomic status may highlight the unreliability of the derived estimates.

test, which suggests that the following models are well specified, at least in terms of IIA (Greene 2000).

As the multinomial logit model results themselves are not straightforward to interpret, the estimated marginal effects are presented for the unemployed sample in Table 7, and the marginally attached sample in Table 8.¹² The marginal effect is usually calculated as the effect of a one unit change in an explanatory variable from its sample average on the probability of being in each of the labour force states after 12 months, holding all other variables at their average value. In the case of binary variables, the marginal effect is the effect of having the characteristic, given that all other variables are at their average value. The marginal effects for each variable sum to zero across the labour market states since each respondent must be in one, and only one, labour force state.

For the results reported in Tables 7 and 8, the marginal effects for the variables interacted with gender are calculated as the effect of changing the characteristic given that all other variables are set to the average values for the male or female sample as appropriate. The marginal effects of the interaction terms for disability are calculated from the average of the younger and older samples respectively.

As an example of the interpretation of the marginal effects, consider the effects of being one year older than the average person in the sample. This raises the probability of moving from unemployment to employment by 1.6 percentage points. Having a degree or diploma qualification decreases the probability of still being unemployed after 12 months by 9.7 percentage points. Being male increases the probability of still being unemployed by 5 percentage points, assuming that all other characteristics are at the sample average for the male sub-sample. The marginal effect of being female would be equal and oppositely signed to the marginal effect of being male if they were evaluated at the same sample averages. However, if this marginal effect is evaluated at the average characteristics of the female sub-group, it is slightly different at -4.9 percentage points.

While educational attainment is a major determinant of transitions of both the unemployed and marginally attached, the pattern differs. For the unemployed, the overall pattern is that an increase in educational attainment significantly increases

¹² The parameter estimates are presented in Appendix E.

the chances of moving into employment and significantly decreases the probability of remaining unemployed. For the marginally attached, it is only the lack of a complete secondary schooling that has a statistically significant negative effect on becoming employed, although point estimates suggest that there is a positive relationship between education and employment prospects.

Table 7: Marginal Effects for 12-month Labour Force Transitions from Unemployment

	Employed	Unemployed	Marginally attached	Other NILF
Age	1.6*	-1.0	-0.2	-0.4
Degree or diploma qualification	7.6*	-9.7*	-0.2	2.3
Vocational qualification	4.1	-6.1*	-1.8	3.9
Incomplete secondary education	-8.1*	4.8	1.2	2.1
ESB migrant	3.8	-5.8	3.5	-1.5
NESB migrant	-8.6*	7.0*	1.5	0.1
Year of arrival in Australia	-11.7*	8.5*	0.2	3.1
Male ^(a)	-3.5*	5.0	0.2	-1.7
Male × couple family	2.8	-2.6	0.5	-0.8
Male × dependent children	1.9	1.4	-1.6	-1.6
Male × local unemployment rate	-0.6	0.7*	0.0	0.0
Female ^(b)	3.1	-4.9	-0.3	2.2
Female × couple family	1.0	-7.8	4.1*	2.7
Female × dependent children	-7.9*	-5.8*	2.6	-0.6
Female × local unemployment rate	-1.0*	0.7	0.4	-0.1
Younger × has a disability ^(c)	-12.1*	8.6*	1.9	4.5*
Older × has a disability	-14.0*	6.2	1.7	6.1*
Probability	43.6	42.7	5.7	7.9

Notes: Marginal effects are derived from the estimates of the determinants of labour force status and are calculated using numerical methods (see Stata 2001a, pp 333–334). * indicates that the marginal effect is statistically significant at the 5 per cent confidence level.

(a) Marginal effects calculated using the averages of the male sample.

(b) Marginal effects calculated using the averages of the female sample.

(c) Marginal effects calculated using the averages of the younger and older samples respectively.

For the unemployed, having a degree or diploma level qualification decreases the chances of remaining unemployed after 12 months by 9.7 percentage points and significantly increases the chances of becoming employed. Having a degree or diploma level qualification is found to have no statistically significant effect upon the labour force transitions of the marginally attached, although the point estimates suggest that there are economically significant effects that are roughly half the size of those for the unemployed sample.

For the unemployed, having a vocational qualification is estimated to decrease the chances of remaining unemployed by 6.1 percentage points, increase the chance of moving to employment by 4.1 percentage points, and increase the chances of becoming other NILF by 3.9 percentage points. As with higher-level qualifications, having a vocational qualification has no statistically significant impact on the labour force transitions of the marginally attached, although the estimates suggest that vocational qualifications have an economically important positive effect on the probability of becoming unemployed and an economically significant negative effect on the probability of becoming employed.

Having an incomplete secondary education (and no post-secondary educational qualifications) is estimated to decrease the chances of moving from unemployment to employment and to increase the chances of remaining unemployed, although these effects are not significant. For the marginally attached it is also estimated to decrease the chances of moving to employment by 12.6 percentage points and to increase the chance of remaining marginally attached by 14.8 percentage points. In contrast, the level of education has no effect on the transition from unemployment to marginal attachment.

For the unemployed, being a migrant from an ESB country is found to have no statistically significant effect, but being a migrant from a NESB country is found to decrease the chances of moving to employment by 8.6 percentage points and to increase the chances of remaining unemployed by 7 percentage points. Year of arrival in Australia is found to have quite a strong effect on the labour force transitions of the unemployed, with more recent arrivals being more likely to remain unemployed and less likely to move to employment. For the marginally

attached, being a migrant is found to be unrelated to labour force transitions, with the controls for being a migrant from an ESB or a NESB country being statistically insignificant. Year of arrival in Australia is also found to have no effect.

Table 8: Marginal Effects for 12-month Labour Force Transitions from Marginal Attachment

	Employed	Unemployed	Marginally attached
Age	1.7*	-1.4	-0.3
Degree or diploma qualification	4.7	-5.8	1.1
Vocational qualification	-10.0	7.2	2.7
Incomplete secondary education	-12.6*	-2.2	14.8*
ESB migrant	-7.8	-0.9	8.7
NESB migrant	-6.8	-3.2	10.0
Year of arrival in Australia	-2.1	16.2	-14.1
Male ^(a)	-41.1*	6.9	34.3*
Male × couple family	12.0	-1.7	-10.2
Male × dependent children	-12.1	-7.3	19.4
Male × local unemployment rate	0.7	1.8	-2.5
Female ^(b)	15.5*	5.1	-20.6*
Female × couple family	-6.0	-1.6	7.6
Female × dependent children	-14.2*	2.1	12.1
Female × local unemployment rate	-1.3	-0.0	1.4
Younger × has a disability ^(c)	-4.7	-5.2	10.0
Older × has a disability	9.6	-12.4*	2.8
Probability	21.2	15.4	63.4

Notes: Marginal effects are derived from the estimates of the determinants of labour force status and are calculated using numerical methods (see Stata 2001a, pp 333–334). * indicates that the marginal effect is statistically significant at the 5 per cent confidence level.

(a) Marginal effects calculated using the averages of the male sample.

(b) Marginal effects calculated using the averages of the female sample.

(c) Marginal effects calculated using the averages of the younger and older samples respectively.

Gender does not appear to have a statistically significant direct effect on the probability of moving from unemployment to other labour force states. However, marginally attached males are 34.3 percentage points more likely to remain marginally attached and are 41.1 percentage points less likely to be employed than if they were female. On the other hand, females are 15.5 percentage points more

likely to gain employment and 20.6 percentage points less likely to remain marginally attached.

Relationship status appears to be more important for unemployed females and the marginally attached of both genders than it is for unemployed males. Unemployed females who are in a couple are significantly more likely to become marginally attached and are less likely to remain unemployed than females who are not in a couple, although the latter effect is not statistically significant. Marginally attached males in a couple are more likely to become employed and are less likely to remain marginally attached than their single counterparts, and this effect is reversed for marginally attached females in a couple. Again, while these effects are economically significant, they are not statistically significant. Overall, this suggests that females in a couple have a stronger tendency to be marginally attached, which is consistent with the idea that females in a couple are often the second earner.

Unsurprisingly, the effect of having children for females works in the same direction. Females with dependents are more likely to remain marginally attached, or become marginally attached if they are unemployed, at the expense of becoming employed, than females with no dependents. The presence of dependents has a minimal effect on the labour market transitions of unemployed males, but marginally attached males with dependents are significantly more likely to remain marginally attached, and are less likely to become employed, than males without dependents.

Local labour market conditions have a significant but apparently limited impact on the labour force transitions of the unemployed. For both males and females, an increase in the local unemployment rate of 1 percentage point from the average slightly increases the probability of remaining unemployed by 0.7 percentage points and reduces the probability of moving from unemployment to employment. The only statistically significant effect of local labour market conditions on the transitions of the marginally attached is to reduce the probability of males remaining marginally attached by 2.5 percentage points. There is also a small increase in the probability of moving from marginal attachment to employment, which may reflect that fact that marginal attachment is a broader concept and that

these individuals are more affected by changes in personal circumstances and incentive structures that are not as closely tied to labour demand conditions.

While the effects of local labour market conditions are found to be quite small, this may also be a product of the relatively indirect measure of labour market conditions used. Analysis using more detailed geographic information may lead to finding an impact from local labour market conditions, but this is not possible using the public release SEUP data set. As mentioned above, the SEUP data were collected over a period of fluctuating employment growth following a recession. Both the labour market dynamics and the determinants of the transitions may differ if the labour force transitions were considered at a different point of the macroeconomic cycle.

As expected, having a disability significantly reduces the prospects of the unemployed moving into employment. Younger disabled people are 12.1 percentage points less likely to become employed, while older disabled people are 14 percentage points less likely. Offsetting this, both groups are more likely to remain unemployed and to leave the labour force entirely (NILF), and the magnitudes of these effects are similar across the two groups.

For the marginally attached, the only statistically significant transition is that older disabled people are 12.4 percentage points less likely to enter unemployment. This is offset by an economically large marginal effect of 9.6 percentage points of entering employment. This suggests that older disabled respondents may have left the work force due to an injury or illness, which was preventing them from working temporarily. For example, being on workers' compensation or leave without pay while recovering from a disability means that they will not be looking for work, and hence are excluded from the conventionally-defined labour force, but are likely to return to their old job. In contrast, younger disabled people who are marginally attached are 10 percentage points more likely to remain marginally attached and have a roughly equal decreased probability of moving into employment or unemployment.

6. Conclusion

This paper provides evidence on whether Australia's marginally attached can be thought of as representing part of the effective labour supply. Longitudinal data from the SEUP have been used to compare the labour market dynamics of various groups, and multivariate regression techniques have been used to estimate what factors are most strongly related to the labour force transitions for the unemployed and marginally attached.

The analysis of labour market dynamics demonstrates that there are few differences between the dynamic behaviour of the marginally attached and the unemployed. The two groups have a similar probability of remaining in the same labour force state, although they are slightly different in the extent to which they move completely out of the labour force. The key difference is that the marginally attached find it more difficult to secure a job in the short-run, and many have to spend some time in active job search before they find work. Given that the marginally attached have a similar rate of transition into employment as the other NILF category, this indicates their reasons for not searching for work are very different – probably indicating differences in personal circumstances. Overall the transition analysis suggests that the marginally attached have a similar attachment to the labour force as the unemployed, which is an argument for including both groups in assessing effective labour supply.

The regression analysis of transition teases out the differences in the effect of personal circumstances on the dynamic behaviour of unemployed and marginally attached. A broad pattern evident in the regression analysis is that, for the unemployed, personal circumstances affect the probability of finding employment relative to that of remaining in unemployment, but they only have limited effects on other labour force transitions. For the marginally attached, personal circumstances tend to affect the transitions between all the labour force states. While the overall transitions are similar for the unemployed and marginally attached populations, the factors driving their behaviour can differ substantially.

Educational attainment is positively correlated with the probability of finding work for both groups. Family structure also has an effect on the dynamic labour market outcomes for both the unemployed and the marginally attached, and as

hypothesised, the effects vary with gender. The presence of dependent children reduces the probability of both groups moving into employment, although the results suggest that for males with dependents, there is an offsetting effect. Having a disability decreases the probability of finding employment for both groups, although the effect is larger and more statistically significant for those who are unemployed. However, having a disability among the older marginally attached is associated with large transitions into employment (especially in the medium and long-run), apparently without an intervening spell of unemployment. If, as we speculate, this is related to the recovery from an injury or illness that prevented them from working, then there is an argument for including them as a part of the aggregate labour supply because their attachment to the labour force is strong.

While there are similarities in the aggregate labour market dynamics of the marginally attached and the unemployed, the factors that are correlated with transitions between the labour force states are quite different. This suggests that the decision about whether or not the marginally attached are classified as being part of the aggregate labour supply depends on the policy question being asked. For example, if we want to consider the macroeconomic effects of changes to family policy, such as the affordability of childcare, our analysis suggests that we should count marginally attached females as a part of the potential labour supply.

In general, this analysis suggests that a range of measures of potential labour supply should be considered, and as such it supports recent moves by the ABS to publish such data (ABS 2002). However, it should be noted that the recent ABS initiative only includes a small subset of marginally attached workers in the alternative measures of labour supply (mainly discouraged workers). The analysis in this paper suggests that a much higher proportion of the marginally attached should be considered in measures of effective labour supply.

Appendix A: Comparison of ABS Gross Flows Data and SEUP Data

Table A1: 1-month Transition Probabilities
ABS gross flows data

From June 1995	Later labour force status		
	Employment	Unemployment	Other NILF
Employment	95.8	1.3	2.9
Unemployment	20.2	61.9	17.9
Other NILF	4.9	3.1	92.0

Source: Labour Force, Australia, ABS Cat No 6203.0

Table A2: 1-month Transition Probabilities
SEUP data

From 1 June 1995	Later labour force status			Total number
	Employment	Unemployment	Other NILF	
PRG sample				
Employment	98.1 (0.5)	0.7 (0.2)	1.1 (0.5)	1 623
Unemployment	15.2 (4.1)	82.6 (4.2)	2.1 (1.2)	192
Other NILF	2.5 (0.8)	3.0 (1.2)	94.5 (1.4)	482
JS sample				
Unemployment	9.3 (0.5)	87.7 (0.6)	3.0 (0.3)	3 623

Notes: These calculations include individuals who leave the sample at a later date, who are not included in the transition probabilities reported in the main text. Standard errors are shown in brackets. The estimates are based on the weighted sample but the actual sample size is reported.

Appendix B: PRG Transition Probabilities for the Unemployed and Marginally Attached

From 1 June 1995	Later labour force status				Total number
	Employment	Unemploy- ment	Marginally attached	Other NILF	
3-month horizon probabilities (1 September 1995)					
Unemployment	33.3 (5.9)	63.3 (5.9)	2.4 (1.7)	1.0 (1.0)	137
Marginally attached	5.8 (2.1)	7.0 (3.2)	87.3 (3.8)	0.0 (na)	117
12-month horizon probabilities (1 June 1996)					
Unemployment	54.5 (5.6)	35.1 (5.1)	5.4 (2.1)	5.0 (2.2)	137
Marginally attached	19.5 (4.1)	11.0 (4.3)	67.1 (5.6)	2.3 (1.6)	117
24-month horizon probabilities (1 June 1997)					
Unemployment	56.9 (5.5)	24.1 (4.3)	9.1 (2.7)	9.9 (2.9)	137
Marginally attached	24.0 (4.9)	8.6 (2.8)	48.7 (6.3)	18.7 (7.1)	117

Notes: Weighted sample. Standard errors are shown in brackets.

Appendix C: Data Definitions

All variables are measured at the wave 1 interview with the exception of the local unemployment rate.

Age is measured at recruitment, and is reported in five-year bands, e.g. 15 to 19 years. We have replaced this with the age at the midpoint of the band.

Male is set to one if the respondent is male, and zero otherwise.

Degree or diploma is set to one if the respondent's highest educational qualification is a higher degree, a post-graduate diploma, bachelor degree, under-graduate diploma or an associate diploma, and zero otherwise.

Vocational qualification is set to one if the respondent's highest educational qualification is a skilled vocational qualification, a basic vocational qualification, or other post-school qualification, and zero otherwise.

Incomplete secondary is set to one if the respondent's highest educational qualification is less than the highest level of secondary school or the respondent is still at school. The small number of respondents still participating in education were included in this category since parameter estimation was unstable if this was included as a separate variable. Exclusion of such individuals would not be desirable since the decision to participate in education is related to perceived labour market opportunities (Lewis and Koshy 1999).

Couple family is set to one if the respondent's family type is a couple family, and zero otherwise.

Dependent children is set to one if the respondent has a dependent child aged under 15 years of age in the family, and zero otherwise.

Has a disability is set to one if the respondent has a disability, and zero otherwise.

ESB migrant is set to one if the respondent is a migrant from an English speaking country, and zero otherwise.

NESB migrant is set to one if the respondent is a migrant from a non-English speaking country, and zero otherwise.

Year of arrival in Australia is the number of years since arrival in Australia. It takes the value of zero for respondents who were born in Australia.

Older is set to one if the respondent is aged 45 years or older, and zero otherwise.

Local unemployment rate is captured by the rate of unemployment in the respondent's postcode at the time of the 1996 census. Given that the only geographic data in SEUP are the variables which indicate the decile of socio-economic status (SES) for each postcode at the time of the 1991 census (i.e., the so-called 'SEIFA index of relative advantage'), the local unemployment rates are averaged out for each SES decile using standard ABS concordance files and allocated to each SEUP respondent. The SEIFA index is not defined for 49 postcodes throughout Australia. However, the loss of information is not large given this number reduces to only 19 missing postcodes if the focus is on areas with valid data on unemployment rates.

An alternative measure was constructed to examine the variation in unemployment rates over the survey period. This second measure uses quarterly ABS data on labour force status in each Labour Force Region, which is distributed to each postcode using weights constructed from Department of Social Security data on unemployment-related benefits and 1996 census data on working-age population and labour force. Between 1 714 and 1 996 unemployment-related beneficiaries failed to provide valid postcode data. This is miniscule compared to the number of unemployed throughout Australia (<0.25%). All weights were normalised so that they summed to one in each Labour Force Region. An estimate on the quarterly variation in unemployment (as well as labour force and population) in each postcode is linked to SEUP information on the SES of an area. Compatible data

from all sources were only available for seven quarters. One issue is that the LFS started using the 1996 census geography from September 1997 and hence it is not possible to accurately match areas using their 1991 postcode information provided in the SEUP. This exercise revealed that there was little variation in local unemployment rates, at least within each decile of SES, in the period examined (data available from authors on request).

Appendix D: Summary Statistics of Sample used in Regression Analysis

Table D1: Summary Statistics Regression Sample by Labour Force Status				
Initial point in time				
	Unemployed		Marginally attached	
	Mean	Standard deviation	Mean	Standard deviation
Age	33.502	12.300	34.000	13.200
Degree or diploma qualification	0.116	0.321	0.126	0.332
Vocational qualification	0.206	0.404	0.132	0.339
Incomplete secondary education	0.493	0.500	0.583	0.494
ESB migrant	0.090	0.286	0.094	0.292
NESB migrant	0.205	0.403	0.190	0.393
Year of arrival	0.105	0.306	0.116	0.321
Male	0.585	0.493	0.319	0.466
Male × couple family	0.382	0.486	0.196	0.398
Male × dependent children	0.260	0.439	0.174	0.380
Male × local unemployment rate	6.109	5.718	3.186	5.023
Female × couple family	0.229	0.420	0.411	0.492
Female × dependent children	0.219	0.413	0.433	0.496
Female × local unemployment rate	4.262	5.491	6.930	5.549
Younger × has a disability	0.218	0.413	0.200	0.401
Older × has a disability	0.108	0.310	0.144	0.352
Number of observations	3 709		499	

Appendix E: Multinomial Logit Estimates of Transition Probabilities, Unemployed and Marginally Attached

Table E1: Multinomial Logit Estimates of 12-month Transitions from Unemployment

	Employed	Marginally attached	Other NILF
Age	0.061 (0.023)*	-0.006 (0.044)	-0.031 (0.039)
Age squared	-0.001 (0.000)*	0.000 (0.000)	0.001 (0.001)
Degree or diploma qualification	0.414 (0.156)*	0.215 (0.305)	0.510 (0.280)
Vocational qualification	0.242 (0.132)	-0.195 (0.277)	0.578 (0.236)*
Incomplete secondary	-0.298 (0.112)*	0.103 (0.217)	0.152 (0.212)
ESB migrant	0.227 (0.152)	0.638 (0.258)*	-0.066 (0.263)
NESB migrant	-0.367 (0.129)*	0.086 (0.234)	-0.149 (0.211)
Year of arrival in Australia	-0.487 (0.169)*	-0.152 (0.291)	0.156 (0.270)
Male	-0.195 (0.309)	-0.081 (0.620)	-0.358 (0.520)
Male × couple family	0.122 (0.129)	0.195 (0.292)	-0.060 (0.233)
Male × dependent children	0.010 (0.123)	-0.421 (0.289)	-0.290 (0.235)
Male × local unemployment rate	-0.029 (0.016)	-0.007 (0.038)	-0.022 (0.031)
Female × couple family	0.218 (0.134)	0.671 (0.223)*	0.456 (0.207)*
Female × dependent children	-0.339 (0.135)*	0.148 (0.221)	-0.204 (0.206)
Female × local unemployment rate	-0.043 (0.020)*	0.024 (0.031)	-0.027 (0.030)
Younger × has a disability	-0.411 (0.105)*	0.187 (0.200)	0.425 (0.176)*
Older × has a disability	-0.598 (0.177)*	0.121 (0.293)	0.382 (0.240)
Constant	0.179 (0.433)	-2.241 (0.814)*	-1.186 (0.726)

Number of observations = 3 012

LR $\chi^2(51) = 331.01$

Pseudo $R^2 = 0.050$

Log likelihood = -3 180.2

Notes: Standard errors are presented in parentheses and * indicates significance at the 5 per cent level.

**Table E2: Multinomial Logit Estimates of 12-month Transitions
from Marginal Attachment**

	Employed	Marginally attached
Age	0.173 (0.096)	0.086 (0.080)
Age squared	-0.003 (0.001)*	-0.001 (0.001)
Degree or diploma qualification	0.645 (0.652)	0.458 (0.612)
Vocational qualification	-0.979 (0.581)	-0.359 (0.499)
Incomplete secondary	-0.424 (0.452)	0.382 (0.414)
ESB migrant	-0.379 (0.626)	0.187 (0.506)
NESB migrant	-0.132 (0.637)	0.375 (0.549)
Year of arrival in Australia	-0.871 (0.683)	-1.011 (0.568)
Male	-1.287 (1.248)	0.767 (1.113)
Male × couple family	0.539 (0.609)	-0.122 (0.541)
Male × dependent children	-0.106 (0.608)	0.726 (0.559)
Male × local unemployment rate	-0.058 (0.079)	-0.133 (0.072)
Female × couple family	-0.191 (0.439)	0.233 (0.382)
Female × dependent children	-0.856 (0.477)	0.017 (0.426)
Female × local unemployment rate	-0.065 (0.063)	0.025 (0.053)
Younger × has a disability	0.094 (0.432)	0.463 (0.374)
Older × has a disability	2.331 (0.885)*	1.514 (0.750)*
Constant	-0.029 (1.616)	-1.136 (1.387)
Number of observations = 422		
LR $\chi^2(34) = 81$		
Pseudo $R^2 = 0.102$		
Log likelihood = -360		
Notes: Standard errors are presented in parentheses and * indicates significance at the 5 per cent level.		

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