

# Housing, location and employment

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## EXECUTIVE SUMMARY

Do housing markets and housing policies provide incentives for economically disadvantaged people to live in areas of low employment opportunities? Does living in such an area directly impede employment prospects? This paper presents the research plan for a project that will examine these questions focusing on working age income support recipients and other members of the low-income population across Australia.

The project has the following two objectives:

- To describe the role of employment and housing in influencing the locational choice and geographic mobility of income support recipients and other low-income groups.
- To estimate the direct effect of housing location on employment outcomes.

These research objectives are relevant to policy decisions about the mobility rules imposed on income support recipients, the location of public housing, planning regulations, geographical aspects of housing assistance as well as a wider range of policies directed at people in different tenures and locations.

There has been a substantial amount of previous research conducted in Australia and elsewhere on the *determinants of geographic mobility*. This research has focussed on identifying the roles of housing costs, employment opportunities and variations in welfare benefits across regions (Australian research has focussed on the first two of these). Most research has found a strong role for housing costs in influencing mobility, but usually only a small impact of labour market conditions (or welfare benefits).

Two recent Australian studies of direct relevance to this project are those by Morrow (2000) and Dockery (2000). Morrow finds that people receiving unemployment payments tend to move to regions of greater employment opportunities. Dockery, however, finds that locational decisions are generally not responsive to regional employment opportunities.

It is possible that these divergent results stem from difficulties in measuring (and defining) the employment opportunities associated with different regions. For example, some regions have high unemployment rates, not because they are very remote from job opportunities, but because housing costs are low and so these are the only regions where unemployed people can afford to live.

Similarly, when considering the *impact of geographic location on employment outcomes*, it is important to separate out the impact of the region from the personal characteristics of the people who live in the region. Experimental studies in the US suggest that location does matter, with youth whose families are assisted to move out of disadvantaged neighbourhoods having better outcomes.

The longitudinal data used in this present study will allow us to control for unobserved fixed personal characteristics by observing how the employment outcomes for individuals change over time as their location changes.

### Research Methods

Our research on the patterns and determinants of mobility will be based primarily upon the FaCS Longitudinal Data Set (LDS). Using this data, we will estimate several models showing the relationship between regional characteristics (such as housing costs and labour market conditions) and mobility outcomes.

Our measures of labour market conditions will be based primarily upon data from the 1996 Census. Conventional small area estimates of labour market conditions, such as the unemployment rate of the people who live in the region, do not take account of the commuting opportunities for people who live in or near cities. We will utilise journey to work data to calculate measures of labour demand that are appropriate for the potential travel region of each individual.

In addition, some complementary analysis using the previous residence information in Census 1% file will be undertaken.

To identify the impact of location on employment, a variety of approaches will be employed. The first is to focus on groups that are relatively homogeneous with respect to their labour market disadvantage. Thus we will examine lone parents in public housing, and unemployed people who have the same duration of receipt of unemployment benefit.

In addition, we will examine the employment outcomes of people who move location. By looking at changes in the employment patterns of individuals over time, we can control for unobserved personal fixed effects (ie some people may have higher skill levels than others). This method cannot control for some unobserved effects which change over time (eg receiving job offers in another region) but we do not think that this will lead to large biases in the results.

# 1. INTRODUCTION AND RESEARCH QUESTIONS

## 1.1 Policy Issues

Do housing markets and housing policies provide incentives for people to live in areas of low employment? Does living in such an area directly impede employment prospects? Does policy encourage geographic mismatch between jobseekers and jobs? This project will examine these questions focusing on income support recipients and other members of the low-income population across Australia.

It is speculated that housing factors may lead to unfavourable labour market outcomes because the geographic location of affordable housing is often in regions with poor employment opportunities.

More specifically, the project will address two sets of research questions:

1. What factors influence the geographic mobility of income support recipients and other members of the low-income population? How important are housing costs and labour market conditions? Do housing cost patterns encourage people to move to regions with poor employment opportunities?
2. Does location influence labour market outcomes, or is it simply that people with poor labour market prospects can only afford to live in certain regions? Which characteristics of location matter most for employment outcomes?

These questions are important both for effective operation of the labour market and for the well being of individuals. It is often argued that high levels of geographic mobility among job seekers will reduce labour market friction and lead to a more efficient labour market and lower levels of unemployment (see Dockery, 2000). This mobility will be most effective if job seekers respond to labour market conditions and move to areas where they are more likely to find employment.

If, on the other hand, low incomes together with the operation of housing markets and housing policies lead people to move to regions where they are less likely to find employment, then labour market efficiency and individual welfare may be detrimentally affected. However, there is little evidence available to show whether location is in fact an important influence on labour market outcomes.

The current Social Security legislation in Australia does assume that location matters. For people receiving unemployment benefits Centrelink applies a *Move to an Area of Lower Employment Prospects* (MALEP) exclusion rule. Under this rule, people who move to an area of higher unemployment may be excluded from benefit receipt for a period of 26 weeks.<sup>1</sup>

Similarly, the recent Welfare Reform Review considered the characteristics of location, and the factors that encourage people to move to unfavourable employment regions, to be important impediments to full social participation.

Cheaper housing (including public and community housing) in [the most disadvantaged] regions may tend to attract unemployed and underemployed people with lower education and skill levels, including many in receipt of income support, adding locational disadvantage to their existing barriers to accessing employment (Reference Group on Welfare Reform, 2000, p65).

The answers to the questions posed above are also relevant to a range of housing policy questions. These include

- To what extent is the location of public housing an impediment to employment?
- Similarly, does the location of other forms of affordable housing (both private rental and private ownership) in our cities and regions reinforce the prospect of poor employment outcomes for disadvantaged groups?

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<sup>1</sup> We understand that this rule may be applied if the unemployment rate in the region the person is moving to is more than two percentage points higher than the rate in the region they are leaving. However, there is administrative discretion possible, and we have been unable to ascertain the extent to which this rule is applied.

- Should policies such as rent assistance be adjusted to encourage people to move to higher employment regions? As Hulse (2002) notes, the level of rent assistance varies little between those areas with high (eg Sydney) and low rents (eg Tasmania). This might provide an incentive for people to move to cheaper areas. However, these areas also tend to have the poorest labour markets.
- What policy options are available to improve the characteristics of location to enhance employment outcomes?

Note that the answers to these questions depend both upon the impact of policy on locational choice, but also on whether location actually has an impact upon employment outcomes. Hence, it is important to address both sets of questions raised above.

## 1.2 Methodological Considerations

It is well known that some outer urban and rural/regional areas have higher unemployment and lower employment rates than other areas in Australia. It is possible that this reflects the disadvantages associated with these regions (eg lack of economic growth, transport problems). If this is the case, then there may be a policy case for measures to encourage unemployed people to either not move to, or to move out of these regions.

On the other hand, this association might simply be a reflection of the fact that these locations are the only regions where people with low income earning potential can afford to live. If this is the case, then a policy that encouraged an unemployed person to move to a region of greater employment opportunity might not have any impact upon their labour market prospects.

Most likely, both these effects are in operation. If so, we wish to ascertain the relative importance of the two. It is also likely that the answers to these questions will depend upon the types of location considered. For example, the higher unemployment rates in the outer regions of Australia's major cities are less likely to be due to low levels of labour demand than are the high unemployment rates in rural and regional Australia. In the cities, commuting between low and high employment areas is generally feasible (though may be expensive and time-consuming).

There are two key methodological problems associated with any attempt to identify the direct impact of location on employment outcomes. First, both a person's location and employment outcome will be influenced by unobserved factors such as their underlying 'ability' (which influences past income and hence capacity to afford to live in certain areas). This means that the simple association between low cost location and low employment probability will be an overestimate of the extent to which employment is influenced by location.

One way to control for this is by using longitudinal data to look at the association between *changes* in the location and labour market outcomes of individuals. This automatically controls for any unobserved characteristics that are constant over time.

However, it is possible that these unobserved characteristics that determine both location and employment may change over time (for example, an increased desire to work due to arranging informal child-care), or the individual might move to take up a new job. In the second case, employment is influencing location rather than the other way round. Again, the existence of these phenomena means that the simple association between region and employment outcomes will be an overestimate of the causal impact of location.

In general, it is difficult to control for all these influences at the same time. In this project therefore, we will undertake several different analyses using different data sets, methods and study populations. Whilst no perfect data exists for the analysis of these questions, it is intended that the use of different methods, each requiring its own assumptions, will provide a robust methodology.

## 2. PREVIOUS RESEARCH

### 2.1 The Determinants of Mobility

Substantial research has been undertaken in Australia and other countries on the determinants of geographic mobility. One of the most important themes of this research is the importance of housing costs. This has been found to be of particular importance for low-income groups.

US research on the mobility of low-income families has focussed on three key factors, housing affordability, labour market conditions, and variations in welfare benefits across regions ('welfare magnets'). Little evidence has been found that higher levels of welfare provision have any significant impact on cross-state migration (Torrecilha and Sandefur, 1990, Clark, 1995). Labour market conditions also seem to have little impact, but there is strong evidence that people with low incomes tend to move to areas of lower housing prices (Fitchen, 1995). In the United Kingdom, there have been mixed findings with respect to the role of labour market conditions on inter-regional migration. Some studies have suggested that out-migration is encouraged by high unemployment (Pissarides and Wadsworth, 1989; Jackman and Savouri, 1992). However, Henley (2000) and Hughes and McCormick (1994) conclude that migration flows are largely unresponsive to demand for labour.

In Australia, the main focus of research has been on migration into and out of the major cities (see Hugo and Bell, 1999 and Burney and Murphy, forthcoming, for overviews). Research over the last decade has documented a substantial movement of low-income people away from the cities (Bell 1995, Flood, 1992, Bell and Maher 1995, Wulff and Bell, 1997). Greater housing affordability has been proposed as the main reason for this (Hugo and Bell, 1998). These mobility studies are mainly based upon cross-sectional census data that need to be interpreted cautiously. For example, census data can tell us whether people who are unemployed have migrated into a region within the last year. However, we do not know whether they were unemployed and then moved, or moved and then became unemployed.

Studies that collect information on the same individuals at two or more points in time (longitudinal data) can help disentangle these causal relationships. Two important recent studies are those by Morrow (2000) and Dockery (2000). These both use data from the FaCS longitudinal data set (LDS) of administrative data on income support payments. The main determinants of mobility that both authors examine are housing costs and labour market opportunities.

Morrow (2000) looks at the mobility of workforce-age FaCS clients over a twelve-month period in 1996 and 1997. He finds that clients receiving unemployment benefits tend to move towards regions with greater employment opportunities. In particular, he finds positive net migration towards the major cities accompanied by migration away from the industrial towns and coastal regions of northern New South Wales and southeast Queensland. When statistical sub-divisions are categorised on the basis of their unemployment rates, he finds that unemployed clients have a net movement out of those regions with the highest unemployment rates and a movement into the regions with the lowest unemployment rates. At the same time, the housing rent of those who move goes up faster than the rent of those who do not move. He concludes "This pattern suggests that jobseekers are willing to incur the extra costs of housing in the capital cities in exchange for greater access to employment opportunities and important services available in the capital city regions." Morrow (2000, p.27)

In contrast to the unemployed, he finds that Sole Parent and Disability Pension clients, were more likely to move out of the cities.

Dockery (2000) uses similar data to model the determinants of mobility.<sup>2</sup> Consistent with Morrow's results, he finds that those unemployment benefit recipients who moved tended on average to be slightly more likely to move to an area with a lower unemployment rate. On the other hand, he finds that the male unemployed tended to move to areas with *lower rents*.

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<sup>2</sup> He uses the 1% sample from the LDS between April 1997 and April 1998. Morrow's results appear to be based on the full LDS population.



These housing and labour market variables, together with personal characteristics, are then included in a multivariate model predicting the probability that a person will move out of a particular local labour market (LLM). When controlling for other variables, the apparent impact of labour market conditions on mobility changes. He finds that the unemployed are *less* likely to move out of regions with higher unemployment rates (though the difference is not significant for men).<sup>3</sup> They continue to be more likely to move out of regions with higher rents. He concludes that “although the unemployed are generally more mobile than persons on other forms of income support, their locational decisions do not seem responsive to regional employment opportunity” (Dockery, 2000, p 419).

This recent research raises new questions and areas for further research. First, the regional patterns of mobility identified by Morrow appear to conflict with the conclusions of the earlier research noted above which suggested that the unemployed were leaving the capital cities and moving to coastal areas and other non-metropolitan regions. It is possible that these different conclusions are due to methodological limitations in the earlier studies. The LDS results are for people who are receiving unemployment benefits both before and after their move. The earlier, Census-based, results categorise people according to their status after they move. It is therefore possible that these earlier results arose from people becoming unemployed *after* they moved out of the metropolitan regions.

That is, the apparent patterns of counter-urbanisation found in the earlier studies might be due to the impact of location on employment rather than employment status influencing location.

Though the research of Morrow and Dockery appear at first glance to offer differing conclusions as to the role of housing costs, these results are not necessarily inconsistent. Morrow finds that unemployed people who move face an increase in housing costs. Dockery finds that they tend to move to regions with cheaper housing. The two phenomena can occur simultaneously if the attraction of cheaper housing is one reason for relocation, but people who move initially face higher rents as they move into unfamiliar rental markets.

However, the different conclusions about the impact of labour market conditions are puzzling. These results probably stem from limitations in the specification of the labour market environment in both studies. In particular, the level of regional aggregation used to describe labour market conditions in these studies leads to indicators that are not accurate measures of the employment opportunities available to people living in different regions.

To describe the labour market characteristics of the regions in which people live, Dockery uses the “Local Labour Market” concept as defined in the DEETYA publication *Small Area Labour Markets*.<sup>4</sup> These regions were defined by DEETYA as “the geographical area in which individuals residing in a particular region typically commute to work or search for jobs”. However, this is not really an accurate description of these regions. In particular, the large cities are generally disaggregated into several regions, despite the fact that many people commute from one part of the city to another. In Dockery’s study, around 35 per cent of all residential re-locations of people on unemployment benefits were between different regions of the same city. To the extent to which movements between these regions determine the results he found, it is debateable whether they are a reflection of the impact of employment opportunities.

For example, consider an unemployed person who moves from, say, the North shore of Sydney to the inner West region. Though unemployment rates are much higher in the latter region, geographic access to employment is very similar. In the model estimated by Dockery (and in Morrow’s data), this person will contribute to the finding that unemployed people tend to move to higher unemployment regions. At least in this example, we cannot interpret this to mean that people are necessarily moving away from employment opportunities.

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<sup>3</sup> He also observes an association with the employment growth of the region (in absolute numbers). However, this may reflect the size of the region, and so is difficult to interpret.

<sup>4</sup> The current DEWSRB publication *Small Area Labour Markets* no longer uses this geographical grouping. Morrow uses the ABS ‘statistical sub-division’ geographic unit. The comments in the text with respect to LLMs apply equally to this geographic unit.

In general, it is not straightforward to ascertain the employment opportunities associated with a particular location. For many people, the best indicator for the employment opportunities facing a person living in one of Australia's large cities will be the unemployment (or employment) rate of the city as a whole. The variations in employment within cities are likely to reflect, in part at least, variations in housing costs and hence the ability of unemployed people to afford to live in different regions. At the same time, however, there may be other people for whom the local labour market is most important. Travel may be expensive or inconvenient for those with caring responsibilities (particularly sole parents) and for those with disabilities.

## 2.2 The Impact of Location on Employment Outcomes

It is generally accepted in the labour market literature that higher rates of geographic mobility can reduce unemployment rates by facilitating better matching of job seekers to jobs (See Dockery, 2000 for a survey). In the housing literature, Oswald (1996) has argued that higher rates of home ownership reduce mobility and hence lead to higher rates of national (or sub-national) unemployment.<sup>5</sup>

These conclusions, however, are about the impact of mobility per se. The focus here is on the impact of particular types of mobility. In particular, does moving to any area with a higher unemployment rate affect an individuals' labour market outcomes?

It is well recognised that low-income families tend to be concentrated in regions with low levels of employment, and there is evidence that this association has increased over time (Gregory and Hunter 1995). However, it is equally well recognised that it is difficult to separate out the effects of local labour markets from the characteristics of people that tend to live in different regions (eg McDonald, 1995). For example, the high unemployment rates that are observed in the outer suburbs of the major cities may be due to regional characteristics that make it difficult to find work, such as poor public transport and an inadequate supply of child-care. Alternatively, these regions may have high unemployment rates because these are the only areas in which individuals that are disadvantaged in the labour market (such as the long-term unemployed and long-term low wage workers) can afford to live. The policy implications of these two sets of explanations are quite different.

Identifying the distinct impact of location on employment is difficult, and it is not surprising that this has not been attempted in the Australian literature (to our knowledge). As noted above, there are two identification problems. First, both location and employment outcomes will be influenced by unobserved factors such as underlying 'ability' (which influences past income and hence ability to afford to live in certain areas). Second, there may be direct effects of changes in employment status on location (eg moving in expectation of getting a job, moving after taking up a new job).

Experimental methods are the ideal method to address both these issues. Some experimental evidence from the US suggests that location does matter for a range of socio-economic outcomes. Ludwig, Duncan and Hirschfield (2001) examine the "Moving to Opportunity" experiment in the US. In this experiment, families in high poverty suburbs were randomly assigned to a program of assistance to help them re-locate to higher income suburbs. Youth in the families that moved were significantly less likely to be involved in criminal activities. However, given the very different urban structures of the US and Australia, we should be very reluctant to generalise these types of conclusions to Australia.

The newly available panel data in the LDS allows us to begin to address these issues, though in the absence of experimental intervention (or some other random instrument) the results must be considered cautiously.

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<sup>5</sup> Indirect effects via land-use restrictions may also be important.

### 3. THEORY

It is useful to formalise these different relationships within a formal model. This allows a clear presentation of the key issues involved in estimating the determinants and outcomes of locational choices. Dockery (2000) presents a simple additive welfare model to describe the determinants of locational mobility. We extend this here to include job search effort as a choice variable and employment as an outcome variable. In this project, we do not attempt to estimate this theoretical model directly. Rather, it is presented to illustrate the impact of some variables that we cannot observe (such as job search effort) on the relationship between the variables that we can observe (employment status and location).

Consider a non-employed person who is currently living in region  $r^0$ . They are facing two decisions. Which region,  $r$ , should they choose to live in during the next period, and how hard should they search for employment.<sup>6</sup> They make choices so as to maximise their expected income in the next period. Using a broad concept of income, this is defined as

$$\begin{aligned} E(y) &= j(w - t_r) + (1 - j)b + a_r + H(-j) - k_r - m_{r^0, r} & (1) \\ &= b + (w - t_r - b)j + a_r + H(-j) - k_r - m_{r^0, r} \end{aligned}$$

where

$$j = J(s, p, d_r)$$

In this equation,  $j$  is the probability of finding a job which depends upon the person's job search effort,  $s$ , their skill level or marginal productivity,  $p$ , and the level of labour demand in the region that they move to,  $d_r$ . We assume a positive relationship with all three variables. The increase in employment probability with skill level can be derived from a simple non-wage clearing labour market model, and is in accord with extensive data on the skill levels of the unemployed.

Given this probability of employment, a person expects to receive a monetary income of  $j(w - t_r) + (1 - j)b$  where  $w$  is the wage level,  $t_r$  is the transport cost associated employment when living in region  $r$ , and  $b$  is the benefit level. For simplicity, we assume the wage and benefit level to be fixed irrespective of the location.<sup>7</sup>

In addition to the expected income to flow from wages or benefits, individuals are assumed to place a value on the geographic amenities of the region,  $a_r$ , and their expected level of home production or leisure  $H(-j)$ . The latter is negatively related to the probability of finding a job.

Each region also has a particular set of costs,  $k_r$ . For example, some regions will have higher housing prices. Finally, in order to move from region  $r^0$  to  $r$  the person must incur some (positive) moving costs,  $m_{r^0, r}$  (we define  $m_{r^0, r^0} = 0$ ). These costs of relocation provide an incentive for the person to remain in their current region unless some alternative region is particularly attractive for either monetary or amenity reasons. Though this model is described in terms of single individuals, many of the effects of marital joint decision making can be incorporated as an additional cost of moving (ie the relocation of the employment of the spouse).

A number of relationships can be illustrated with this simple model. In this project we are particularly interested in the factors that drive the choice of region ( $r$ ) and the importance of the choice of  $r$  on the probability of employment ( $j$ ).

<sup>6</sup> The model is easily adapted to consider part-time employed people searching for full-time employment.

<sup>7</sup> Both these conditions could be relaxed. In particular, this model could be generalised to include the possibility that a person might be excluded from benefit if they move to a region with a poorer labour market. Generalisations to multiple periods are also possible. In this case we might expect labour market factors to have less impact on older workers who have a shorter expected future time in the labour market.

### 3.1 Choice of location

Many of the issues associated with location choice can be considered under the assumption that an individual's job search effort is fixed. In this case they chose their location to maximise their expected income. This will generally mean choosing regions with high employment prospects,<sup>8</sup> good locational amenity and low costs. However, there are generally trade-offs between these characteristics, with regions of high labour demand also having high housing costs.

From equation (1), it can be seen that for people with a low probability of employment (eg the disabled) the relative costs and amenities of regions will be the key determinants of location. For these people, the choice between regions will be determined mainly by differentials in amenities and costs (and constrained by the cost of moving).

For those with a greater chance of finding employment, the impact of the different levels of labour demand in different regions will vary depending upon the net return to working. If (after transport) wages are not much higher than benefits, the impact of regional employment probability differentials on locational choice will be small. Indeed, given the negative impact of employment on home production/leisure, people with strong preferences for home production or leisure might choose to move to an area of lower employment prospects in order to reduce their likelihood of finding employment (this potential behaviour is what the MALEP policy is designed to discourage).

When net wages are higher than benefits, regional employment probabilities will influence expected incomes, and so will be expected to have some influence upon the choice of residential location.

For newly non-employed people, the factors described in this model may encourage them to move location – either to higher employment or higher amenity regions depending upon their expectations and values. For long-term non-employed people (or people experiencing multiple spells of non-employment) these factors will have influenced their locational decisions in previous periods. Movement in the next period will be determined by *changes* in the factors described above. Thus individuals may move because new job opportunities arise, the value of locational amenities or costs change, or their moving costs fall (eg they reach the end of their rental lease).

More generally, changing information about all these factors, and their future values, will influence behaviour. For example, if an unemployed person continues to fail to find work, they may adjust downwards their expected likelihood of employment (and possibly their expected wages). As this happens, the non-employment related components of (1) will become more important in deciding whether to move or not (and where to move). In this case we might expect a tendency for them to move to a region with a better balance of amenities and costs.

On the other hand, some people may commence their job search with an expectation of finding a job in their own area. An extended spell of unemployment may then lead to a lowering of their expectation of finding work in this region. If they remain hopeful of finding work elsewhere, they may then decide to move to an area with stronger labour demand.

Labour demand in this model is a broad concept designed to reflect the number of job offers that a person is likely to receive (for some given level of job search effort). We would expect it to be higher in larger labour markets (eg large cities), and higher when job growth is high and unemployment is low (ie there are fewer competitors for jobs).

In cities, the locations where labour is demanded and where people live may be quite different. Nonetheless, for simplicity we denote demand in terms of the region where the person lives. The variable  $d_r$  should thus be considered as an average index of the labour demand within feasible commuting distances from region  $r$ , and  $t_r$  defined as the average transport costs to these regions.

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<sup>8</sup> Unless they have strong preferences for home production/leisure (see text below).

## 3.2 Employment Outcomes

In this model, employment outcomes depend upon labour demand in the region in which the person lives (or moves to), the person's job search effort, and their desirability to employers. If a person has a fixed skill level and maintains a constant job search effort, then a move to a region with greater labour demand will increase the likelihood that they will find employment.

However, skill and job search effort vary across individuals, and individuals can change their job search effort (and skills to a lesser extent) over time. Hence we cannot assume that an observed correlation between location and employment outcomes is a direct result of the effect of location on employment.

First, we may note that individuals with higher skill levels will be both more likely to find a job, and also more likely to have a higher wage when they start work. As discussed above, the latter implies that they will be more likely to move to a region of high labour demand because the returns to working are greater. Hence we may observe an association between regions of high employment and locations with high labour demand that is actually due to variations in personal characteristics rather than a direct causal link. A similar association might arise via income effects, with individuals with higher expected incomes more likely to choose an area with greater amenities and lower travel time (the latter is not explicitly included in this simple model).

By observing *changes* in individual circumstances we can control for such fixed person effects (represented by  $p$  in equation (1)). However, it is more difficult to control for the impact of changes in job search effort. If job search effort increases at the same time as a person moves to high employment region, it will be difficult to separate the two effects.

The model suggests that one circumstance where these might move together is when household circumstances change. For example, when the youngest child of a lone parent starts school. A mother in this situation may both increase her job search effort and consider moving to a region with higher labour market demand. This is because the marginal value of non-work time  $\frac{\partial H}{\partial(-j)}$  has fallen, implying a higher marginal value of employment and a higher optimal level of employment.<sup>9</sup>

In order to increase her chance of finding employment, it is quite possible that she will increase both job search effort and move to a higher employment region at the same time. If we therefore observe that lone mothers who move location tend to find employment, we can ascribe only part of this association to the direct effect of location on employment.

A similar problem arises when the level of labour demand in a region contains time-varying person-level components. In particular, consider the example of a person living in the western suburbs of Sydney, who is offered a job in the eastern suburbs. Because their travel costs will be much lower, they may thus decide to move to the eastern suburbs. We will thus observe a movement from a region with relatively low labour demand, to one with higher levels of labour demand, and also observe the person starting work. However, in this case the causality is from employment to location rather than the other way round.

In the empirical analysis below we partly control for this relationship by restricting our attention to those people who do not immediately change employment status when they move.

While these two examples provide caveats to the extent to which we can infer causal impacts of location upon employment, there are many other causes of re-location that are not so problematic. As discussed above, change of region can occur for many different reasons, which do not have any direct effect upon employment outcomes. For example, people may move because their costs of moving have fallen (eg at the end of a lease), because of personal preferences about the value of amenities in each region and changing regional differences in costs.

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<sup>9</sup> Applying the standard labour supply assumption of diminishing marginal returns to home production.

## 4. RESEARCH METHODS

The project will involve a number of empirical analyses of data on patterns of mobility and employment. The key data sets to be used are the FaCS Longitudinal Data Set (LDS) and the 1996 Census.

### 4.1 The Patterns and Determinants of Mobility

The main task proposed here is a further elaboration of the methods of Morrow and Dockery using the FaCS LDS. We intend to continue their focus on the role of housing costs and labour market conditions as factors influencing the mobility of low-income groups. For housing costs, we intend to follow the approach of Dockery, who uses LDS data on the rent paid by income recipient clients to form an estimate of the housing costs in each region.

As discussed above, the specification of the labour market conditions facing people in different regions is not straightforward. For urban dwellers, labour market measures based solely upon the local environment may be misleading as they do not take account of the employment opportunities available in other regions which are within commuting distance.

One solution to this is to use metropolitan-wide indicators of labour market conditions. However, this implies an unduly even pattern of labour market opportunities. It does not take into account the significant costs that effectively confine individuals to work in sub-sections of the urban labour market.

In this project we are developing two new geographic labour market indicators. The first is *labour market size*. Using 1996 Census journey to work data we calculate the geographic location of all jobs in Australia (at the Statistical Local Area, SLA, level).<sup>10</sup> For each SLA of residence, we then calculate the number of jobs within 5, 15, 50 and 100 kilometres. These variables thus serve as an approximate indicator of the size of the labour market within various commuting distances.<sup>11</sup>

The second indicator is the *travel region unemployment rate*. For large regions, the unemployment rate is a good indicator of the balance of labour demand and supply, and of the relative difficulty of finding a job. However, the unemployment rate of the person's SLA (for example) is not necessarily a good indicator of the balance of labour supply and demand in those regions where they might feasibly find a job. The objective of the travel region unemployment rate is to calculate an index that indicates this broader balance of demand and supply.

The details of the calculation method are shown in Appendix A. In brief, the indicator is calculated by first estimating an *excess labour supply index* in each employment region. This is a weighted average of the unemployment rate in all regions of the journey to work study area, where greater weight is given to those residential regions that supply most people to the employment region's workforce. The travel region unemployment rate is then calculated as an average of this index over all employment regions where the weights are the proportion of workers who go to work in each region.

The effect of this averaging process is to calculate an index where the rate for a given region will be based on an average across all regions but with greater weight on those regions where people tend to work in the same areas. For example, some inner urban areas have high unemployment rates. But the employed people in those areas tend to work in the city centre. The city centre, in turn, draws most of its workforce from regions with low unemployment rates, and hence effectively faces quite a tight labour market. Hence the employment prospects for a person with average skill level, but living in a low-employment inner urban area will be quite good – and this will be shown in the *travel region unemployment rate*. The reason why the conventional unemployment rate is so high in the inner urban areas is not because the area has poor access to employment, but rather because of cheaper housing which permits people with poor labour market prospects to live there.

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<sup>10</sup> SLAs are equivalent to local government areas in many states. For regions outside the Journey to Work Study Areas, we assume that people live and work in the same statistical sub-division.

<sup>11</sup> A calculation based upon commuting time would be preferable to this calculation based upon distance. However, this is not feasible given the resources for this project.

In addition, we intend to complement this analysis of the LDS with an analysis of the residential mobility information available in the 1996 Census (using the 1% sample file). This permits an identification of the broader low-income population (as well as the overall population). Because this data is not longitudinal, this analysis needs to be interpreted in the light of the identification problem described earlier. That is, if we identify low income people moving to particular regions this could be because their income fell after moving, rather than their movement being due in some way to their low income status.

## 4.2 The Impact of Location on Employment Outcomes

In the absence of experimental data (or robust instruments) this project will employ a variety of approaches to identify the independent effect of location on employment. Again, the two main sources of data are the FaCS LDS and the 1996 Census 1% Household Sample File.

### 4.2.1 'Almost-homogeneous' populations

One way of controlling for unobserved heterogeneity in the population is to select sub-groups of the population that are reasonably homogeneous but live in locations with different employment opportunities.

A preliminary analysis of this type is shown in **Table 1**, based upon data from the 1996 Census 1% Household Sample File. This shows the employment patterns for Lone Parents who were living in public rental housing in both metropolitan and non-metropolitan regions of Australia. Metropolitan is defined as living in a state capital city. Tasmania, the Northern Territory and the ACT are excluded from the table.

**Table 1 Employment Patterns of Lone Parents Living in Public Housing in Metropolitan and Non-Metropolitan Regions of Australia, 1996**

Labour Force Status	Metropolitan (%)	Non-Metropolitan (%)
Employed	23.9	20.8
Unemployed	11.5	12.5
Not in Labour Force	64.5	66.8
Total	100.0	100.0
Sample Size	485	313

Source: 1996 Census, Household 1% sample file.

Public housing authorities generally attempt to provide entry to the most disadvantaged in the community, and so within each demographic category the variation in skills among public housing tenants is likely to be lower than among the overall income support population.

**Table 1** shows that lone parents living in non-metropolitan regions were less likely to be employed and more likely to be unemployed than those in the capital cities. This is suggestive of a role for labour market conditions. However, this difference is not statistically significant.

A second approach is to compare exit rates from benefit for people with the same duration of benefit receipt, but living in regions with different labour market conditions. Prior duration on benefit is generally one of the strongest predictors of the probability of exit, and so holding this constant permits a comparison of groups that are relatively homogeneous.

Some initial estimates have been made estimating the probability that unemployed people will exit from benefit (using a logistic hazard regression model) (using the 1% LDS). We compare the exit (or 'hazard') rates for people living in Western Sydney, Eastern Sydney, and the remainder of NSW.

When the model is estimated for the full population, unemployed people are more likely to leave benefit in Western Sydney than in the remainder of NSW, and more likely again in Eastern Sydney. This is in accord with other labour market indicators such as the regional unemployment rates.

However, people who leave benefit within the first year dominate these results. If we confine our attention to those who have benefit duration of more than one year, a different picture emerges. For this population, Sydney dwellers remain significantly more likely than non-Sydney dwellers to leave benefit. However, there is now no distinction between the East and West of Sydney. This suggests that, among the population of the most disadvantaged, location within large labour markets like Sydney is not important, though location in non-metropolitan labour markets can reduce employment prospects.

#### 4.2.2 *Employment Patterns of People Who Move*

An alternative, and more comprehensive, way to control for those unobserved common determinants of location and employment which are fixed over time, is to look at *changes* in the employment outcomes of individuals after they move. For example, do people who move to high employment opportunity regions find work or find better paying work? Does the opposite happen to those who move to low employment opportunity regions?

The FaCS LDS will be used to follow the employment outcomes of workforce-age FaCS clients who do and don't move. For those who move, any changes in employment patterns will be compared with changes in the characteristics of the region in which they live (eg housing cost and labour markets). The LDS only covers FaCS clients, and does not record location when a person is not receiving benefit.

To adapt to this data limitation, we plan to adopt the following design. We will select a sample of people who move location whilst receiving benefit. We will then examine a period of time both before and after the move (eg 12 months in each direction) and observe whether the fraction of time receiving benefits has increased or decreased and the association of this change with the change in locational characteristics (we can also examine part-time work in this period). A limitation of this is that we are not able to take account of subsequent moves the person may have made. However, whilst this will reduce the precision of the results, it is not likely to lead to a bias in any particular direction.<sup>12</sup>

As noted in Section 0, while these differencing methods do control for those unobserved individual characteristics which are constant over time<sup>13</sup> they do not control for the direct effect of employment changes upon location or for changes in unobserved personal characteristics. The examples given above include, a person who moves to take up a job, or who increases their preference for job-search as their children age, and thus decides to move to assist their job search. On average, jobs are more likely to be found in high employment regions, and so ignoring these types of causality will lead to an over-estimate of the effect of location upon employment.

However, the extent of this problem should not be over-estimated. In those cases where someone gains a job and *then* moves there will be no bias (we will observe a person with a job in both locations, and so not ascribe a direct effect of location upon employment). The same applies if a person loses their job and then moves. For the example of someone who changes their job search preferences and then moves, their increased chance of finding a job will arise from two factors. First they have moved to a high employment region and second, their job search effort has increased. Only the second factor leads to bias in our estimates of the direct impact of location. Hence, while the estimates provided by this type of analysis will be an upper bound to the impact of location upon employment, there are reasons to believe that this bias will not be too large.

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<sup>12</sup> Commencing in 2001 the LDS also records the receipt of the basic family benefits (paid to 85% of children). This information could be used to track families with children, however, we expect that the sample size of movers is still too small to make analysis of this data profitable in this project.

<sup>13</sup> By comparing outcomes with those of people who do not move, we can also control for changes over time (such macro-economic factors) which affect both movers and non-movers.



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## Appendix A. Travel Region Unemployment Rates

For isolated regions, the unemployment rate provides a useful indicator of the difficulty an individual is likely to find in searching for work. The higher the unemployment rate, the greater is the number of other jobseekers competing for each job.<sup>14</sup> In large cities, however, the average unemployment rate for the whole city is not appropriate indicator of labour market tightness, as the cost (in time and money) of travelling can make some areas of employment effectively inaccessible for some people. At the same time, the unemployment rate of the local area will be misleading, as many people may be able to travel to neighbouring regions to find employment.

In this appendix we develop a methodology for deriving a *travel region unemployment rate* for each region within a large urban area that takes into account the possibility of travelling to other regions. We use ABS Journey to Work (JTW) data collected in the 1996 Census to calculate weighted regional unemployment rates. This method could also be used for other regional labour market characteristics such as employment growth rates.

The JTW data show statistical local area (SLA) of usual residence cross-tabulated by the SLA of main employment. They are available separately for 8 Journey to Work Study Areas,

- 1 Sydney/Wollongong/Newcastle
- 2 Melbourne/Geelong/Latrobe Valley/Bendigo/Ballarat
- 3 Brisbane/Gold Coast/Sunshine Coast
- 4 Adelaide
- 5 Perth
- 6 Hobart/Launceston
- 7 Darwin
- 8 Canberra/Queanbeyan

For people not covered by these study areas, we define their travel region unemployment rate as the unemployment rate for their Statistical Sub-Division.

Within each study area, we define the *excess labour supply index* for a given employment area  $j$  as the weighted average of the unemployment rates in each region, with the weights being the proportion of workers in area  $j$  who live in each region. That is,

$$E_j = \sum_i^I (N_{ij}/N_{+j}) U_i$$

where  $N_{ij}$  is the number of people who live in area  $i$  and work in area  $j$ ,  $U_i$  is the unemployment rate in area  $i$ , and  $+$  denotes summation over the relevant subscript.

We then define the *travel region unemployment rate* for a region  $i$  as the weighted average of this across all employment regions, with the weights corresponding to the proportion of people from region  $i$  who work in each region. That is,

$$T_i = \sum_j^J (N_{ij}/N_{i+}) E_j = \sum_j^J (N_{ij}/N_{i+}) \sum_i^I (N_{ij}/N_{+j}) U_i$$

This calculation approach is illustrated in Table for a hypothetical case with four residential regions (1,2,3,4) and three employment regions (a,b,c). The first panel shows the unemployment rate in each residential region (identical apart from area 1). The second panel shows the work locations for people living in each region. Note that the people in areas 1 and 2 all work in employment region c.

<sup>14</sup> This assumes that the number of new jobs is proportional to the number of existing jobs. A more refined measure would be the unemployed to vacancy ratio, but this information is not available.

This data is used to calculate the excess labour supply index for each employment region. Note that the index is 2% for regions a and b because these only have workers from region 3 and 4, where the unemployment is 2% in each case.

Finally, this is used to calculate the travel region unemployment rate. Residential regions 1 and 2 now have the same rate. This is because people from both areas all work in region c.

**Table 2. Hypothetical Example of Unemployment Rate Averaging Based Upon Journey to Work Data**

<b>A. Actual Regional Unemployment Rates</b>				
Region of Residence	Unemployment Rate			
1	20.0%			
2	2.0%			
3	2.0%			
4	2.0%			

  

<b>B. Number of People Living and Working in Different Regions</b>				
Region of Residence	Employment Region			Total
	a	b	c	
1	0	0	10	10
2	0	0	10	10
3	5	5	0	10
4	4	4	2	10
Total	9	9	22	40

  

<b>C. Excess Labour Supply Index</b>			
	Employment Region		
	a	b	c
	2.0%	2.0%	10.2%

  

<b>D. Travel Region Unemployment Rate</b>	
Region of Residence	Averaged Unemployment Rate
1	10.2%
2	10.2%
3	2.0%
4	3.6%

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