



Housing tenure, mobility and labour market behaviour

Inquiry into housing policies, labour force participation and economic growth

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Acronyms and abbreviations used in this report

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHURI	Australian Housing and Urban Research Institute
AIHW	Australian Institute of Health and Welfare
ALMP	Active labour market policies
BHPS	British Household Panel Survey
CRA	Commonwealth Rent Assistance
GFC	Global Financial Crisis
HILDA	Household Income and Labour Dynamics in Australia
LVR	Loan-to-value ratio
NILF	Not in the labour force
OLS	Ordinary Least Squares
PSID	Panel Study of Income Dynamics
RBA	Reserve Bank of Australia
SA2	Statistical Area Level 2
SA3	Statistical Area Level 3
SMH	Spatial Mismatch Hypothesis
UK	United Kingdom
US	United States

Executive summary

Key points

The analysis in this report examines the relationships between housing and labour market behaviours, including geographic mobility, reservation wages (i.e. the minimum wage that an unemployed individual finds acceptable), and job search behaviour. It takes as its conceptual basis the Oswald thesis, the spatial mismatch hypothesis (SMH) and job search models. Through regression analysis of longitudinal data, it identifies some stylised relationships between housing characteristics and behaviours and outcomes in the labour market.

Key regression model findings (after controlling for individual, household and contextual factors) include the following.

- Individuals in private rental accommodation are approximately 15 per cent more likely than outright owners to report moving in any given year.
 - Owner-occupier mortgagors with low loan-to-value ratios (LVRs) exhibit the lowest rates of geographic mobility.
 - There is some evidence that risk aversion is associated with reduced geographic mobility. Risk-averse individuals in private rental accommodation are approximately 2.5 per cent less likely to report moving relative to non-risk-averse individuals in private rental accommodation.
 - Unemployed owner-occupier mortgagors with low LVRs report lower rates of job search and higher reservation wages than outright owners. Relative to outright owners, their reservation wages are approximately 6 per cent higher.
 - For the underemployed, geographic mobility does not appear to be associated with greater attachment to the labour market.
-

Key findings

This report examines the linkages between housing, housing markets and the labour market. The analysis is motivated in part by recognition that housing and housing markets play an important role in facilitating the efficient operation of the labour market. The backdrop to this report is an institutional environment, in terms of the labour market, that has undergone substantial change over the past three decades. While the aggregate labour market outcomes have proved to be reasonably robust over the past two decades, there is an understanding that continued economic growth and prosperity will be contingent on a labour market that is flexible and is supported by other policy settings that support labour market adjustment, including housing policy.

The analysis presented in this report is quantitative in nature and follows from the interrogation of the Household Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA data is a longitudinal survey that has been used widely in the social sciences, including economics, to investigate labour and housing behaviours and outcomes of Australian households and

individuals. The statistical analysis in this report examines key patterns in the data relating to: geographic mobility; job search behaviours; reservation wage determination; and transitions across different labour market states. In doing so, the analysis makes a novel contribution and extends existing research by, among other things: considering the experience of individuals classified as underemployed; exploring tenure and housing-related issues in a more nuanced way than existing studies; and examining the impact of attitudes to risk on behaviour.

The analysis in this report addresses a series of research questions, as follows.

- 1 How does geographic mobility of households differ across tenures following the loss of employment?
- 2 What effects do housing tenure and associated impediments to geographic mobility have on the labour market and related behaviours for underemployed individuals?
- 3 What roles do tenure status and related housing costs play in job search and the determination of reservation wages for the unemployed?
- 4 What impact does housing tenure have on labour market outcomes following economic shocks?
- 5 What do the findings reveal about the role that housing policy plays in influencing geographic and job mobility and behavioural responses to labour market shocks?

The key findings on the relationship between housing tenure and employment outcomes are as follows.

- Substantially lower rates of geographic mobility for owner-occupiers (mortgagors and outright owners) compared with private renters (approximately 15 percentage points lower), especially among mortgagors with low LVRs and those who own their homes outright (after controlling for individual, household and contextual factors). Owners typically move for lifestyle and reasons relating to the dwelling and not for work reasons.
- A higher propensity for geographic mobility across unemployed and underemployed individuals, although mobility is not largely influenced by work related reasons.
- The potential role of house prices as a push factor in encouraging geographic mobility. Housing costs and financial stress are strongly implicated in the dynamics of housing tenure and labour market adjustment.
- Risk averse individuals are less likely to exhibit geographic mobility over time.
- Lower rates of job search (in the order of 0.25 fewer types of search methods) and higher reservation wages (6 per cent higher) for owner-occupiers (mortgagors) with low LVRs relative to outright owners and private renters.
- Unemployed individuals tenured in private rental accommodation and social housing report significantly lower reservation wages compared to outright owners and private renters (after controlling for a range of socio-economic and demographic characteristics).
- Housing-related financial stress is associated with significantly higher rates of job search activity. Unemployed individuals who report not being able to cover housing costs use, on average, an 0.4 additional search methods per month.
- For underemployed individuals, geographic mobility does not appear to be associated with greater engagement in the labour market.
- Home owners are most likely to change jobs without moving address, compared with other tenures.

- There is some preliminary evidence that labour transitions from unemployment and underemployment differ by tenure status. The strongest effects relate to transitions from underemployment. Mortgagors with higher LVRs are most likely to transition into adequate employment following a period of underemployment between consecutive time periods.

Policy development options

The findings from the analysis have some important implications for housing-related policy development. Broadly speaking, these can be couched in two key areas.

Tax policy

Like earlier studies, the analysis in this report identifies the relatively high rates of geographic mobility among private renters (Productivity Commission 2014b). The geographic mobility of home owners, especially outright owners, is substantially lower than that exhibited by private renters. From an economic perspective, it is widely accepted that transaction taxes such as stamp duty tend to reduce the geographic mobility of owner-occupiers. This reduced mobility is one of the key considerations that drives the results of the Oswald thesis—that is, that the systemic rises in the level of unemployment experienced by economies over time can be linked to increases in home ownership rates. By curtailing the geographic mobility of individuals and households, the ability of individuals to respond to adverse labour market shocks is diminished, and higher rates of unemployment may eventuate.

It is important to note that the institutional environment in Australia is characterised by favourable tax treatment for owner-occupied housing. Both implicitly and explicitly, the tax system in Australia favours owner-occupation as a preferred form of tenure. While such a bias may be well-grounded, given the extent of private and social benefits that derive from owner-occupation, this also potentially presents a problem to the extent that owner-occupation as a form of tenure exceeds a level consistent with economic efficiency and the efficient functioning of labour markets.

From a policy perspective, the analysis in this report, and the institutional environment more generally, highlights the need to ensure that tax policy is as neutral as possible—that is, that it does not favour one tenure unduly over another. An obvious starting point for such a change in policy is the introduction of broad-based land taxes in lieu of stamp duties. While limited moves have been made in this direction, such a policy would likely offer a range of advantages to governments and individuals alike, offering overall enhancements to efficiency while minimising the negative impact of tenure choice on the ability of individuals and households to respond to adverse labour market shocks.

Transfer policy

Private renters exhibit substantially higher rates of geographic mobility than individuals in other tenures. In Australia, private renters who qualify for any of a range of government payments may receive a rent subsidy in the form of Commonwealth Rent Assistance (CRA). A key benefit of CRA is that it follows the household; unlike public or social housing, CRA is not lost by moving to a region where better employment opportunities are available. Indeed, over time, CRA has become the dominant form of housing assistance. Given the differences in rental markets across Australia, it is possible that consideration could be given to providing CRA at rates that reflect local housing market conditions. This may better facilitate the mobility of individuals and households to regions that offer better opportunities for employment and economic advancement, but with higher housing costs. In a similar fashion, public housing policy could be revised to ensure that such assistance is delivered in a way that removes potential impediments for individuals to engage in the labour market.

More generally, the analysis in this report highlights the need for the unemployed to receive support in a comprehensive manner. While there is little direct evidence that unemployed people across tenures (including those in social housing) differ in their job search intensity, the analysis highlights the need to ensure that effective and efficient support is provided for those in receipt of housing assistance to return to gainful employment. Indeed, recent reports by the Productivity Commission (2015) and the New South Wales Government (2015), emphasise the need for tenants in public housing to receive support that is comprehensive and complementary, in a way that provides opportunities to engage with the labour market. Such policy responses may encompass support for individuals to upgrade skills, and provide measures that facilitate geographic mobility so as to ensure that individuals locate to regions with strong employment prospects. There is a critical need for the supply of new social housing to be located in areas with strong employment growth, including entry level and key worker employment that is accessible to public transport, social infrastructure, and services (NSW Government 2015). Further, initiatives that facilitate mobility for home owners, to avoid them being 'trapped in place' in areas with limited economic prospects, may enhance the efficient operation of labour markets over time.

Background to the study

This report forms part of an AHURI Inquiry into housing policies, labour force participation and economic growth. The research in this report examines some key linkages between housing and labour markets. The analysis was motivated by the recognition that housing and housing markets are a critical component of an 'efficient economy' more generally. The research is informed by the Oswald thesis (1996; 1999) and the SMH (Kain 1968), and the job search models which underpin these theories. The empirical analysis focuses on a number of key economic behaviours: the geographic mobility decision, the level of job search intensity and the level of reservation wages¹.

The study is set in the context of an Australian economy that has undergone significant structural change over the past three decades. In the labour market there has been a sustained move away from the traditional centralised bargaining approach, with wage determination shifting towards the enterprise and individual workplace levels. While such changes have sought to increase the flexibility of labour markets, arguably they have also made employment more precarious and in doing so potentially created impediments to adjustment in the labour market. In the housing context, owner-occupation remains the dominant form of tenure, notwithstanding increasing prices over time, especially in the capital cities. Moreover, despite relatively strong employment performance over the past two decades, there is increasing concern around the sustainability of growth and productivity improvements over time. It is likely that housing markets and housing policy can play an important role in facilitating growth by supporting continued labour market adjustment over time.

The analysis is quantitative in nature and uses the Household Income and Labour Dynamics in Australia (HILDA) dataset for the statistical analysis. The HILDA is a large panel dataset that tracks Australian households and their occupants annually over a period of 14 years, beginning in 2001. The dataset contains an array of information about the characteristics of households and their occupants, along with detailed information on their behaviours over time. The data has been widely used in social sciences research for this reason.

¹ The reservation wage represents the lowest wage at which an unemployed individual will accept an offer of employment.

The statistical analysis uses the full 14 waves of the HILDA data available at present. The geographical focus of the analysis is Australia. The empirical research focuses on three main behaviours.

- Geographic mobility decisions across waves of HILDA. Separate analysis was undertaken for groups including the unemployed, the underemployed and couples. Moreover, alternative types of geographic mobility were analysed, including moves across distinct spatial units.
- The job search intensity of unemployed individuals.
- The level at which the reservation wage is set for unemployed individuals.

For each analysis, the key focus is on tenure and housing-related determinants of behaviour. Broader socio-economic determinants of behaviour are also incorporated in the empirical analysis.

The analysis in this report extends our existing understanding of mobility and other labour market related behaviours in a number of ways. First, the use of the HILDA data allows for the incorporation of controls for unobserved heterogeneity across individuals.² Further, the analysis examines the underemployed, a group that has received little attention previously but for whom the labour market may be characterised as leading to an inefficient outcome. In addition, the empirical analysis considers the issue of geographic mobility and job mobility jointly. Finally, a measure of risk is incorporated into the analysis.

² Unobserved heterogeneity refers to differences across individuals that cannot be observed. For example, motivation is a characteristic of individuals that is not measured accurately but may help explain behaviours such as engagement in the labour market.

1 Introduction

A labour market that facilitates adjustment to shocks and enables workers to take advantage of employment opportunities is central to ensuring continued economic prosperity by enhancing the efficient functioning of an economy. Moreover, it has been recognised for some time that housing markets can play a critical enabling role, ensuring that labour markets can function effectively by facilitating geographic mobility (Productivity Commission 2014b; Meen 2013).

Over the past three decades, a range of policy changes associated with labour markets and economic developments more generally have resulted in a prolonged period of economic growth. These policy changes have included substantial deregulation of the labour and credit markets, along with an opening of the Australian economy generally to the forces of internal and external competition. While institutions such as the Productivity Commission have argued that such changes have been largely beneficial (Banks 2005), there is recognition that in at least some dimensions housing markets and housing-related policy settings have the potential to inhibit future productivity gains (Productivity Commission 2014).

Against a backdrop of at times rapidly rising house prices, a range of policy settings have continued to encourage home ownership as the dominant and arguably most desired form of tenure. At the same time, housing assistance measures have been redirected away from in-kind transfers such as social housing and have instead relied on direct subsidies for those in private rental markets. It is in this context that the effects of housing tenure and housing policy on labour market behaviours and outcomes is examined.

The analysis adopts an economic approach. Economic agents (individuals and households) are assumed to compare the costs and benefits of alternative actions and make utility maximising decisions subject to the set of constraints faced. We explicitly explore how housing tenure impacts on those costs and benefits, and the relationship between tenure and labour market related decisions.

This report examines the relationship between housing and labour market behaviours. The methodological framework is one that is informed by ideas of neoclassical economics. The research questions that are investigated reflect the empirical observations around the behaviours of economic agents (individuals and households) in response to a 'shock' that triggers micro-economic adjustment. This perspective has shaped much of the research on housing behaviours (see, e.g., Clark 2012; van Ham 2012). Our approach is extended to incorporate: spatial context; life cycle dimensions, through a focus on age and family formation; and institutions in discussions of policy implications. The analysis that is reported reflects this conceptual framework and is quantitative in nature.

This chapter contains three significant components. We begin by providing some background to the research by examining why outcomes and behaviours in the labour market are likely to be related to housing. In doing so, we describe briefly the underlying economic model of behaviour that motivates the analysis, and more importantly, identify existing literature that has examined the outcomes and behaviours of interest. We also present some contextual information that is

important for understanding the motivation for the analysis. Over the past 30 years, significant changes have occurred in the housing environment in Australia. At the same time, labour and credit markets have also undergone significant reform and change. An understanding of the institutional changes that have occurred is critical for identifying how policy and the economic environment shapes individuals' and households' decisions around work and housing. More significantly, it provides an opportunity to identify what policy instruments may be required to shape better outcomes in the future. Finally, we present briefly the methodological approach that has been adopted in this study by introducing the data that has been used in the analysis.

1.1 The relationship between housing and labour markets

For some time it has been recognised that housing and housing markets are closely tied to the efficient functioning of the economy (Meen 2013; Oswald 1996). The focus of the research in this report is the relationship of housing to outcomes and behaviours in the labour market. These behaviours and outcomes take a number of forms and include decisions around geographic mobility, job search and reservation wages. In a very general sense, the analysis seeks to extend our understanding of the role of housing in shaping the productivity of the Australian economy.

Many Australian households aspire to home ownership at some point of the life cycle. More generally, it is well established that the ability of households to attain a desired housing tenure is closely related to the capacity and opportunities to actively participate in the labour market. In this sense, it is important to recognise that the relationship between labour and housing markets is bi-directional. An individual's or household's labour supply shapes demand for housing, and in turn housing markets can shape household decisions and labour supply.

What is less well understood is how alternative types of tenure might in fact impact upon the capacity of individuals and households to obtain and participate in paid work. Moreover, we know little about how tenure influences labour market behaviours in the context of economic restructuring and the growth of more non-standard forms of employment, including underemployment. This project investigates how housing tenure may be associated with labour market adjustment and the quality of re-employment in the face of an economic shock such as unemployment or underemployment.

The conceptual starting point for this research is the spatial mismatch hypothesis (SMH) and the Oswald thesis. While both perspectives argue that outcomes in housing markets and labour markets are intrinsically linked, the SMH and Oswald thesis are nonetheless distinct. The SMH, initially proposed by Kain (1968) to explain disparities in employment outcomes among African Americans, asserts that high rates of unemployment among lower-skilled individuals can be linked to segregation in housing markets coupled with the limited availability and accessibility of jobs where large numbers of these workers reside. In contrast, the Oswald thesis posits a causal relationship between rates of home ownership and the level of unemployment in an economy (Oswald 1996). What is common across both perspectives is the view that housing markets influence the spatial sorting and containment of households into areas with higher and lower employment prospects. Furthermore, that this spatial sorting and containment can exert an independent effect on behaviour and outcomes in labour markets, and therefore aggregate rates of employment and unemployment.

A key mechanism by which this independent effect is thought to occur is through potential enablers and impediments to geographic mobility that tend to be tenure specific. Features of housing markets, such as high transaction costs or low elasticity of supply, may inhibit individuals and households from relocating to regions and cities where employment opportunities are greater, and in doing so limit long-term economic growth. For example, the sale and purchase of housing by owner-occupiers is generally considered to have relatively high

costs, both in a financial and non-financial sense, relative to the costs incurred by renter households. For those in social housing, geographic mobility may also have high costs, because of the potential loss of a subsidised secure housing tenure following a geographic move (Productivity Commission 2014: 262–271; Productivity Commission 2015).

Tenure-specific policies related to the taxation of housing, rental assistance and public housing have also been identified by government agencies in the past as important impediments and/or enablers of geographic labour mobility (AIHW 2013; Wood, Stewart and Ong 2010; Department of Treasury 2010).³ More recently, researchers have identified the potential 'lock in' and 'lock out' effects associated with uneven house price growth in job-rich and job-poor regions, and with negative equity related to house price decline that may 'trap' home owners in place. The evidence on these effects for owners remains mixed, with some studies identifying that such developments can act to inhibit relocation between regions, and, in the event that commuting is not viable, impede economic growth (Ferreira, Gyourko et al. 2010; Donovan and Schnure 2011). Other studies find that highly leveraged owners are more likely to make inter regional moves to take up job offers (Coulson and Grieco 2013; Demyanyk, Hryshko et al. 2016). However, the impact of negative equity or high debt on geographic mobility will be influenced by policies relating to the way negative equity or loan default is governed in each jurisdiction. For instance, the process of mortgage foreclosure in Australia has differed greatly from the United States (US), where there have historically been fewer restrictions for 'handing back the keys' on defaulted loans and therefore capacity to more easily relocate. Others have noted how the potential losses associated with geographic mobility can discourage risk averse individuals from making employment and or residential location changes (Kan 2003).

1.2 The policy context

In considering the relationship between housing and labour markets, of particular interest in this research is the issue of geographic mobility and how it may enhance the efficient functioning of labour markets. To gain an understanding of how policy has shaped these outcomes, we briefly review developments in housing and labour markets in Australia over the past two decades. This effectively 'sets the scene' for the conceptual and empirical discussion by providing an institutional and policy context within which the analysis in this report can be considered.

1.2.1 Labour market developments in Australia

Historically, the labour market in Australia was relatively highly regulated. This was best exemplified by the extensive set of award wages that established a well-defined set of relative wages across industries and occupations. The award wages themselves reflected the collective bargaining model by which wage setting in Australia was determined. A defining feature of the Australian centralised wage system was a dispute resolution process that placed arbitration and conciliation at its core (Wooden 2001).

The labour market began to undergo significant change during the 1980s. Initially, change was driven by the Accord process between the Hawke–Keating Labor governments and the Australian Council of Trade Unions (Wooden 2001). These arrangements provided for wage restraint at the macro level during the 1980s and laid the ground work for more extensive changes in industrial relations during the 1990s. In particular, throughout the 1990s, successive governments deregulated labour markets so that wage determination was decentralised, initially to the enterprise level and increasingly to the individual workplace level. During the 2000s, the

³ When used in this report, the terms geographic labour mobility and residential labour mobility refer to a change in address or residential location.

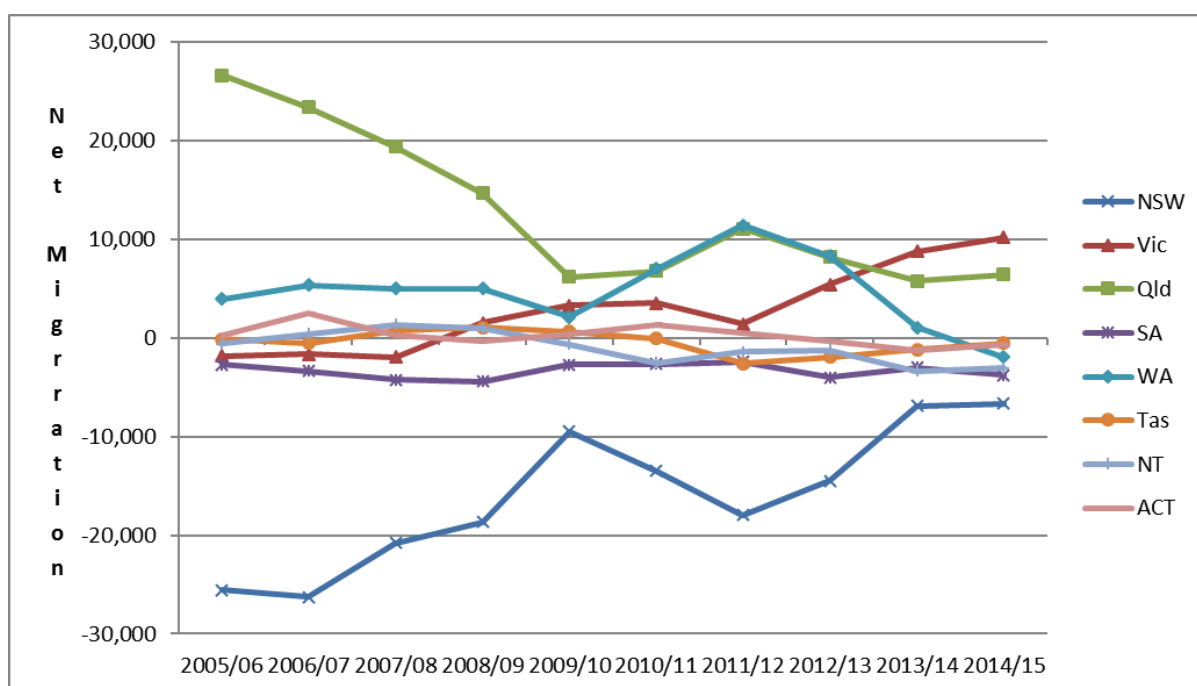
Howard government introduced the Work Choices legislation, which was in part designed to facilitate negotiation between individual employees and employers. While constitutional considerations meant that employee–employer relations were increasingly the purview of the Commonwealth Government, similar changes occurred at the state level. Indeed, this period, beginning in the 1990s, could be characterised as one in which the labour market was substantially deregulated in an effort to encourage greater productivity and efficiencies.

The performance of the Australian labour market over the past two decades can in general be described as remarkably robust, with a trend decline in unemployment and only a modest increase in unemployment following the Global Financial Crisis (GFC). Nonetheless, it is important to note that other measures capturing the health of the labour market show some deterioration. For example, the underemployment rate, which captures the extent to which individuals would like to work additional hours but cannot do so, has exceeded the official unemployment rate since the early 2000s (Campbell, Parkinson et al. 2014). More generally, the increase in total employment has largely been dominated by growth in part-time employment, much of which reflects higher rate of labour force participation rates by females and growth of service sector employment (Wilkins and Wooden 2014). Prior to this, however, the performance of the Australian labour market was mixed. During both the early 1980s and 1990s Australia experienced deep recessions, during which unemployment increased to historically high levels. While unemployment did decline over time, in each instance it was a gradual decline, with unemployment declining to levels that generally exceeded the levels experienced during the 1970s.

The higher rates of unemployment during these years also reflected the substantial structural change that was occurring in the Australian economy. One response to the economic challenges of the 1980s was to substantially deregulate various parts of the economy and open them to international competitive forces. Hence, during the 1990s Australian governments successively reduced the tariff and protections for local industries. These changes contributed to the significant structural change that the Australian economy experienced during the 1980s and 1990s. Such change is highlighted by the secular decline in the relative importance of manufacturing in the Australian economy, particularly in traditional manufacturing states such as Victoria and South Australia. These industries continue to wither, exemplified by the decision of car makers to abandon local manufacturing in Victoria and South Australia by 2017 (Productivity Commission 2014a).

The other significant development that has occurred since the early 2000s in the Australian labour market and economy more generally is the transformation associated with the mining boom. Around the turn of the century, growth in Asian markets, especially China and India, fuelled a large increase in demand for Australian resources. In particular, exports of iron ore and coal increased rapidly, and more recently a series of major gas projects have begun to come online. This increased demand led to rapid expansion of resource projects, which drew labour to the resource-rich states. Figure 1 presents the rate of net interstate migration over the decade 2005–15, highlighting the large net gains for the mining states of Queensland and Western Australia. One interesting feature of these developments is that the increased labour demand during the construction phase of these resource projects was often met through the use of fly-in fly-out (FIFO) workers, who were tenured in employer-provided housing (Productivity Commission 2014b).

Figure 1: Net interstate migration flows, 2005–15



Source: Australian Bureau of Statistics (2016a).

It is within the context of these changes in the labour market that developments in the housing market are of particular interest, in part because housing markets have the capacity to facilitate the efficient functioning of labour markets through enabling or constraining workers in being able to live in close proximity and/or ready access to employment opportunities.

1.2.2 Housing market developments in Australia

Perhaps the defining characteristic of housing in Australia is the primacy of ownership as a form of tenure. Since the Second World War, home ownership has been encouraged through explicit and implicit policy settings. Indeed, in the post-war environment, home ownership was seen as a desirable social goal and this period saw a sustained increase in the rates of home ownership. By the 1960s, around 70 per cent of Australian households were owner-occupiers; either outright owners or mortgagors (Kryger 2009). This proportion has remained relatively stable over time, notwithstanding more recent concerns that home ownership is becoming increasingly difficult to attain for younger generations. Indeed, there is some evidence that younger cohorts are less likely to attain home ownership at the relatively high rates of their parents. To date, sustained rates of home ownership have been shaped by the trade-offs that new buyers make, including their preparedness to relocate to new housing estates further away from large and central labour markets (Burke, Stone et al. 2014; Flood and Baker 2010).

Beyond home ownership, approximately 25 per cent of Australian households live in private rental tenures, with the remaining 5 per cent in public or social housing. Social housing was traditionally strongly linked to industry, providing an accessible workforce close to major employers. It has now become a housing choice of last resort for those most disadvantaged, and is characterised by long waiting lists. Rather than providing in-kind transfers through public housing, housing-related assistance has more recently been targeted through Commonwealth Rent Assistance (CRA). CRA is now received by approximately 1.35 million income units and is characterised by rapid growth over time relative to other forms of housing assistance (Australian Institute of Health and Welfare 2016). Expenditure on CRA in fiscal year 2014–15 exceeded \$4.5 billion, with nominal expenditure increasing by over one-third between 2010 and (AIHW

2016). Importantly, CRA offers substantially more flexibility than other forms of housing assistance, in that it is not location specific, but rather follows the household—an important policy mechanism for providing households with greater choices of where to locate. This is perceived as a major advantage over other forms of housing assistance, such as social or public housing, which may be lost if a household is geographically mobile.

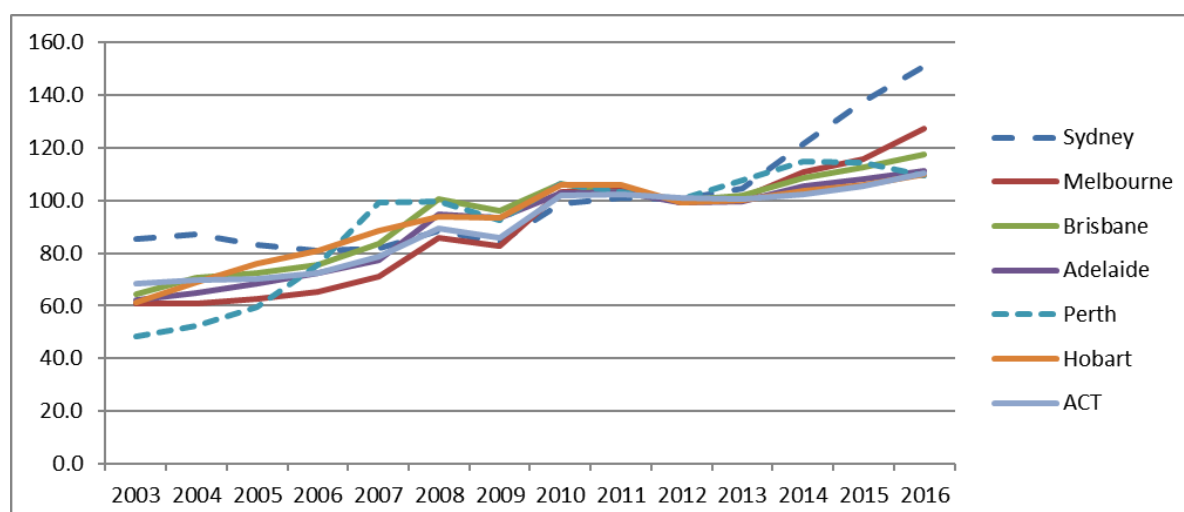
Although the flexibility offered by CRA is seen as a key advantage of this particular policy tool, the private rental sector in Australia offers limited regulation by way of international comparison. In particular, constraints associated with leases offering long-term security, absence of rent controls and an inadequate supply of affordable dwellings at the low end of the market have been identified as key concerns around the private rental sector (Hulse, Milligan et al. 2011; Hulse, Reynolds 2015). One consequence is that despite receiving CRA, a substantial number of households continue to experience affordability stress over a prolonged period of time (Stone, Parkinson et al. 2016; Wood, Ong et al. 2014).

In most cases, private rental tenures are owned by individual investors who benefit from arrangements that provide tax relief for investor owners. Indeed, this form of investment has been increasingly viewed as an important part of retirement planning, underpinned by generous tax concessions through negative gearing (Seelig, Thompson et al. 2009; Wood and Ong 2013; Yates and Bradbury 2010). Like privately owned rental tenures, home ownership is treated advantageously from a tax and transfer perspective. In general, the family home is excluded from means tests that are applied to publicly funded transfers. Similarly, owner-occupied housing is exempt from capital gains tax and the imputed rent from owner-occupied housing is not considered part of income. It has been argued that such arrangements provide a strong incentive to over-consume and over-invest in housing (Bradbury 2008).

From a labour and geographic mobility perspective, institutional arrangements associated with owner-occupied housing potentially provide incentives to be less mobile than might otherwise be the case. Such tendencies are exacerbated by the reliance of state and territory governments on taxes from the transfer of real property. Unlike many other countries, Australia does not have a broad-based land tax, but rather relies on stamp duties or transfer taxes that are imposed on the transfer of property. There is clear evidence from both Australia and abroad that such taxes act as a disincentive for households to move house over time (Davidoff and Leigh 2013; Van Ommeren and Leuvensteijn 2005). To date, only the Australian Capital Territory (ACT) has initiated changes that, over time, will see such taxes replaced by a broad-based land tax (McLaren 2013).

The other key characteristic of the Australian housing market that is relevant for the analysis in this study is the relatively high price of housing in Australia. Though direct comparisons are difficult because of the specific institutional arrangements across countries, it is widely recognised that the price of owner-occupied housing in Australia is relatively high. This is particularly so in the case of the major capital cities, such as Sydney and Melbourne (RBA 2014). In Australia, the experience over time has been of periods when housing prices increased rapidly, followed by periods when they plateau. For example, the Reserve Bank of Australia (RBA) notes that in the decade up to 2003, housing prices increased by around two-thirds relative to income (2014). Such developments are, of course, driven by a variety of considerations. Figure 2, which tracks the real price of housing across capital cities over 2003–16, shows clearly the rapid increase in prices in Perth that occurred in conjunction with the resources boom during the 2000s. Similarly, it shows that price growth has tended to moderate, and indeed in some cases prices have decreased, as the peak of the resources boom has passed.

Figure 2: Capital city house prices, 2003–16



Source: Australian Bureau of Statistics (2016c).

One feature of house prices in Australia that is striking from Figure 2 is the moderation, as opposed to decline, of house prices during the GFC. Unlike many other countries, house prices in Australia did not exhibit a significant fall during the period 2007–12. This was in part because of the sustained demand for resources from major international trading partners. While unemployment increased somewhat during this period, it remains the case that the impact on Australia was more muted than for most industrialised countries—notwithstanding a relatively large increase in the level of underemployment, which continues to persist (Wilkins and Wooden 2014). As of May 2016, the underemployment rate of 8.4 per cent exceeded the pre-GFC level of 5.9 per cent. Moreover, underemployment disproportionately affects females (10.3%) relative to males (6.8%) (ABS 2016b: 27).

1.3 Existing research

Empirical research considering the relationship between housing tenure and labour markets has relied on a mix of aggregate and/or macro data, while more recent studies have also considered microdata at the individual or household level. Many of these studies are discussed in Chapters 2 and 3. Early research tended to concentrate on the implications of the Oswald thesis and SMH for the aggregate unemployment rate—that is, those studies tried to identify evidence that higher home ownership rates were linked to higher unemployment rates. While some early studies identified a positive relationship between the level of unemployment and home ownership across a variety of countries (Oswald 1996; Oswald 1999; Isebaert, Heylen et al. 2015), subsequent studies failed to verify the earlier results or found a somewhat more muted relationship (see e.g. Flatau, Forbes et al. 2002a; Green and Hendershott 2001a). In particular, later studies found that the nature of the estimated relationship was potentially sensitive to the time period and spatial coverage of the data used. In some cases, a negative relationship between the level of home ownership and the level of unemployment was found; the opposite of the relationship hypothesised under the Oswald thesis.

Since the work of Kain (1964) there has been a plethora of studies framed by or directly setting out to test the SMH in order to explain differences in employment outcomes between segregated groups of workers across locations. Spatial mismatch studies often rely on macro measures of accessibility to jobs that is then linked to a range of employment outcomes or behaviours (Zenou 2013). Many earlier SMH studies that focused on racial segregation and employment outcomes considered the experience of the US. More recent studies examine

access to jobs by lower-skilled workers, not defined by racial segregation but rather by 'lock out' effects associated with declining affordability and processes of inner urban gentrification that has seen the displacement of lower-skilled workers to low-cost housing markets away from job opportunities. The latter perspective is more typically applied to the Australian setting, where it is argued that racial segregation is not as marked as a process of segregation as it is in the US. Rather, Australian markets are becoming increasingly segregated by affordability and incomes across all low-income or lower skilled workers, regardless of racial background (Nouwelandt, Crommelin et al. 2016; Berry 2006).

Recent studies examining the links between housing and labour market adjustment outcomes have tended to rely on micro-level data at the individual or household level. These studies have been motivated, at least in part, by greater insight into the underlying relationships between housing and behaviour and outcomes in the labour market. Such analyses have drawn on cross-sectional and panel survey data and been informed by search and matching models in the labour market (Munch, Rosholm et al. 2006). Such models posit that relationships observed in the aggregate data reflect the underlying optimising decisions on the part of economic agents. In the context of a job search model, for example, a successful match for an unemployed individual with an employer will be driven by the costs and benefits associated with search behaviour and the matching process. Housing, and the constraints imposed by housing tenure, potentially represent an important consideration in such a setting. For example, the constraints imposed by a mortgage may impact on the intensity of job search activities and the willingness of an unemployed individual to accept an offer of employment. Similarly, the cost associated with moving for a household may be an important determinant of whether an individual accepts an offer of employment and therefore the duration of an unemployment spell. The findings from such studies that have looked at more nuanced relationships, however, remain mixed and leave a range of questions unresolved.

In this study we extend the micro-economic approach and make an original contribution on a number of levels. First, the analysis is one of the few Australian studies that have considered the various dimensions that underlie the relationship between housing and labour markets. The analysis in this report extends earlier analyses by considering more contemporaneous data and incorporating a range of controls that have not been used previously. Like earlier studies, we consider the relationships between patterns of geographic mobility, employment status and housing tenure. In addition, we consider a range of related behaviours and outcomes, including job search activities and changes in reservation wages among the unemployed. Further, we examine issues related to the quality of employment and how behaviours are affected by underemployment. Moreover, unlike some earlier studies, the analysis utilises a rich panel dataset that allows for the incorporation of controls for unobserved heterogeneity across individuals.

The specific research questions considered in the report are as follows.

- 1 How does geographic mobility of households differ across tenures following the loss of employment?
- 2 What effects do housing tenure and associated impediments to geographic mobility have on the labour market and related behaviours for underemployed individuals?
- 3 What roles do tenure status and related housing costs play in job search and the determination of reservation wages for the unemployed?
- 4 What impact does housing tenure have on labour market outcomes following economic shocks?
- 5 What do the findings reveal about the role that housing policy plays in influencing labour market mobility and behavioural responses to labour market shocks?

1.4 Research methods

1.4.1 Methodological framework

The analysis in this project and the conceptual framing of the broader AHURI Inquiry is economic in nature, so the conceptual framework guiding the analysis and methodological approach draw on economic theory. More specifically, assumptions of the behavioural preferences and decisions underpinning geographic mobility, job search and reservation wage decisions have their origins in a neoclassical economic framework.⁴ This approach is generalised to incorporate life-cycle measures, contextual considerations, and the broader role of policy intervention in shaping behavioural outcomes. The strength of the economic approach is that it provides a coherent theoretical framework through which to understand the behaviours of economic agents.⁵ One limitation with the approach is that it provides a relatively stylised way with which to characterise decision-making on the part of agents. Notwithstanding this limitation, the framework provides one means by which to analyse the behaviours and outcomes of economic agents in a quantitative fashion.

The general approach in neoclassical economics is to argue that economic agents make the best possible decisions given the constraints that they face. They do so by comparing the costs and benefits of alternative decisions. The manner in which this is usually formalised is that agents are assumed to maximise utility subject to a budget constraint. Utility can simply be considered a measure of well-being or satisfaction, where that well-being is derived from consumption of goods including housing. In this setting, interest is generally focused on how behaviour and outcomes change when the constraints that agents face are altered. It is important to emphasise that the constraints faced by agents will be driven by a range of factors, including the agents' own decisions, policy decisions by governments and wider economic conditions.

The analysis in this report will consider how the behaviours and outcomes experienced by economic agents differ across housing tenures. Our principal interest relates to the implications of these differences for labour market behaviours and outcomes. As a starting point, we argue that housing tenure, among other considerations, has important implications for the constraints faced by individuals and households. Put another way, the costs and benefits associated with a decision will differ depending on the nature of housing occupied. At this point, an obvious question to pose is: *why and how might the constraints and costs faced by households differ by tenure status?*

There are a number of ways in which housing tenure affects the costs and benefits associated with various decisions. In some cases, the differences in costs and benefits are directly linked to housing tenure, while in other cases they are only indirectly influenced by housing. For example, housing tenure *directly* affects the costs associated with geographic mobility. Differences in the costs faced by economic agents are likely to shape the responses observed

⁴ It is important to emphasise that while a neoclassical approach is adopted for the purpose of this report, there are alternative 'economic approaches' to understanding the behaviours and outcomes considered in this report. In particular, neoclassical economics emphasises: the rationality of economic agents in comparing outcomes via their preferences; the maximisation of utility (profits) for individuals (firms); and agents acting independently in their own self-interest. Alternative approaches, such as institutional economics, see markets and market outcomes as a result of the complex interactions between individuals, firms, states and social norms.

⁵ Throughout the discussion, we will refer to 'economic agents' without identifying exactly the nature of the agent. In many cases, decisions are made by individuals, while in other cases, decisions are made by 'households'. Clearly, who or what the relevant economic agent is (either an individual or a household) may be an important consideration when analysing behaviour from an economic perspective. For example, in a household context, decisions may be made jointly by all adults in the household or simply by someone who is designated the 'household head'. While important, we will abstract from this distinction at this point in time.

across households in the face of adverse employment shocks, such as a spell of unemployment or underemployment. In a similar fashion, housing-related considerations may impose constraints on economic agents that shape their behaviours. For example, households that have a mortgage may face a large financial penalty if loan repayments are not maintained; faced with the prospect of repossession, such households may be more willing to accept a lower paid job in the face of an adverse employment shock.

In other instances, constraints faced by households may reflect past decisions, only some of which are directly linked to housing. Investment in human capital through education early in life generally results in individuals having a wider range of labour market opportunities available to them. This may, for example, provide an opportunity for a household to move to a region that offers superior employment opportunities. That is, the investment in education may shape decisions in both labour markets and housing markets. In a similar vein, the purchase of housing assets in the past may facilitate the accumulation of wealth that provides opportunities not available to households in rental tenures. To the extent that such wealth provides opportunities to move in the face of economic shocks, such as unemployment or a prolonged period of underemployment, the outcomes in housing and labour markets are likely to be linked.

The relationship between housing and labour market outcomes, and the economic drivers of this relationship, are of policy interest for a number of reasons. While all economic agents have an obvious need for housing services, the relationship between housing and labour market outcomes is likely to be an important determinant of the overall functioning of the economy (Zabel 2012; Blanchard and Katz 1992). Similarly, the Productivity Commission (2014b) notes that housing markets that create opportunities for adjustment are critical for a well-functioning labour market in which workers are matched with high-paying productive jobs. Such an outcome is most likely to be achieved through an appropriate mix of geographic mobility and geographic labour mobility (e.g. commuting and telecommuting). Housing-related policies such as those that impose high transaction costs on the sale of a property, or social housing policies that discourage geographic mobility, are likely to impede the achievement of an efficient outcome. The Productivity Commission notes that, '(A) well-functioning housing market is critical for labour mobility and efficient allocation of resources across the economy' (2014b: 262). Similarly, it has been argued that one of the reasons for the economic success of the US is the capacity of its residents to 'move where the jobs are' (Zabel 2012; Blanchard and Katz 1992).

The key assumption of the economic approach is that agents balance the costs and benefits of their decisions while taking into account the constraints they face. In many instances, those costs and benefits are likely to be tenure specific. Moreover, housing markets and housing policies will be an important determinant of the costs and benefits that individuals face. In Chapters 2 and 4, we more fully explore the nature of the hypothetical linkages between housing and labour markets.

1.4.2 Data

The empirical analysis in this report uses the HILDA dataset. The HILDA Survey has been used widely for studies examining behaviours within the social sciences, including economics. The HILDA Survey provides specific advantages for the analysis presented in this report for a number of reasons. First, HILDA contains detailed information at both the individual and household level. The availability of detailed socio-economic and demographic information is critical for understanding the constraints and drivers of behaviours in labour and housing markets. For example, early cross-sectional studies failed to distinguish distinct labour market states, by considering unemployment and 'not in the labour force' (NILF) simply as 'non-employment' (Winkler 2010). Further, the in-confidence HILDA dataset contains detailed geographic measures that can facilitate analysis of mobility at finer spatial levels. Importantly, the HILDA data is longitudinal in nature, which provides a number of advantages over the cross-sectional data that has commonly been used previously. The data allows for the behaviours of

economic agents over time to be examined, in addition to providing the opportunity to control for unobserved heterogeneity across agents.

The analysis of geographic mobility in Chapters 2, 3 and 6 is based on a pooled dataset of 14 waves of the combined individual file from HILDA. The longitudinal nature of the data means that it is possible to identify those individuals who are geographically mobile across consecutive waves of HILDA. Moreover, the detailed personal and labour market related information facilitates analysis of behaviours for the unemployed in Chapters 4 and 5.

Outcome variables

The statistical analysis in this report focuses on a number of behaviours and outcomes. The first behaviour of interest is geographic mobility. Our analysis considers 13 time periods where individuals and households are observed to be at risk of making a move or actually do make a move. This extensive period of data allows geographic mobility to be captured across the life course with sufficient sample numbers to draw statistically robust findings. We distinguish our analysis further by defining different types of moves. The analysis considers 'any move' as being a change in address across waves of HILDA, along with mobility across distinct spatial units. Hence, analysis is undertaken of mobility across Statistical Area Level 2 (SA2), Statistical Area Level 3 (SA3), and interstate moves. An SA2 is a spatial unit that captures a community that interacts socially and economically. There are 2,196 SA2s defined across Australia. Further, there are 333 SA3s in Australia, where each SA3 represents a group of SA2s that share similar regional characteristics (ABS 2016). The primary analysis of geographic mobility is presented in Chapters 2 and 3, though additional aspects are considered in Chapter 6, where the analysis is extended to consider joint decisions regarding job and housing mobility.

The second set of behaviours of interest are those of the unemployed; namely the level of job search intensity (Chapter 4) and the reservation wage (Chapter 5). In both cases, the variable of interest is a key component of job search models. The richness of the HILDA data provides an opportunity to consider these behaviours for a set of unemployed individuals across tenure types.

Finally, in Chapter 6 we provide some evidence on the relationship between housing tenure and labour market outcomes by considering the employment-related transitions for the unemployed and underemployed.

Independent variables and controls

Key measures of interest in this research are housing-related variables. That is, we are particularly interested in how the outcomes and behaviours identified above are associated with housing-related measures. Importantly, we construct a more nuanced tenure classification from the original tenure variable in HILDA, by combining it with other measures that allow us to distinguish between renters (private and social) and owners (with and without a mortgage). We classify owners with a mortgage by their loan-to-value ratio (LVR), derived by dividing the value of the loan repayment by the estimated value of the home. Three categories of home owners are identified: those who have an LVR of less than 0.50; those with an LVR between 0.5 and 0.8; and those with an LVR greater than 0.8. Importantly, throughout the statistical analysis, we include a set of spatial measures that are likely to have important implications for behaviours and outcomes. In general, the empirical specifications include the 'local area' unemployment rate for each year of the panel merged to the in-confidence spatial HILDA data (ABS 2016b). We also include a measure for area house prices by computing the average house value at the SA3 level. Additional details of the specifications used are set out in Chapters 2–6.

The analysis also uses a more nuanced labour classification by incorporating a measure of underemployment. Building on the International Labor Organisation (ILO) classification and as applied to HILDA by Campbell, Parkinson et al. (2014) we use a simplified measure of

underemployment, where it is defined as currently working part-time in a main job and preferring to work more hours. Underemployment, in a similar vein to unemployment, can also be measured by the additional qualification of whether an individual is available to work more hours. This additional question has been recently added to HILDA, but is not available in every wave. Therefore, whilst inclusion of such a measure of underemployment would provide a more detailed insight into underemployment, it would significantly compromise the sample size available to examine mobility, particularly across different spatial scales. Preliminary analysis with more recent waves shows that the majority of part-time employees reporting a preference to work more hours were available to do so.

Finally, a novel contribution of this research is the use of models of geographic mobility that incorporate information about the individual's attitude to risk. Respondents in the HILDA data are asked about their willingness to undertake financially risky decisions, allowing a simple binary measure of risk aversion to be created. This measure is incorporated into a series of geographic mobility models in Chapter 3.

Detailed description of the analysis undertaken is presented in Chapters 2–6, along with the appendices. In most specifications, the rich individual and contextual data that is available in HILDA is used. Hence, controls for age, gender, education level attained and immigrant status are included in the statistical specifications.

It is important to stress that the analysis in this report represents the first step in understanding the complex nature of the relationship between housing and labour market behaviours and outcomes. The statistical analysis of these relationships poses some important challenges for the researcher. Consider, for example, the impact of housing tenure on the propensity for an individual or household to exhibit geographic mobility. Ideally, to identify the *causal effect* of housing tenure, an experiment would be conducted in which individuals would be randomly allocated to different tenures. Following a labour market shock such as the loss of employment, it would be possible to identify the causal impact of housing tenure on geographic mobility by comparing the behaviours of individuals across tenures.

In general it is not possible to conduct such an experiment. Rather, the researcher is presented with data about housing tenure and labour market related behaviours, such as unemployment and geographic mobility, for a set of individuals. While statistical techniques can be applied to identify the nature of the relationship between these characteristics and behaviours, one must take caution in assigning a *causal* interpretation to the hypothesized relationship. There are a number of reasons why such caution must be exercised.

First, it is important to recognise that the relationship between geographic mobility and housing tenure is likely to be influenced by a range of factors. These might include whether the individual is unemployed, as well as their age, education and family status (Clark 2012). Indeed, one of the strengths of the HILDA dataset is that a range of these confounding effects can be incorporated into the statistical analysis. The specifications reported in Chapters 2–6 use a variety of measures of the individuals' socio-economic characteristics along with other measures (e.g. the unemployment rate) to control for such confounding effects and to isolate the relationship between housing-related variables and the outcome of interest. In effect, the estimated statistical relationship between the housing-related measure and geographic mobility is conditional on those other factors included in the empirical specification.

In addition, there are other challenges. For one, it is likely that individuals with unobservable but nonetheless important characteristics have sorted themselves into specific tenures. For example, an 'adventurous' individual who enjoys new challenges might choose a rental tenure rather than ownership, as they anticipate being geographically mobile while they take on new opportunities in the labour market. It would be incorrect to then attribute the higher propensity of such an individual to exhibit geographic mobility solely to their housing tenure; rather, it also

reflects the individual's unobserved characteristics. One benefit of using panel datasets like HILDA is that such unobserved heterogeneity can be controlled for.

A variety of approaches to modelling are available in the presence of unobserved heterogeneity.⁶ The approach adopted in much of the empirical analysis undertaken for this report is to use a random effects specification. A benefit of such an approach is that it allows time invariant characteristics such as gender to be incorporated into the statistical specifications. Nonetheless, Campbell, Parkinson et al. (2014) note that a random effects approach also has limitations, and the analysis in this report can be considered as one step in understanding the relationship between housing and labour market behaviours and outcomes.

Furthermore, there is potentially a two-way causal relationship between housing tenure and other outcomes of interest. For example, labour market behaviours are likely to affect housing tenure and, in turn, housing tenure can impact upon labour market behaviours and outcomes. The key message is that in considering the analysis presented in this report, one must be careful before attributing a causal relationship to the estimated statistical relationships. A comprehensive analysis of underlying causal relationships is beyond the scope of this report. Rather, the statistical analysis here identifies stylised patterns in the HILDA data, while taking into account some of the challenges presented by research of this nature, such as the unobserved heterogeneity described above. Significantly, the analysis is informed by the theoretical literature that argues that housing, housing markets and labour markets are closely tied. Consequently, the analysis identifies patterns in the data and provides insights into key relationships, which future analysis can more fully and more rigorously explore. Implications of the research are considered in Chapter 7.

1.5 Report structure

The remainder of this report is set out as follows. Chapter 2 is the first analytical chapter and focuses on the question of geographic mobility. In particular, we examine the likelihood that economic agents, both individuals and couples, are likely to exhibit geographic mobility across waves of HILDA. The analysis considers different types of moves in a spatial sense, and pays particular attention to the geographic mobility of unemployed and underemployed individuals. Details of the specifications used in the empirical analysis are presented in Appendix 1. While the regression analysis controls for a range of confounding factors that might influence whether or not an individual moves, the results reported in Chapter 2 focus on those factors related to housing and the labour market. We also discuss the empirical evidence around the linkage between housing and labour markets, especially as it relates to the implications of the SMH and Oswald thesis.

In Chapter 3, the focus turns to the impact of attitudes to risk on geographic mobility behaviour. There is some evidence that individuals who are more risk-averse are less likely to exhibit residential mobility. Using a novel measure of risk available in the HILDA data, we are able to estimate and report on a series of models that consider evidence that such behaviour differs across individuals in diverse tenures.

In Chapters 4 and 5, we look at job search models. In these chapters we present results from the statistical analysis of two key aspects of job search behaviour: the intensity of job search and the reservation wage of unemployed individuals. In both cases, the focus is on the role that

⁶ Campbell, Parkinson et al. (2014) canvass the issues in a housing-related context in a comprehensive and accessible manner.

housing tenure plays on the observed job search intensity and reservation wage of unemployed jobseekers.

In Chapter 6, we consider geographic mobility and labour market transitions in two ways. Initially, for those who are employed in a given wave of the HILDA dataset, we consider joint decisions around geographic and job changes. Following this, for the unemployed and the underemployed, we consider the nature of labour market transitions across waves of HILDA. In both cases, the focus of the statistical analysis is on differences in behaviours across tenure types.

Finally, in Chapter 7, we discuss the policy implications of the analysis presented in this report.

2 Housing tenure and geographic mobility

Two core theoretical perspectives, the Oswald thesis and the SMH, postulate how housing might influence labour market adjustment in the context of economic shocks such as unemployment. The Oswald thesis suggests that an economy which exhibits higher rates of home ownership will be associated with higher levels of unemployment. Home ownership, with its high transaction costs, is theorised to impede labour market adjustment by reducing geographic mobility. The SMH suggests that geographic mobility, job search and therefore labour market adjustment will be influenced by uneven aggregate housing market segments and employment opportunities that constrain interregional moves among workers with varying skills and income. The empirical evidence in the literature in support for both perspectives is mixed. There is nonetheless some important overlap between perspectives that has informed the selection of variables and interpretation of the modelling results within this report.

The statistical analysis in this chapter compares the propensity for individuals and households with different tenures to exhibit geographic mobility. The findings indicate that:

- Among all individuals, private renters exhibit the greatest propensity for geographic mobility.
- Owner-occupiers with low LVRs exhibit the lowest level of geographic mobility.
- The geographic mobility patterns of underemployed and unemployed individuals is similar, with those in private rental accommodation reporting the highest rates of mobility.
- In general there is little evidence that geographic mobility is encouraged by higher rates of unemployment in the local labour market.
- Higher local house prices and being in arrears with respect to housing costs can potentially act as ‘push factors’ and are associated with a greater propensity to report geographic mobility across time.

In this chapter, we consider the relationship between housing tenure and geographic mobility. We begin by discussing evidence around the Oswald thesis and the SMH. In both cases, a relationship between unemployment and housing tenure is hypothesised. In the case of the Oswald thesis, this relationship is driven by costs and geographic constraints associated with home ownership. To this end, we explore how patterns of labour mobility differ across tenure types. It follows that to the extent that patterns do differ across tenure types, there is potentially a role for policy in alleviating some of the transaction costs and other impediments to geographic labour mobility and the efficient functioning of the labour market.

2.1 Housing tenure and labour markets

2.1.1 The Oswald thesis

A useful starting point to consider the nature of the relationship between housing tenure and labour markets is the Oswald thesis. The Oswald thesis was originally described in a series of lectures presented by Oswald (1996) in response to the persistently high unemployment rates experienced across a range of industrialised countries. The Oswald thesis posits that the increase in the unemployment rate experienced by a range of economies beginning in the 1970s was due, at least in part, to the secular increase in home ownership and concurrent decline in private rental tenures. It is important to stress that originally the Oswald hypothesis was couched in terms of a comparison between countries, and regions within countries. The initial work suggested a significant and relatively large positive association between the level of home ownership and the unemployment rate over time—a 10 percentage point increase in the rate of home ownership led to a 2 percentage point increase in the unemployment rate (Oswald 1996). The original analysis did not, however, examine the actual behaviour of individual workers across tenures.

The Oswald thesis is prepositioned on a model of job search in which jobless workers must search for jobs and be matched with potential employers to exit unemployment. While such models are described in more detail below and in Chapter 3, for the moment it is sufficient to understand that greater or more intensive search on the part of jobless individuals is likely to raise the likelihood of a successful match and an exit from unemployment. If individuals in some form of housing tenure search less intensively, or in the event of finding a job are less likely to accept the job and ‘form a match’, the steady state rate or ‘natural rate’ of unemployment may be higher.⁷ For home owners and social renters in particular, a successful match coupled with geographic mobility may impose a heavy financial cost. The transaction costs associated with the sale of a property or the potential loss of a secure income-based rental tenure potentially increases the cost of matching with an employer. In turn, individuals or households in such tenures may be less likely to exit unemployment. Put another way, private renting facilitates geographic mobility among workers and provides greater opportunities to match worker skills and available jobs.

Oswald (1999) identifies a range of mechanisms, both direct and indirect, through which home ownership may impede geographic mobility of unemployed agents and lead to higher rates of unemployment. The direct impact of home ownership has been noted above: for home owners, moving is expensive and this added cost may mean that in the event of finding a job they are less likely to accept the offer from an employer outside the region. An indirect effect arises from the impact of high rates of home ownership on renters. Unemployed renters who are searching for employment in regions with high rates of home ownership may find it difficult to secure accommodation, leading to immobility. Further, if this immobility leads to more people commuting (and increased congestion), this increases the costs associated with employment. If these costs are greater, the incentive to work is reduced and fewer matches are made between employers and workers, leading to higher rates of unemployment in the steady state.

2.1.2 Spatial mismatch hypothesis

The SMH provides a further perspective on how housing, through spatial containment and segregation, can influence the supply of labour and access to employment opportunities. The SMH can be traced to the work of Kain (1964) and the recognition of a growing concentration or

⁷ The natural rate (or steady state rate) of unemployment can be considered as the rate of unemployment the economy fluctuates around over the course of the business cycle.

'ghettoization' of low-skilled, low-paid and unemployed African Americans in inner-city neighbourhoods in the US. This, it was argued, was related to the constraints they faced in accessing and living in the more 'job-rich white suburban' locations. A core mechanism by which the spatial mismatch was thought to occur was through the relocation of innercity jobs following mass suburbanisation, and the subsequent racial discrimination that prevented or excluded African Americans from searching in and moving to these new employment growth areas. If employment was secured, the trade-off would generally be a long commute from their inner-city neighbourhood—this in turn provided an incentive to search more locally and settle for the typically lower-paying jobs that were available in the inner-urban areas.

The focus of SMH has more recently expanded from processes of racial segregation to a concern with the spatial polarisation of opportunities and job accessibility between professional, key and lower skilled workers emerging from economic restructuring of globalised and cosmopolitan cities (Zenou 2013; Berry 2006). In the context of the Australian labour market, the SMH is typically characterised as an issue of 'spatial affordability mismatch' (Nouwelant, Crommelin et al. 2016; Berry 2006). In particular, it is characterised by a situation in which individuals with lower skills and incomes are increasingly forced to remain in and move to peripheral areas with more affordable housing, which offer fewer employment opportunities—a scenario that is particularly evident in the major cities of Sydney and Melbourne.

Although adopting a more tenure-neutral approach than the Oswald thesis, the SMH also assumes that the process of adjustment and persistence of longer term unemployment can in part be explained by housing-related labour supply constraints associated with spatial inequities, tenure and employment. Moreover, the SMH, like the Oswald thesis, can be understood in the context of theoretical models of job search and geographic mobility that vary across different housing and labour market contexts. The emphasis on the spatial containment of lower income and skilled workers in depressed regions (as higher income and skilled workers are able to relocate to better opportunities) has considerable overlap with the propositions set out in Dohmen (2005). The emergence of a potential spatial mismatch and the Oswald effect on employment outcomes both reflect, at least in part, negative externalities⁸ arising from the commuting congestion associated with the location of employment opportunities for lower skilled or entry level workers.

2.1.3 Search and matching models

The Oswald thesis and SMH provide theoretical constructs that link housing and housing markets with the outcomes experienced in labour markets. A related framework for analysing the relationship between housing tenure and labour market outcomes is provided by 'search and matching' models of the labour market. The benefit of the job search framework is that it provides insight into the mechanism at the individual level by which housing markets and labour markets are related. Moreover, it does so by focusing on the optimising behaviour of individual economic agents rather than relationships at the aggregate level.

Search and matching models posit that jobseekers undertake search activities and in the event of a successful match with a potential employer a job is formed and the unemployment spell ends. In general, an unemployed individual has the opportunity to accept a job offer at a given wage or to continue with search (Mortensen 1986). In the simplest models of job search, the unemployed individual may adjust his or her reservation wage (lowest acceptable wage) each

⁸ In economics negative externalities refer to adverse indirect or third party costs arising outside of the consumption transaction between a producer and consumer. In the context of homeownership this may include long commute times as home owners increasingly purchase properties away from the central business district or due to spatial segregation. The increased congestion and longer commute for others is an example of an externality.

period and if a wage offer is made that exceeds the reservation wage, then the offer is accepted and the spell of unemployment ends.⁹

While such a framework has been noted previously in the context of the Oswald thesis (Oswald 1996), the focus there was on the relationship between overall home ownership rates and the natural rate of unemployment. Search models are useful in that they provide a means by which the implications of tenure status and home ownership rates can be modelled on a range of labour market behaviours and outcomes at the individual or household level. It is these behaviours that are of central concern in this study. In particular, it is possible to derive predictions around outcomes, such as: the propensity for individuals to experience unemployment; the length of unemployment spells; the likelihood that households are geographically mobile; the intensity of job search activities; and the level of the reservation wage.

It is important to emphasise that the way in which tenure impacts on the labour market and related outcomes will reflect the specific set of assumptions made. Coulson and Fisher (2009) describe five variants of search and matching models that generate different implications for labour market outcomes such as wages, length of unemployment spells and length of employment. The different implications from each of the models follow from variations in assumptions about the nature of search by the unemployed, the wage-setting process and whether entry of firms (which may create employment) is allowed.

The analysis in this report is not designed to specifically test any one of the models described below. Rather, the discussion is useful as it provides motivation for the empirical analyses that are presented in this and subsequent chapters. More generally, it is important to note that while the SMH and the Oswald thesis provide useful conceptual frameworks for thinking about the relationship between housing and labour markets, search models potentially provide a rich set of insights into understanding the linkages between these markets that are relevant when considering the behaviours and outcomes experienced by individual economic agents. For example, search models highlight the costs to agents (including the costs associated with geographic mobility) as well as the benefits (in the form of employment income) associated with accepting an offer of employment.

As a starting point, consider the model posited by Oswald (1996). In this setting, there are two connected regions which experience asymmetric employment shocks. In one region, demand for labour and employment increases, whereas in the other region employment prospects deteriorate. Renters in the 'poor' region are assumed to incur limited relocation costs across regions relative to home owners. As a result, in the region that experiences a negative demand shock, home owning individuals will be forced to commute or move to the 'good' region. Wages will tend to increase in the region with good employment prospects to offset the disutility and additional costs associated with commuting or moving across regions. In equilibrium, individuals from both regions are willing to work at the going wage rate, which is the same across regions. Renters who face low or zero costs of moving will all be employed at the higher wage rate. In comparison, some home owners will remain unemployed, as the utility or satisfaction derived from working at the higher wage does not compensate for the additional cost of commuting or moving to the 'good' labour market. According to neoclassical economic theory, some home

⁹ The individual's reservation wage will be determined by a range of factors, including the availability of government support transfers while unemployed. For the unemployed in Australia, such monetary benefits are flat, continuing and do not depend on prior employment activity. In other countries, such benefits resemble an insurance program, with benefits dependent on the length of time and intensity that an individual has engaged in work prior to becoming unemployed. Moreover, such benefits are often available for only a finite length of time. Similarly, job search intensity is likely to be influenced by the availability and level of benefits received while unemployed.

owners optimise and enjoy higher utility by not working (remaining unemployed) and enjoying leisure.¹⁰ In short, home owners will be more likely to be unemployed, as renters can more easily move to the region with better employment prospects. In aggregate, a higher home ownership rate will be correlated with higher unemployment rates. In this setting, geographic mobility is less common among home owners and this group is more likely to experience unemployment.

Alternative models of job search and matching generate somewhat different results. Dohmen (2005) begins by setting out a range of stylised facts, such as the positive correlation between home ownership rates and unemployment rates that his model seeks to explain. Notably, he argues that unemployment does not need to be concentrated among home owners to explain this association. He considers a two region model in which renters can move at no cost between regions, whereas owners face transaction costs associated with moving. In this model, jobs are assumed to finish at the end of each period and new job offers arise at fixed rates in each of the regions. Unemployed home owners will only move across regions if the wage offer is sufficiently high to cover the disutility associated with working and any moving costs they experience. One of the implications of the Dohmen model is that home owners will be more likely to be unemployed at any given wage rate, as they are less likely to find a job offer in the other region acceptable. The higher wages simply do not compensate for the cost of moving (i.e. geographic mobility), so regions with higher home ownership rates will tend to have higher rates of unemployment. Given that wage offers are constant and exogenous, renter and home owner wages are constant. One important feature of the Dohmen model is the potential differences that arise between low-skilled and high-skilled workers. For example, the incentives for geographic mobility may be different among these groups, highlighting the importance of controlling for these characteristics in any empirical analysis. Isebaert, Heylen et al. (2015) also note that the Oswald effect might be more muted in regions where skills of individuals are higher.

The model of Munch, Rosholm et al. (2006) posits that unemployed individuals may receive job offers from one of two regions. The cost of moving for a home owner, however, means that, as for the Dohmen model, wage offers for jobs in other regions must be higher than for jobs in local regions for the job to be acceptable. Because job offers are assumed to arrive at a constant rate from each of the regions and are independent of tenure status, home owners will tend to reject low-paying local jobs in the expectation that eventually a high-paying non-local job offer will arise. It is possible, then, that home owners will tend to remain unemployed for longer durations compared to renters. Alternatively, if local jobs are accepted, the home owners may be unemployed for shorter durations, but the wages earned will be lower than those received by renters. Hence, home owners may experience higher unemployment and higher wages, or lower unemployment and lower wages. The former case arises when home owners hold out for acceptable non-local job offers, whereas the latter occurs when local job offers are accepted. Munch (2006) argues that either outcome is possible, depending on which effect dominates.

In later work, Coulson and Fisher (2009) develop a series of search and matching models in which firm creation or entry plays a role. In one model, home owners are constrained to search within local labour markets, and workers and firms bargain over the surplus that a successful match would generate. In such models, the better the match between the worker and employer,

¹⁰ In the neoclassical model of economics, prices (or wages in labour markets) are assumed to adjust so that markets clear. In effect, individuals can choose to be employed at the going wage rate and thus will not be involuntarily unemployed. Alternative approaches note that if markets do not adjust as envisioned in the neoclassical school, then it is likely that some individuals will experience involuntary unemployment.

the larger the potential surplus that is generated.¹¹ The models suggest that the wages of renters are higher than those of owners, in part because the geographic mobility that renters exhibit allows them to search for matches that generate higher surpluses and therefore obtain higher wages. Similarly, renters will in general experience *lower* rates of unemployment than owners. Unlike the predictions of the Oswald thesis, however, the relationship between the aggregate home ownership rate and unemployment rate is ambiguous. This follows from the fact that an increase in the home ownership rate has two offsetting effects. First, an increase in the home ownership rate tends to increase the unemployment rate because, on average, home owners experience worse unemployment levels than renters. However, because home owners also experience lower wages than renters on average, having a higher proportion of home owners in an area lowers average wages and encourages firm entry. The entry of firms into a market leads to the creation of jobs, which may in fact reduce unemployment. Hence, an important implication of this particular search model is that it is no longer the case that the linear relationship between the home ownership rate and the unemployment rate holds.

The importance of how wages are determined is highlighted by an alternative model in which wages are stipulated ('posted') rather than bargained over (Coulson and Fisher 2009). Effectively, firms make 'take-it-or-leave-it' offers to unemployed workers. Refusal of an offer means that job search continues. Renters are assumed to have higher reservation wages because the utility derived from the unemployed state is higher for this group. This assumption reflects the assumption that owners face higher costs of geographic mobility so the unemployed state generates a lower level of utility. Because owners have lower reservation wages, some job offers have lower posted wages that are acceptable to owners but not renters. Therefore, conditional on being employed, the average wage of owners is *lower* than that earned by renters. However, in this model owners experience less unemployment, in part because they are more willing to accept lower wage offers.

The Coulson and Fisher (2009) model in wages are posted has some important implications for the relationship between aggregate home ownership rates and labour market outcomes. For example, an increase in home ownership rates means that more unemployed workers find low wage offers acceptable. Firms respond by posting and filling more low-wage jobs, thereby reducing the average wage. Moreover, as home ownership rates increase, renters find the posted offers less acceptable and experience higher rates of unemployment. This increase in unemployment rates for renters has the implication that, as for the Oswald thesis, an increase in home ownership rates is associated with an increase in the aggregate unemployment rate.

The models described by Coulson and Fisher (2009) focus largely on models of job search in which workers may live in one of two or more regions. In general it is assumed that individuals can move between regions, but relative to renters it is costly for home owners to do so. A more general approach is set out by others, such as Van Ommeren, Rietveld and Nijkamp (2000) who argue that job mobility, residential mobility and commuting distance are mutually dependent. As such, they develop a model that incorporates search in both the housing and labour markets, with offers arriving randomly and independently in each market. Acceptance of an offer in either the housing or labour markets will have implications for commuting, which in turn influences search behaviour in the other market.

In a theoretical or conceptual sense, the discussion above makes clear that the implications of tenure for labour market outcomes will be sensitive to the specification of the model. In particular, assumptions around the following variables are all likely to influence the theoretical predictions of the model: job search costs across tenures; the wage determination process (i.e.

¹¹ The general approach is to adopt the Nash bargaining framework, in which each party to the bargain (the firm and the worker) receive one-half of the net surplus.

whether wages are posted or bargaining occurs between agents); and whether job offers arrive at an exogenously determined rate or are influenced by the search effort of individuals. Indeed, the ability to incorporate alternative assumptions explicitly into models of economic behaviour represents an underlying strength of this approach. In all cases, the economic approach assumes that economic agents weigh up the costs and benefits associated with alternate actions and in turn make utility maximising choices.

Empirical analysis of models such as these generally requires a rich dataset that contains detailed information on housing and labour market outcomes and behaviours, along with detailed socio-economic data. The HILDA dataset used in this report does contain detailed information over these dimensions for a panel of individuals and households over time. Nonetheless, the approach adopted in this report is not to specify one particular model and test the veracity or predictions of that model. Rather, the analysis will examine how tenure may impact on various labour market outcomes identified in the job search and matching models described above. In particular, outcomes and behaviours including geographic mobility, reservation wages and job search intensity are examined to determine how they are associated, if at all, with tenure status.

Following the work of Oswald (1996; 1999), the empirical analysis tended to focus on the impact of home ownership on the aggregate level of unemployment. Flatau, Forbes et al. (2002a; 2002b) note that broader macro-economic considerations might also be important for understanding how tenure impacts on labour market performance. In particular, housing tenure and labour market outcomes may be linked via business cycle considerations. Consider, for example, a negative shock to aggregate demand that leaves some households with negative equity if demand for housing falls. Labour mobility may in turn be impeded as a result of the lock-in effects experienced by highly leveraged households (Henley 1998). In the United Kingdom (UK), clauses prohibiting the resale of council houses by former public housing tenants led to a particularly acute form of lock-in (Henley 1998). Similarly, Sterk (2015) argues that a decline in house prices will itself causes unemployment to rise because of the lock-in affect associated with the need for a deposit or down-payment on new home purchases. In turn, this increase in unemployment may feed back into house prices, decreasing them further.

Such macro-economic considerations could be considered in a more wide-ranging analysis. In this report, the focus will be on the micro-economic relationships of interest and the outcomes and behaviours experienced by individual economic agents.

2.1.4 Empirical evidence

Following Oswald's initial analysis (1996; 1999), researchers focused on whether the relationship between increases in aggregate rates of home ownership and the natural rate of unemployment could be empirically validated across jurisdictions and over the business cycle. Initially, empirical analyses focused on relationships at the aggregate level, though more recently the micro-economic implications of the Oswald thesis for labour market behaviours and outcomes has been examined. In the latter case, studies have relied on survey data to examine whether home ownership increases the duration of unemployment spells, the intensity of job search, the propensity to move in search of employment, and/or impacts upon an individual's reservation wage. Such studies typically frame their analysis within the theoretical models of job search and geographic mobility in order to better articulate the sets of behaviours and mechanisms that may underpin aggregate relationships between home ownership and unemployment.

Macro-economic studies examining the relationship between home ownership and unemployment typically draw on census or other aggregate data. Such analyses generally focus on the relationship between variables such as the home ownership rate, the unemployment rate, and geographic mobility at the state or more local spatial scales. More recent studies have

incorporated fixed effects on pooled data, additional variables including the composition of skills in an area, and lagged dependant and instrumental variables to provide more robust estimates of the relationship between housing tenure and unemployment.

The general consensus emerging from the findings of macro studies is that there is a significant association between rates of home ownership and rates of unemployment—albeit typically less pronounced than that identified in the original analysis reported in Oswald (1996). The initial empirical analysis from which the Oswald thesis emerged used relatively simple econometric techniques to find that a 10 percentage point increase in home ownership rates was associated with a 2 percentage point increase in the rate of unemployment (Oswald 1996; 1999). The analysis indicated a robust relationship across regions and countries, and over the various time periods examined. Subsequent analysis by Partridge and Rickman (1997) likewise showed a correlation between higher rates of home ownership and unemployment across states in the US. Pehkonen (1999) also found empirical support for the Oswald thesis using regional data for Finland, though the magnitude of the effect is around one-half of that identified in Oswald (1996).

The strong and somewhat discouraging predictions of the Oswald thesis were cast into doubt by Green and Hendershott (2001b) who revisited the analysis of Oswald for the US and found little evidence that home ownership and unemployment are correlated with one another. In particular, in that study, state-level data is used to examine the *change* in unemployment rates and home ownership over the period 1970–90. Green and Hendershott argue that the positive relationship identified by Oswald (1996; 1999) largely disappears once the relative size of states in the US is accounted for, along with the ageing of the population. To the extent that the relationship does hold, it appears to be strongest for middle-aged household heads, for whom the transaction cost of owning is large relative to the cost of not finding employment.

Evidence for Australia is provided in Flatau, Forbes et al. (2002a), where a mix of aggregate and individual-level data for the period 1986–96 are analysed with somewhat inconclusive results. One significant finding of the analysis is the importance of controlling for alternative tenure types beyond a simple owner/renter distinction. The analysis distinguishes five alternative tenure types, including owner-mortgagor and outright owner, and finds somewhat different relationships across tenure types. Using a simple model similar to that employed by Oswald, a negative relationship between the levels of home ownership and unemployment is identified. To the extent that some empirical specifications provide some evidence that is consistent with the Oswald thesis, the effects are markedly smaller in magnitude compared to the original analysis (Flatau, Forbes et al. 2002a).

An alternative approach that considers the aggregate relationships between housing and labour markets is developed in Head and Lloyd-Ellis (2012). In that paper, they develop a macro-economic model with heterogeneous locations, and, construction of housing that is determined endogenously within the model so that house prices are not assumed fixed, but rather are determined within the theoretical framework. The model also incorporates search frictions in the housing and labour markets. For example, if liquidity constraints exist in housing markets (so it takes time for housing assets to be transferred), home owners may be forced to turn down job offers, leading to unemployment. Hence, home owners are more likely to experience unemployment than otherwise equivalent renters. While Head and Lloyd-Ellis identify a pattern consistent with the Oswald thesis—namely a positive relationship between the home ownership rate and the unemployment rate within regions—the magnitude is somewhat smaller than that identified in Oswald (1996), assuming reasonable parameters for the model.

In more recent analysis, Blanchflower and Oswald (2013) revisit the relationship between home ownership rates and the level of unemployment in the US using a panel of state-level data. The approach adopts an autoregressive framework, effectively arguing that the relationship between home ownership and unemployment is not concurrent but rather occurs with a lag. The

empirical approach uses the natural logarithm of the unemployment rate in state in time (t) as a dependent variable and includes the previous rate of home ownership in the state ($t-3$ and earlier) as an explanatory variable. The results suggest that doubling the rate of home ownership in a state would in turn contribute to a doubling of the rate of unemployment.

Importantly, Blanchflower and Oswald also find that areas with higher rates of home ownership have lower levels of geographic mobility, longer commuting times to work and lower rates of business formation. These findings are particularly pertinent in light of the conceptual discussion above, which highlighted the various mediating mechanisms via which housing tenure impacts on the labour market and related outcomes. This highlights one important consideration around the potential negative externalities or 'spillover' effects of home ownership. That is, high rates of home ownership may create 'inhibiting externalities' on the labour market above and beyond any impact on individual home owners. An important consequence of this is that home owners do not need to exhibit higher rates of unemployment compared with other tenures for there to be a causal relationship stemming from home ownership. Negative externalities include: congestion caused by home owners having to commute to business centres; fewer new businesses locating in an area due to residents' aversion to development, or so called NIMBY (not in my backyard) effects; and informational externalities that arise due to a lack of geographic mobility on the part of home owners. Informational externalities occur when highly productive and geographically mobile workers improve the productivity of co-workers. While a key challenge in identifying these causal pathways is the long-term nature of any employment or housing relationship, Blanchflower and Oswald conclude that the consequences from negative externalities require further exploration.

Recent research by Isebaert, Heylen and Smolders (2015) also adopts an aggregate approach, but relies on relatively small spatial units for analysis. Specifically, they analyse 42 districts or *arrondissements* in Belgium, with an average size of 723 square kilometres and a population of around 215,000. Time series information from 1970–2005 allows fixed effects models with instrumental variables for home ownership to be estimated. The authors identify a significant positive relationship between home ownership and unemployment, observing that a 1 per cent rise in the rate of home ownership in a district implies a fall in the employment rate of about 0.35 percentage points. Further, they find that the effect is much smaller in districts with higher skilled labour, suggesting a more nuanced relationship exists between home ownership, skills, area, labour supply and employment outcomes. Isebaert, Heylen and Smolders argue that the observed positive relationship between unemployment and home ownership at the aggregate level reflects the negative externalities identified by Blanchflower and Oswald (2013).

While informative, the macro-economic studies are characterised by a number of limitations. Key limitations plaguing many macro studies include: the failure to control for unobserved effects; ignoring issues of endogeneity or reverse causation associated with selection effects into home ownership; and relying on a small number of control variables at the aggregate level.¹² For these reasons, more recent investigations into the relationship between housing tenure and unemployment have tended to rely on micro-economic analysis.

¹² Selection effects refer to the fact that individuals who are observed to be in home ownership have not been randomly allocated to that state. Instead, they have chosen that form of tenure so their observed tenure reflects a choice that they have made. This may reflect unobserved characteristics of the individual such as a preference for security of tenure, or some other outcome such as a steady job that facilitates the purchase of a home. If this non-random allocation of individuals to different forms of tenure is not taken account of when undertaking statistical analysis, it is difficult to identify the causal impact of tenure on outcomes of interest

2.1.5 Untangling the Oswald effect using micro-economic data

Early micro-economic studies reveal the potentially ambiguous effect that housing tenure may have on outcomes related to unemployment, which has led to 'paradoxical' findings that typically do not support the initial propositions of the Oswald thesis and empirical observations in macro-economic data. Owning a home can trigger any number of economic and non-economic behaviours, which are contingent upon such things as the timing of purchase, mortgage costs, household make-up and social attachments to local areas. For example, Goss and Phillips (1997) argue that mortgage commitments may effectively constrain home owners in a manner that leads to heightened job search intensity and thereby hastens the exit from unemployment. Conversely, they note that those with large equity holdings can potentially draw on accumulated wealth to fund a prolonged spell of job search. Indeed, an important development over the past two to three decades has been the increasing consumption of housing wealth through home-equity withdrawal (Ong, Jefferson et al. 2013; Schwartz, Hampton et al. 2010).

Home ownership may also have indirect effects on spells in unemployment. For example, the greater commitment of home owners to the local community may provide them with informal networks that facilitate entry into employment. Home ownership might also signal characteristics that potential employers see as desirable, such as work diligence and commitment, which in turn may lead to better job offers and a shorter spell of unemployment for owner-occupiers.

The availability of longitudinal data has facilitated the analysis of length of unemployment spells and the impact of housing tenure on this aspect of labour market behaviour. While potentially providing useful insight into impacts of housing tenure on underlying behaviours, it is important to note that any behavioural responses are likely to be quite nuanced. For example, early micro-economic studies assumed that if an Oswald effect existed, home owners, both outright owners and mortgagors, would have longer durations of unemployment than renters due to impediments to geographic mobility and transaction costs. Subsequent analyses have recognised that transaction costs and the ability to fund job search activities may differ across households and individuals with varying levels of home equity.

In general, where analysis has been undertaken using microdata, the approach has been to examine the length of spells in various labour market states, such as unemployment, using a hazard function approach or duration analysis. Among the first micro-economic studies, Goss and Phillips (1997) used the American Panel Study of Income Dynamics (PSID) and found that contrary to the Oswald thesis, owner-occupiers experienced shorter spells of unemployment. Moreover, this finding was robust, after controlling for self-selection into home ownership. There is some evidence that the shorter spells of unemployment reflect the constraints imposed by mortgage repayments.

More recent evidence for the US is provided by Coulson and Fisher (2002). Analysis of census and PSID data indicates that home owners have lower rates of unemployment and exhibit shorter spells of unemployment than renters, *ceteris paribus*. Coulson and Fisher argue that one possible reason for the results is related to the 'selection effect' associated with tenure choice, which was not considered in the analysis. That is, home owners are aware of their high transaction costs and thus enter home ownership only when their employment prospects are relatively strong. Subsequent analysis by Coulson and Fisher (2009) also finds that home owners are *less* likely to be unemployed compared to renters.

Micro-economic evidence for Australia is reported in Flatau, Forbes et al. (2002b), where repeated cross sections from the Survey of Income and Housing Costs (SIHC) are analysed. In contrast to the predictions of the Oswald thesis, the analysis finds that home owners have significantly quicker exits from unemployment. They do find, however, that home owners are significantly more likely to experience long-term unemployment. Similarly, Munch, Rosholm et al. (2006) find a negative correlation between home ownership and unemployment duration for

Danish workers. Importantly, their analysis makes a distinction between exits within local and non-local labour markets, finding that home owners typically take up jobs in the local region rather than those outside the local labour market that may require a geographic move. The choice is characterised as one between residential mobility versus commuting to local jobs that are potentially not as convenient or offer lower wages. In a similar vein, Van Vuuren (2009) argues that relative to renters, owners will typically search for and obtain jobs within local regions.

Additional insight into the relationship between tenure and unemployment spells is provided in Brunet and Lesueur (2009) and Baert, Heylen et al. (2014). In the former study, analysis of spells in unemployment among the unemployed in France finds support for the Oswald hypothesis. In particular, there is a positive and statistically significant relationship between home ownership and the duration of unemployment spells. For Belgium, Baert, Heylen et al. use a hazard model to assess the impact of home ownership on unemployment spells, distinguishing between outright owners and those with a mortgage. Importantly, they also control for the potential endogeneity of tenure status using the percentage of home owners in an area as an instrument variable.¹³ While similar to the approach described in Munch, Rosholm et al. (2006; 2008), some have argued that it represents a poor instrument (Coulsen and Fisher 2009). Munch, Rosholm et al. use an additional instrumental variable, namely the relative price of purchasing at the time the house was bought. The analysis finds evidence that outright owners remain unemployed the longest, followed by renters and then mortgagors. This pattern is attributed to lower job search intensity on the part of outright owners, as a result of the lack of a requirement to pay rent or meet mortgage repayments.

One important consideration that in general is not examined in aggregate studies, other than in a very coarse manner, is different behaviours across tenure types. Battu, Ma and Phimester (2008) distinguish between private and social housing renters when examining spells in employment and unemployment in the UK using the British Household Panel Survey (BHPS). They adopt a competing risk approach, comparing exits/transitions from employment (or unemployment) into local jobs and non-local jobs (which do not and do require a residential move, respectively). They consider the duration of spells in a labour market state, such as employment or unemployment, until a transition occurs. Such a transition may take a number of forms, as the individual may find employment (if unemployed), may transfer from one job to another, or may exit the labour force (if employed or unemployed).

Ignoring any unobserved heterogeneity and tenure endogeneity, the analysis in Battu, Ma and Phimester indicates that unemployed home owners are more likely to transition into local jobs and less likely to transition into jobs that require a residential move. After controlling for unobserved heterogeneity across individuals and the potential endogeneity associated with tenure choice, the effect of home ownership on transitions out of unemployment are substantially more muted. The results for social housing renters are more robust and indicate that they are 'spatially constrained'; being less likely to enter employment when it involves a residential move compared to private renters. Moreover, there is no positive effect of tenure status on the likelihood of transitions into local employment for social housing renters. The analysis of employment durations suggests that, compared to private renters, home owners are less likely to exit from employment into another job which requires a non-local move. This is

¹³ The problem of endogeneity arises because whether the individual resides in owner-occupied housing is also likely to be influenced by the length of the unemployment spell. That is, the two outcomes (tenure and unemployment duration) are likely to be jointly determined. Failing to take account of the endogeneity will lead to incorrect estimates of the impact of tenure on unemployment spells. One common method to address the problem of endogeneity is to use an instrumental variable approach. An instrument should affect the outcome of interest (the duration of unemployment) only indirectly through its direct impact on the endogenous variable (tenure status).

consistent with evidence of home owners setting higher reservation wages for jobs that entail a residential move. Notably, the Australian analysis reported in Flatau, Forbes et al. (2002b) also highlights the importance of controlling for different types of tenure, along with distinguishing between outright owners and those with a mortgage.

The analyses to date suggest that at neither the macro- nor the micro-economic levels is there a strong consensus around the Oswald thesis. Rouwendal and Nijkamp (2010) argue that part of the inconsistency in findings across studies to date stems from the limited theoretical specificity underpinning Oswald's initial proposition, and the subsequent assumptions that the job search and geographic mobility behaviour of mortgagors and outright owners should be similar.

Rouwendal and Nijkamp present a richer model in which housing enters the decision-making process through a variety of pathways, including those related to housing costs (h), the utility of ownership (A), and the cost of moving (M). They argue that their model is consistent with Oswald's by predicting that home owners will have higher moving costs that result in lower job search intensity, leading to a longer duration of unemployment. However, when an unemployed home owner's 'marginal utility of non-housing consumption is higher than that of otherwise comparable tenants' (p. 429) (i.e. when the housing costs of the home owner are higher relative to private renters), the incentive to search more intensely for work is increased, thereby overriding higher mobility costs and constraints, and encouraging faster exit from unemployment.

One benefit of using microdata to analyse the relationship between housing tenure and labour market behaviours and outcomes is that detailed information on decision makers can be incorporated into empirical models. For example, while much analysis occurs at the individual level, it is likely that decisions around geographic mobility and job search behaviour are made in the context of relationships that occur at the household level. Hence, household structure is likely to be a particularly important consideration in regards to decisions around mobility, commuting and search intensity when looking at multi-person households.

Van Ommeren (2000) argues that two-earner households may search less intensively in the housing market and more intensively in the labour market the longer is the distance *between* the individuals' workplaces. Intuitively, search in the labour market may lead to an offer that reduces commuting times for the individual but does not impact on the commuting time for the other household member. This hypothesis is considered by examining the behaviour of individuals in Dutch households. The empirical analysis does not, however, indicate additional search intensity in this instance, though the individual's own search intensity is positively related to their own commuting time. Given that, traditionally, females have taken the place of secondary earners in households, gender differences in a household context may be particularly important considerations when examining the relationship between housing and labour market outcomes. To date, such differences have remained largely unexplored in the empirical literature.

2.1.6 Geographic mobility

In the empirical results reported in Sections 2.2 to 2.4, we consider one aspect of the relationship between housing tenure and labour markets by focusing on the issue of geographic mobility. At one level, the Oswald thesis posits that poorer labour market outcomes are likely to be associated with higher home ownership rates because of the costs associated with geographic mobility that are experienced by home owners. Some evidence around geographic labour mobility for Australia is presented in a recent report by the Productivity Commission (2014b). Geographic mobility or relocation, defined as a move of residences, is relatively common in Australia. Around 16 per cent of people in the labour force move in any given year. Some individuals and households move multiple times, so that over a five-year window, about 40 per cent of the working population report changing residences (p. 102).

Böheim and Taylor (2002) describe how the decision of an economic agent to relocate can be characterised in an economic framework. As described previously, economic agents compare the costs and benefits associated with geographic mobility. The current set of circumstances an agent faces will generate a level of utility that reflects a range of considerations, including outcomes in the housing and labour markets. Current circumstances might, for example, be characterised by limited employment opportunities but a high level of housing amenities. The limited employment opportunities could mean that an individual receives a relatively low wage, or earns a high wage only by commuting long distances. The agent is likely, however, to have a range of choices available. While they may move to an area that offers better employment opportunities but potentially higher housing costs, this may be partly offset by a lower commuting time. Any move is itself likely to be costly, both in a financial sense but also in a psychological sense, as neighbourhood networks are likely to be lost if the move is relatively long distance.

Whether or not a move is actually observed will depend on the expected level of utility associated with moving versus staying, taking account of the direct and indirect costs of moving. In effect, if there is a net gain in utility from moving from the present location to an alternative location, then mobility is likely to be observed. Of course, in such a framework there are a number of considerations, including the uncertainty associated with future outcomes. Notwithstanding such complications, the neoclassical economic approach posits that geographic mobility will be observed if there is an expected net gain in utility for the household.

Considerations of labour and geographic mobility in Australia are dominated by the large distances that moves might entail. A move across states within Australia might equate to a move across countries in many parts of Europe. Moreover, the population is largely concentrated in coastal areas, especially across the eastern seaboard. In a geographic sense, Australia is most similar to Canada and the US, and comparisons with those countries are particularly pertinent. Using data from the Organization for Economic Cooperation and Development (OECD), the Productivity Commission reports that in the early 2000s the likelihood that individuals were to report that they changed residence was lower in Australia than in the US, and similar to Canada (2014b: 119–120). In general, geographic mobility rates are higher in Australia than European countries, including Great Britain.

In most cases, moves in Australia are short (less than 10 kilometres) and are not likely to have significant implications in terms of labour market outcomes and behaviours. Moreover, most short moves are unlikely to be driven by labour market considerations. When defined in a manner that is relevant for labour market considerations, moves are far less common. Using the Australian Bureau of Statistics (ABS) definition of regional labour market, only around one-fifth of residential moves in any given year involved a move to a different labour market. Interstate moves are less common again, with around 1.5 per cent of those in the labour market reporting an interstate move in any given year.

Existing evidence suggests that geographic mobility in Australia is driven by a range of considerations and labour market considerations are simply one factor driving behaviours. In terms of why moves occur, it is useful to consider who moves, as this potentially sheds light on the motivations that drive mobility. The Productivity Commission notes that certain groups—including younger Australians, the unemployed, Indigenous Australians, recent migrants, singles, females without children, educated and skilled people, and workers in some industries (e.g. mining)—are more likely to move across labour markets. In many cases, it is likely that such moves are driven by the prospect of better economic opportunities in expanding labour markets. In other cases, relatively poorly performing regions may offer lower costs of living and prove attractive to potential movers (Productivity Commission 2014b: 147). The Productivity Commission notes that individuals who move tend to cite a variety of reasons for doing so. Moreover, the reasons differ according to the type of move recorded. Based on data from the

HILDA Survey, those who move shorter distances (less than 30 kilometres) cite neighbourhood and family considerations as being important. In comparison, longer moves are more likely to be associated with work and lifestyle considerations (p. 116).

Of key interest in this report is the relationship between housing tenure, labour markets and geographic mobility. With respect to housing tenure, the Productivity Commission notes that:

People who rent privately are more likely to move residence than home owners, and .. renters are more likely to move for employment reasons than home owners. People in public housing have the lowest rates of residential mobility. (2014b: 13–14)

There are various reasons why such patterns may be observed in light of the incentives faced by households residing across different tenures.

For those who face adverse labour market shocks, geographic mobility provides an opportunity to move to regions with better employment prospects. The Productivity Commission (2014b) notes that the evidence around this issue is somewhat ambiguous. While there is evidence that unemployed people are more mobile than the employed, the nature of the unemployment and the characteristics of individuals are also important for understanding the nature of mobility. For example, for those unemployed for more than 12 months, or the long-term unemployed, short-distance moves are common; possibly reflecting challenges around securing and maintaining stable accommodation. For the unemployed, long-distance moves potentially pose more significant challenges, because of problems associated with transport and lack of social networks. Moreover, those who do move tend to spend less time on income support—though this reflects the characteristics of the individual rather than the impact of the move. Additionally, it is not clear that geographic mobility is a facilitator of improved labour outcomes. There is some evidence, for example, that moves by the unemployed are associated with a desire to move to areas with lower costs of living rather than improved labour market prospects. In this context, the availability of affordable housing is likely to be an important consideration in the decision to move and where to move to (Bradbury and Chalmers 2003).

Operationalising the economic model in an empirical sense does provide challenges. Consider, for example, the analysis of geographic mobility and its relationship to observed labour market outcomes. Boman (2012) notes that in examining mobility, unobserved characteristics pose a challenge. It is not clear that those who move are in fact better off because they moved, or if they moved as a result of some unobserved characteristic, such as motivation, which makes the success of a move far more likely. In an analysis of the outcomes experienced by individuals in Sweden that move from one location to another, there is evidence that, compared to non-movers, movers have unobservable characteristics that are associated with more favourable labour market outcomes (Boman 2012). A related issue concerns *why* geographic mobility is observed. It may be the case that it is *perceived* as opposed to *actual* employment opportunities that drive mobility. In this case, enhanced employment outcomes do not represent the effects of mobility so much as the causes of mobility.

Early analysis of the impact of housing tenure on geographic mobility is described in Hughes and McCormick (1981). Motivated in part by the one-third of households in the UK which at that time occupied council houses, their results suggest that households in such tenures are significantly less likely to move *across regions* in the UK compared to owner-occupiers and private renters.

Böheim and Taylor (2002) examine the relationship between housing tenure, residential mobility and labour market outcomes for Britain in the early 1990s. Using the BHPS, they identify that while the unemployed account for a relatively small proportion of all movers, they are more likely to move compared to an employed individual (*ceteris paribus*). Mobility does, however, tend to fall as unemployment duration increases. They also find that mortgage holders have relatively lower rates of geographic mobility compared to those in public or private renting, as well as

those who own their property outright. This may reflect the relative depressed house market in Britain during this period, as many households experienced negative equity following declines in nominal house prices. It is noteworthy that among owner-occupiers who moved, over 20 per cent moved into a rental tenure. Interestingly, a stated desire or preference to move for employment reasons is highly correlated with actual mobility. Like the empirical analysis in this report, the analysis in Böheim and Taylor uses a range of methodologies, including random effects probits to control for unobserved heterogeneity, and distinguishes between long-distance and short-distance (inter- and intra-regional) moves. Joint analysis of the decision to move residences and jobs indicates that unobserved characteristics that increase the likelihood of residential mobility also increase the likelihood of job (employment) mobility.

When considering geographic mobility, the cost of housing is likely to be an important consideration (Antolin and Bover 1997). Cannari, Nucci et al. (2000) examine evidence for Italy, noting that internal migration at the time had declined, despite increasing divergence in the economic performance of the relatively prosperous north. Housing costs, it is argued, are likely to be important in assessing the costs and benefits associated with a geographical move and are not always captured by measures of consumer prices. Using aggregate measures of mobility across regions, the empirical evidence supports the proposition that the north–south housing price differential is an important factor in explaining the falling patterns of geographic mobility over time.

The role of house price differentials is also considered by Henley (1998). The analysis in that paper examines the mobility of home owners in the UK during a period when as many as 20 per cent were experiencing negative equity, following large declines in nominal house prices during the late 1980s. Such a situation may impede residential mobility and thereby negatively impact on labour market outcomes for a variety of reasons. Widespread falls in house prices may mean that some households are faced with 'over-consumption' of housing, as the ability to downsize or move to alternative tenures is not viable. This may have direct implications for the labour market if the matching process becomes less efficient. Using a series of duration models, Henley finds that having negative equity significantly reduces the likelihood that owner-occupied households exhibit geographic mobility.

In a similar vein to Henley, Chan (2001) uses a hazard rate framework and shows that households characterised by high LVRs in the New York, New Jersey and Connecticut regions in the early 1990s exhibited substantially lower rates of geographic mobility, possibly reflecting spatial lock-in. Moreover, Chan reports asymmetric effects to changes in house prices: while increases in house prices tend to reduce geographic mobility, possibly in response to improved local economic conditions, decreases in house prices also reduce mobility, possibly reflecting loss-aversion on the part of potential sellers. Analysis by Genesove and Mayer (1997; 2001) highlights the impact of high LVRs on reservation prices and selling times for condominiums in Boston, a pattern consistent with a spatial lock-in and loss-aversion effect, as identified by Chan. Ferreira, Gyourko and Tracy (2010) likewise find that negative equity reduces the likelihood that households exhibit geographic mobility. Together, these analyses serve to highlight the potentially important role that equity levels can play on the mobility of owner-occupiers. The empirical analysis in this report addresses this by including information on equity levels into the empirical specifications.

Quigley (1987) argues that spatial lock-in might result from institutional arrangements associated with the terms of mortgages, rather than the LVR itself. In particular, households in the US with fixed rate mortgages may be constrained if, as a result of a move, a new mortgage at a higher market rate of interest was to be taken on. The analysis in Quigley suggests that there may be strong lock-in effects for owner-occupiers with mortgages during periods when interest rates are rising. Such patterns are unlikely to be as pronounced in Australia, where

households tend to have variable interest rate mortgages, or fixed interest rate terms of substantially shorter durations.

More recent evidence on the influence of housing tenure on geographic mobility is provided by Farber (2012). By focusing on the behaviour of American jobseekers in the period after the GFC, Farber is able to explore how changes in housing equity arising from wide-spread price declines impacted on the mobility of unemployed workers. An important feature of the analysis is the variation in economic circumstances arising from house price declines following the GFC that he is able to exploit. Arguably, any potential 'lock-in' effects associated with home ownership in this instance is exogenous to the decisions of the home owner. While noting the generally high geographic mobility of job-losers in the face of deteriorating labour markets in the pre-GFC period, Farber finds that in the post-GFC environment, home owning job-losers in fact became *more* mobile relative to those in rental tenures. Although renters tend to be more mobile than home owners, the post-GFC experience suggests that deteriorating house markets *do not* inhibit adjustment by owners following the loss of employment.

In Sections 2.2 to 2.4, we present the results from the analysis of geographic mobility. In addition to analysis of moves defined by their spatial nature, the behaviours of different groups are also analysed. For example, the geographic mobility of unemployed and underemployed individuals is considered in Section 2.3. These groups are of particular interest from a policy perspective. In all cases, the results presented focus on the role of housing tenure and housing-related variables. Full details of the specification used and the full set of results are presented in Appendix 2.

2.2 Geographic mobility among individuals

The specifications reported in Table 1 examine the geographic mobility of all individuals in households aged 25 and above across waves of HILDA. Summary statistics for the pooled cross section used in the analysis in this chapter are presented in Appendix 1. In these specifications, mobility is defined as a change in address across consecutive waves of HILDA between period t and $(t+1)$. That is, no distinction is made between short-distance or long-distance geographic moves, so all moves are defined as representing geographic mobility and termed 'any move'. Subsequent analyses reported in Table 2 consider cross-region moves separately. Note that the specifications in Table 1 successively add additional housing-related information and variables to the specification. This additional information reflects the key themes identified in the literature. For example, the literature highlights how owners are not a homogeneous group, so a distinction is made between outright owners and those with a mortgage. Moreover, information on the level of indebtedness in the form of the LVR is included in some specifications. Specification (1) has five types of tenure: outright home ownership, ownership with a mortgage, private rental, public housing and rent-free tenure. In specification (2) additional information on mortgagors is included by incorporating information on the self-reported LVR of home owners. Three such categories are identified: those with a LVR greater than 0.8, those with a LVR between 0.5 and 0.8, and those with a LVR between 0 and 0.5. Subsequent specifications include additional information about the individual's own housing situation, along with the level of house prices in the local area in which they reside. Information on other contextual variables, in particular the unemployment rate in the local labour market region, is also included in the specifications.

The results of the statistical analysis are largely consistent with a priori expectations. In specification (1), for example, owner-occupiers with a mortgage are the least likely to report moving across waves of HILDA, while those in private rental tenures are the most likely to exhibit geographic mobility. The marginal effects indicate that private renters are approximately 15 percentage points more likely to report moving. Social renters are more likely to move compared to outright owners (marginal effect of 3.5 percentage points), while owner-occupiers

with a mortgage are slightly less likely to report moving. In specification (2), those residing in a household with a mortgage are further disaggregated by the level of the LVR. This analysis indicates that it is those with a high LVR (greater than 0.8) along with those with a low LVR (less than 0.5) who report being the least likely to move. The relationship between housing tenure and geographic mobility is generally consistent across specifications. Notably, however, the coefficients on the owner-occupiers become insignificant when actual housing costs are included in the model (specification 6). The coefficient on this is negative and suggests that an *increase* in the individual's housing costs is associated with a *decrease* in the probability of moving. Geographic mobility is also related to other housing-related measures. Higher local area housing costs, measured at the SA3 level, are associated with an increase in the likelihood of moving, as is being in arrears on housing costs in the previous year.

The specifications reported in Table 1 also include a range of individual and local area characteristics that are likely to influence mobility decisions. The regressions indicate that the local unemployment rate is positively related to geographic mobility, albeit in a statistically insignificant manner. The unemployment rate included in the specification is measured at the SA3 level and is merged into the confidentialised HILDA dataset using appropriate geographic identifiers. In this way, a more localised measure of the health of the labour market is included in the empirical specifications. Measures of the individual's labour force status suggest that in general it is the unemployed who are more likely to move across waves, though in specifications (5) and (6) the coefficient is statistically insignificant. Notably, there is no evidence that the underemployed are more or less likely to move relative to the omitted category group of full-time employed individuals.

The results of the statistical analysis reported in Table 1 do not distinguish between different types of geographic mobility for the individuals. To assess different types of spatial moves, in Table 2 results from a second series of models for individuals are reported using specification (6) from Table 1.

Table 1: Geographic mobility among individuals

	(1)	(2)	(3)	(4)	(5)	(6)
Owner with mortgage	-0.011*** (0.003)	-	-	-	-	-
LVR <0.5	-	-0.012*** (0.004)	-0.012*** (0.004)	-0.0123*** (0.004)	-0.012** (0.004)	-0.007 (0.004)
LVR >=0.5 & <0.8	-	-0.005 (0.004)	-0.005 (0.004)	-0.005 (0.004)	-0.006 (0.004)	0.001 (0.005)
LVR >=0.8	-	-0.015** (0.005)	-0.015** (0.005)	-0.0146** (0.005)	-0.015** (0.005)	-0.007 (0.006)
Private renters	0.154*** (0.004)	0.154*** (0.004)	0.153*** (0.004)	0.153*** (0.004)	0.150*** (0.004)	0.154*** (0.004)
Social renters	0.035*** (0.006)	0.035*** (0.006)	0.033*** (0.006)	0.033*** (0.006)	0.033*** (0.007)	0.036*** (0.007)
Rent-free	0.124*** (0.006)	0.124*** (0.006)	0.124*** (0.006)	0.124*** (0.006)	0.122*** (0.006)	0.122*** (0.006)
Years at address	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.004)	-0.003*** (0.000)	-0.003*** (0.000)
Employed part-time	-0.008* (0.003)	-0.008* (0.003)	-0.008* (0.003)	-0.008* (0.000)	-0.006 (0.003)	-0.006 (0.003)
Unemployed	0.0155** (0.006)	0.016** (0.006)	0.016** (0.006)	0.016** (0.001)	0.009 (0.006)	0.010 (0.006)
NLF marginally attached	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.003)	-0.005 (0.005)	-0.005 (0.005)
NLF not marginally attached	-0.005 (0.004)	-0.006 (0.004)	-0.006 (0.004)	-0.005 (0.006)	-0.004 (0.004)	-0.004 (0.004)
Underemployed	-0.000 (0.004)	0.000 (0.004)	0.0006 (0.004)	0.000 (0.005)	-0.002 (0.004)	-0.002 (0.004)
Average area (SA3) house value/10,000	-	-	0.001 (0.000)	0.001 (0.000)	0.002** (0.000)	0.002** (0.000)
Area (SA3) unemployment rate	-	-	-	0.001 (0.005)	0.001 (0.000)	0.001 (0.000)
Couldn't pay rent/mortgage	-	-	-	-	0.009* (0.004)	0.009* (0.004)
Monthly housing costs/100	-	-	-	-	-	-0.000** (0.000)
Wald Chi ²	10121.55***	10124.75***	10054.94***	10056.80***	8835.18***	8820.86***
LR test of rho	408.81***	407.10***	407.13***	407.22***	310.04***	314.38***
Observations	108,441	108,441	108,275	108,275	96,128	96,107

Notes: Coefficients reported in Table 1 are marginal effects and associated standard errors from a random effects probit specification. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Controls are measured in period *t* and so represent the lagged value of characteristics. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively. Smaller sample sizes for specifications (3)–(6) reflect missing data about included housing-related variables.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

The estimates reported in Table 2 define mobility as a move across a defined spatial unit, either an SA2 (1), SA3 (2) or an interstate (3) move. The results from this analysis are similar to those reported in Table 1 and indicate that private renters are the most mobile among the tenure groups—though as expected, the propensity to move is somewhat lower than when ‘any move’ is considered. For example, private renters are approximately 10 (6) percentage points more likely to move across SA2 (SA3) boundaries than the omitted category of outright owners. There is some evidence that unemployed individuals are more likely to make longer distance moves, with the coefficient in column (2) being positive and significant; the magnitude is, however, relatively small. Interestingly, there is some evidence that individuals make more substantial moves across SA2 and SA3 boundaries when local area house prices are high. In columns (2) and (3), the coefficient on local area house prices measured at the SA3 level is positive and significant, suggesting that house prices act as a push factor for individuals in the context of mobility decisions.

Table 2: Inter-SA2, inter-SA3 and interstate mobility among individuals

	(1) Move across SA2	(2) Move across SA3	(3) Interstate move
LVR <0.5	-0.008* (0.004)	-0.006* (0.003)	0.0000 (0.001)
LVR >=0.5 & <0.8	-0.000 (0.004)	0.002 (0.004)	0.002* (0.001)
LVR >=0.8	-0.006 (0.005)	-0.003 (0.004)	0.000 (0.001)
Private renters	0.098*** (0.004)	0.061*** (0.003)	0.008*** (0.001)
Social renters	0.015* (0.006)	0.010 (0.005)	0.003* (0.001)
Rent-free	0.081*** (0.006)	0.054*** (0.005)	0.007*** (0.001)
Average area (SA3) house value/10,000	0.002*** (0.000)	0.002*** (0.000)	0.000 (0.000)
Area (SA3) unemployment rate	0.001 (0.001)	0.000 (0.000)	-0.000 (0.000)
Couldn't pay rent/mortgage	0.006 (0.003)	0.004 (0.003)	0.000 (0.001)
Monthly housing costs/100	-0.000** (0.000)	-0.000** (0.000)	-0.000 (0.000)
Years at address	-0.002*** (0.000)	-0.002*** (0.000)	-0.000*** (0.000)
Number of persons	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.000)
Employed part-time	-0.007* (0.003)	-0.004 (0.003)	0.000 (0.000)
Unemployed	0.010 (0.005)	0.011* (0.004)	0.002 (0.001)
NLF marginally attached	-0.001 (0.004)	0.002 (0.004)	0.002 (0.001)
NLF not marginally attached	-0.005 (0.003)	-0.001 (0.003)	0.001 (0.001)
Underemployed	-0.000 (0.004)	0.001 (0.003)	0.000 (0.001)
Wald Chi ²	6199.06***	4289.19***	914.15***
LR test of rho	310.34***	367.56***	255.10***
Observations	96,107	96,107	96,107

*Note: Coefficients reported in Table 2 are marginal effects and associated standard errors from a random effects probit specification. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Controls are measured in period t and so represent the lagged value of characteristics. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

2.3 Geographic mobility among the unemployed and underemployed

Of particular interest in the current research is the way in which housing is related to behaviours for those individuals who have suffered a labour market shock of some form. The statistical analyses reported in Tables 1 and 2 control for the individual's labour force status through a series of dummy variables. All other variables, such as the unemployment rate and housing tenure, have the same value for individuals across different labour market states. To provide a more general specification, and one that allows the relationship of key housing-related measures to differ across labour market states, in Table 3 we present the results from a series of specifications that examine the geographic mobility behaviour of unemployed and underemployed individuals separately. As noted in Chapter 1, the underemployed represent a relatively large share of the employed population, but one that has attracted little empirical attention. Underemployment is important because it reflects a less-than-optimal outcome in the labour market in a similar, though arguably not as acute, manner as unemployment.

In Table 3 we report the results from three specifications for those individuals who are identified as unemployed or underemployed in HILDA. In particular, we again use specification (6) from Table 1 and consider for these groups: any move, moves across SA3 boundaries, and interstate moves. In many cases, the estimated coefficients are insignificant. However, among the unemployed and the underemployed, it is private renters who show the greatest propensity to be mobile—though the likelihood of renters moving interstate is less pronounced. In general, other housing-related variables are unrelated to geographic mobility decisions; though for the underemployed, higher local area housing costs are associated with a greater propensity to report mobility across SA3 boundaries in a statistically significant manner.

The key message that comes out of Table 3 and the full set of regression results is that the underemployed appear to behave in a similar fashion to the unemployed, at least with respect to geographic mobility. While generally not garnering as much attention as the unemployed, it remains the case that the underemployed represent a significant share of the labour force, and the sub-optimal outcomes experienced by this group suggest that the labour market is not functioning as efficiently as it could.

Table 3: Geographic mobility among the unemployed and underemployed

	Unemployed			Underemployed		
	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Any move</i>	<i>Move across SA3</i>	<i>Interstate move</i>	<i>Any move</i>	<i>Move across SA3</i>	<i>Interstate move</i>
LVR <0.5	-0.054 (0.034)	-0.099** (0.031)	-0.007 (0.009)	-0.009 (0.018)	-0.015 (0.014)	0.005 (0.006)
LVR >=0.5 & <0.8	-0.065 (0.042)	-0.058 (0.033)	-0.006 (0.010)	0.013 (0.023)	-0.008 (0.018)	0.013 (0.008)
LVR >=0.8	-0.057 (0.053)	-0.021 (0.040)	0.001 (0.010)	0.007 (0.028)	-0.002 (0.022)	0.012 (0.008)
Private renters	0.158*** (0.028)	0.050* (0.022)	0.004 (0.007)	0.162*** (0.017)	0.063*** (0.013)	0.016* (0.008)
Social renters	0.007 (0.036)	-0.001 (0.028)	0.005 (0.008)	0.025 (0.026)	-0.023 (0.022)	0.006 (0.008)
Rent-free	0.093* (0.043)	0.070* (0.030)	0.006 (0.009)	0.141*** (0.027)	0.048* (0.020)	0.016 (0.090)
Average area (SA3) house value/10,000	-0.000 (0.004)	0.004 (0.003)	-0.000 (0.001)	0.004 (0.002)	0.004* (0.002)	0.000 (0.000)
Area (SA3) unemployment rate	-0.003 (0.005)	-0.006 (0.003)	-0.001 (0.001)	0.005 (0.003)	-0.000 (0.002)	-0.000 (0.001)
Couldn't pay rent/mortgage	0.001 (0.021)	0.003 (0.015)	0.006 (0.005)	0.0110 (0.013)	-0.006 (0.010)	-0.003 (0.003)
Monthly housing costs/100	0.000 (0.001)	-0.000 (0.001)	0.000 (0.000)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.000)
Wald Chi ²	231.07***	119.89***	33.12	567.18***	355.58***	57.96
LR test of rho	3.98*	0.19	3.50*	0.21	1.90	4.58*
Observations	2,562	2,562	2,448	5,789	5,790	5,326

*Note: Coefficients reported in Table 3 are marginal effects and associated standard errors. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Controls are measured in period t and so represent the lagged value of characteristics. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

2.4 Geographic mobility among couples

The final set of specifications dealing with geographic mobility in this chapter consider the moves by married couples. In many situations, decisions around mobility are likely to be made at the household level. Moreover, such decisions are likely to reflect the socio-economic characteristics and circumstances of members of the household. For the purpose of this analysis, married males from the individual sample were selected, as housing-related decisions around tenure are often linked to marital ties. The household characteristics of these males were included in the statistical analysis, along with their own personal characteristics. Moreover, the labour market status of each individual in the couple was included as control variables in the specification. It is likely, for example, that whether one partner is unemployed or underemployed is an important factor in determining whether the household exhibits geographic mobility.

Table 4: Geographic mobility among married couple households

	(1) Any move	(2) Move across SA2	(3) Move across SA3	(4) Interstate move
LVR <0.5	-0.010 (0.006)	-0.008 (0.005)	-0.004 (0.004)	0.001 (0.002)
LVR >=0.5 & <0.8	-0.004 (0.007)	0.002 (0.006)	0.004 (0.005)	0.005* (0.002)
LVR >=0.8	-0.006 (0.009)	-0.0004 (0.007)	0.001 (0.006)	0.001 (0.002)
Private renters	0.136*** (0.006)	0.086*** (0.005)	0.056*** (0.005)	0.011*** (0.002)
Social renters	0.065*** (0.013)	0.036** (0.011)	0.033*** (0.009)	0.009** (0.003)
Rent-free	0.101*** (0.010)	0.065*** (0.009)	0.042*** (0.007)	0.005 (0.003)
Number of years at address	-0.002*** (0.000)	-0.002*** (0.000)	-0.001*** (0.000)	-0.000*** (0.0001)
Female householder underemployed	0.024* (0.012)	0.008 (0.010)	0.004 (0.008)	-0.001 (0.003)
Female householder unemployed	-0.008 (0.012)	-0.003 (0.010)	-0.006 (0.008)	0.001 (0.003)
Male householder underemployed	-0.013 (0.010)	-0.002 (0.009)	-0.002 (0.007)	0.000 (0.002)
Male householder unemployed	-0.003 (0.012)	0.007 (0.010)	0.009 (0.008)	-0.003 (0.003)
One or more h/hold members NLF	0.002 (0.004)	0.000 (0.003)	0.003 (0.003)	0.001 (0.001)
Average area (SA3) house value/10,000	-0.001 (0.001)	0.001 (0.001)	0.002** (0.001)	0.000 (0.000)
Area (SA3) unemployment rate	-0.001 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.000 (0.000)
Couldn't pay rent/mortgage	-0.001 (0.007)	-0.004 (0.007)	-0.004 (0.005)	-0.002 (0.002)
Monthly housing costs/100	-0.0001 (0.000)	-0.0001 (0.000)	-0.00 (0.000)	-0.000 (0.000)
Wald Chi ²	2095.22***	1443.98***	1009.70***	280.86***
LR test of rho	29.30***	24.48***	41.72***	30.55***
Observations	26,521	26,521	26,521	26,521

*Note: Coefficients reported in Table 4 are marginal effects and associated standard errors. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Controls are measured in period t and so represent the lagged value of characteristics. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Four specifications are reported in Table 4. The first defines geographic mobility as consisting of any move across consecutive waves of HILDA. The remaining specifications define mobility by focusing on moves that entail a move across a SA2 boundary or SA3 boundary, or interstate. The results of the analysis are similar to those for individuals and highlight the significantly higher propensity of couples in private rental tenures to report geographic mobility. While social renters are more mobile than owners, they remain significantly less mobile than those in private rental accommodation. Interestingly, the measures of household unemployment and underemployment do not in general have significant impacts on geographic mobility. One exception to this is the results reported in column (1), where female underemployment is associated with a higher likelihood that the couple moves across waves of HILDA. One possible reason for the insignificance of unemployment/underemployment across the specifications reported in Table 4 is that the couple relationship provides a means by which the risk associated with economic shocks such as these can be shared across household members, possibly reducing the necessity of mobility. As with the results for individuals, in the specification that considers mobility across SA3 boundaries there is some evidence that higher housing costs in the local area are associated with a greater probability of mobility.

2.5 Policy development implications

The Oswald thesis posits that there is a direct link between levels of home ownership and unemployment rates. An important mechanism by which this relationship is propagated is through lower rates of geographic mobility among home owners, which are generally attributed to the higher costs of such moves compared to the costs for individuals in other tenures, especially private renters. The analysis in this chapter addresses that issue directly by considering the propensity of individuals and couples to report geographic mobility across successive waves of HILDA. Moreover, the analysis has been undertaken for specific sub-groups, and controls for an array of socio-economic measures which are generally considered to be relevant for the mobility decision.

From a neoclassical economic perspective, geographic mobility is a decision that can be characterised as being driven by a comparison of the costs and benefits of 'staying' rather than 'moving'. While some of those costs are idiosyncratic and household or person dependent, a variety of housing-related factors and policy settings can have a direct impact on the costs associated with geographic mobility, especially in regards to tax and transfer policies. These include policy settings that impact on individuals across tenures.

In the case of home owners, the impediments to geographic mobility are generally associated with the stamp duty and transaction costs that are coupled with transfers of ownership. It is generally acknowledged that such taxes reduce mobility relative to what they would be in an environment with a more neutral tax setting, such as a broad-based land tax (Davidoff and Leigh 2013; Henry, Harmer et al. 2009). More generally, it is acknowledged that the preferential treatment of owner-occupied housing in the Australian tax and transfer system provides a range of incentives for home ownership as a dominant form of tenure (Henry, Harmer et al. 2009). While such an outcome generates a range of positive outcomes, the impact on reduced rates of mobility should be noted.

Geographic mobility is generally assumed to be less costly for private renters. Moreover, the Australian system of transfers provides a well-targeted set of benefits, which in the case of housing assistance in the form of CRA, 'moves with the household'. This is seen as a key benefit of such an approach, though the potential inadequacy of CRA and variation in the relative value of CRA across markets is potentially one aspect of the program that could be revisited.

The evidence in this chapter suggests that individuals in social housing are substantially less mobile than those in private rental accommodation, and exhibit similar, though slightly higher, rates of geographic mobility to those in owner-occupation. Social housing provides specific challenges for a number of reasons. In general, social housing recipients exhibit relative high levels of need for support. Moreover, those in social housing are presented with the challenge that geographic mobility may mean the loss of this form of housing assistance. Mobility in this context may be very costly—an issue that can potentially be addressed through appropriate policy measures that reduce the risks of relocating and ensure continued security of tenure.

3 Housing tenure, attitudes to risk and geographic mobility

Geographic mobility decisions can impose potentially large costs and uncertainty on individuals and households. For risk-averse individuals, such costs might be a key factor in discouraging mobility. Moreover, such costs and associated risks potentially differ across tenure types. Home owners, for example, may face large capital losses in moving between housing markets. Econometric analysis has sought to identify how attitudes to risk impact on geographic mobility decisions and how this differs across tenure types.

The statistical analysis in this chapter uses a measure of an individual's willingness to accept financial risk to identify the relationship between geographic mobility and risk aversion across individuals in different tenures. The findings indicate that:

- There is some, albeit limited, evidence that risk-averse individuals are less likely to exhibit geographic mobility.
 - Risk-averse home owners with mid to high LVRs and private renters are less likely to report moving across waves of HILDA.
 - For the unemployed and the underemployed, there is no evidence that attitudes to risk are related to geographic mobility.
-

In this chapter we augment the analysis from Chapter 2 by considering one aspect of geographic mobility that has attracted relatively little attention, namely attitudes to risk. The Productivity Commission (2014b) notes that attitudes to risk are likely to be an important consideration in the context of mobility decisions (p. 44). Moving is inherently uncertain, with existing social networks likely to be lost, and risks associated with employment prospects and housing markets. While some individuals may see a change of location as part of an 'adventure', among risk-averse individuals the uncertainties associated with a potential move may represent an additional psychological cost. Moreover, for home owners, the potential impacts on housing wealth may discourage geographic mobility.

In Section 3.1 we consider existing research on the way attitudes to risk impact on geographic mobility decisions. In Section 3.2, we present results from our analysis, building on the analysis presented in Chapter 2 by augmenting the specifications in that chapter with measures that capture the individual's attitude to risk.

3.1 Empirical research on attitudes to risk, housing tenure and geographic mobility

Decisions around geographic mobility are likely to reflect *expectations* about the costs and benefits that will accrue over time. Such costs and benefits are, by their very nature, uncertain (Chung and Haurin 2002). Kan (2003) explores the role of attitudes to risk in influencing geographic and job changes using the PSID. The analysis in that paper utilises a multinomial random effects probit model and identifies that individuals who are risk-averse are less likely to make changes in either residential location or job—with the impact of risk aversion largest for

moves that entail residential and job mobility. Nonetheless, Kan argues that risk aversion would seem to play a relatively small part in the overall mobility decision.

For existing home owners, potential capital losses on housing pose one source of risk when the mobility decision is being considered. Such concerns may be particularly important in contexts where housing prices have demonstrated sustained declines over time. Nonetheless, analysis based on declines in US house prices during the 1990s suggests that the geographic mobility of home owners was not constrained by falling house prices. In particular, Engelhardt (2003) examines the behaviour of owner-occupiers in the US who had high LVRs at the time the home was purchased. While the analysis identifies that household mobility is significantly influenced by nominal loss aversion, there is limited evidence that low equity associated with falling house prices constrains mobility. Chan (2001) also finds evidence that loss aversion on the part of owner-occupiers limits residential mobility. However, the analysis in that paper indicates that home owners in the US who experienced lower house prices, exhibited substantially lower rates of geographic mobility than would have occurred in the absence of house price declines.

The Productivity Commission, in its 2015 report on geographic mobility, noted that the risks faced by the unemployed may be particularly acute. For very low-skilled individuals, geographic mobility can be associated with a higher risk of entering poverty and homelessness. Moreover, frequent moves can undermine social networks and educational outcomes for individuals and their children. There is also some evidence that individuals who might be termed 'more adventurous' are more likely to be open to moving, especially to moving significant distances (p. 176). Finally, it may be the case that the legal and administrative costs associated with moving provide an additional barrier in the event that the individual is particularly risk-averse.

3.2 Analysis of attitudes to risk, housing tenure and geographic mobility

A key benefit of the HILDA dataset is the extensive set of control variables that are available for analysis. In a number of waves of the data, individuals are asked about their willingness to take on financial risk.¹⁴ Individuals who indicate that they would 'not be willing to take any financial risk' are identified as being risk-averse for the purpose of the analysis presented below. Though not a direct measure of the level of risk aversion for the individual, the constructed measure provides a proxy for willingness to take on a risky outcome across a number of waves of the HILDA dataset.

The analysis proceeds by augmenting the specifications reported in Chapter 2. In particular, four empirical specifications are reported in Table 5. In all specifications the dependent variable is whether the individual reports moving across waves of HILDA. In specification (1), a simple measure of risk aversion is added, while in specification (4) the measure of risk aversion is interacted with the various tenure categories. In columns (2) and (3), the specification used in column (1) is repeated using the sample of unemployed and underemployed individuals respectively. Note that sample sizes are substantially smaller than those used in Chapter 1 because of the more limited availability of the information about financial risk in the HILDA data.

¹⁴ Specifically, individuals with sufficient funds are asked about their willingness to take on risk in exchange for additional returns in all waves except wave 5, 7 and 9. In addition, for those who do not have cash funds, they are asked about their willingness to take on financial risk assuming they did have cash in waves 6, 8 and 10 to 14. The sample used in the analysis for this chapter uses waves 10 through to 14 of the HILDA data. Due to the categorical coding of the variable, it is not possible to include a cardinal measure of risk aversion in the empirical models.

Table 5: Geographic mobility decisions and attitudes to financial risk

	(1) All	(2) Unemployed	(3) Underemployed	(4) Interactions
LVR <0.5	-0.023** (0.007)	-0.134 (0.069)	-0.023 (0.034)	-0.017 (0.009)
LVR >=0.5 & <0.8	-0.003 (0.008)	-0.045 (0.067)	0.041 (0.042)	0.011 (0.010)
LVR >= 0.8	-0.0278** (0.010)	0.009 (0.083)	-0.002 (0.051)	-0.012 (0.012)
Private renter	0.135*** (0.007)	0.110* (0.044)	0.178*** (0.033)	0.147*** (0.009)
Public housing	0.030* (0.012)	-0.0032 (0.062)	-0.017 (0.054)	0.056** (0.021)
Rent-free	0.111*** (0.011)	0.105 (0.062)	0.167*** (0.042)	0.117*** (0.014)
Risk-averse	-0.010** (0.004)	0.039 (0.028)	-0.000 (0.016)	0.011 (0.009)
Local housing costs	0.002** (0.001)	-0.001 (0.007)	0.005 (0.004)	0.002** (0.001)
Unemployment rate	0.000 (0.001)	-0.003 (0.008)	0.005 (0.005)	-0.000 (0.001)
Couldn't pay rent/mortgage	0.014* (0.007)	0.028 (0.036)	-0.015 (0.024)	0.014* (0.007)
Actual housing costs	-0.000 (0.000)	0.001 (0.001)	0.000 (0.001)	-0.000 (0.0004)
[LVR <0.5]xRisk-averse	-	-	-	-0.014 (0.013)
[LVR >=0.5 & LVR >0.8]xRisk-averse	-	-	-	-0.031* (0.013)
[LVR >=0.8]xRisk-averse	-	-	-	-0.037* (0.016)
[Private renter]xRisk-averse	-	-	-	-0.025* (0.011)
[Public housing]xRisk-averse	-	-	-	-0.044 (0.024)
[Rent-free]xRisk-averse	-	-	-	-0.015 (0.020)
Wald Chi ²	2929.36***	70.89*	265.24***	2938.85***
LR test of rho	40.84***	0.97	5.30	40.03***
Observations	31,554	855	1,912	31,554

Note: Coefficients reported in Table 5 are marginal effects and associated standard errors. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Controls are measured in period *t* and so represent the lagged value of characteristics. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 10 to 14 of HILDA.

The empirical results show some, albeit limited, association between risk aversion and geographic mobility. The variable 'risk-averse' is statistically significant when entered individually into the specifications for all individuals (column (1)) and is associated with a small reduction in the likelihood that the individual reports geographic mobility across waves of HILDA (in the order of 1%). Using a similar specification for the unemployed (column (2)) and underemployed (column (3)), the coefficient on the measure of risk aversion is statistically insignificant. When interacted with tenure, the results indicate that risk aversion is associated with a lower propensity to exhibit geographic mobility among some groups. In particular, risk-averse individuals in owner-occupied dwellings with LVRs greater than 0.5 and those in private rental accommodation exhibit lower rates of geographic mobility.

3.3 Implications for policy development options

The statistical analysis reported in Table 5 does not suggest that attitude to risk is strongly associated with geographic mobility decisions. It is important to stress, however, that the analysis is limited by a number of considerations. First, it should be emphasised that the measure of risk aversion used is not ideal, but rather reflects the information which is available in the HILDA dataset. Moreover, for those who do not have spare cash available for investment purposes, the question about the type of financial risk they would be prepared to take is posed in a hypothetical sense, and may be a poor measure of actual attitudes to risk. Finally, the sample sizes used in the analysis are substantially smaller than those used in the analysis reported in Chapter 2 and thus the results should be treated cautiously.

Nonetheless, the analysis does serve to highlight the potential importance of the risks associated with geographic mobility. As the Productivity Commission (2014b) notes, there are various sources of risk associated with mobility. Given that individuals who are risk averse are less likely to exhibit geographic mobility, to the extent that these can be minimised at relatively low cost, they are likely to enhance rather than hinder geographic mobility and labour market adjustment more generally.

4 Housing tenure and job search intensity

Job search models posit that unemployed individuals undertake search until they find a suitable match with a prospective employer. Importantly, job search models provide sound theoretical underpinnings for the Oswald thesis and the SMH.

There are a number of alternative dimensions, along with behavioural adjustments, that may occur in job search models. The intensity of job search activities is a potentially important means by which the unemployed can alter the likelihood that they receive an offer of employment.

The statistical analysis in this chapter compares the job search intensity of unemployed individuals across different tenures. Information on the level of unemployment in the individual's local labour market is included, along with a range of housing-related measures. The findings indicate that:

- Owner-occupiers with low LVRs tend to search less intensively than other groups of unemployed individuals, possibly reflecting the use of accumulated equity to fund a longer period of job search.
 - Financial stress related to housing is associated with significantly higher rates of job search activity.
-

In this chapter and the next, specific aspects of the behaviour of unemployed individuals is examined, namely job search intensity and the level of the reservation wage. Job search models provide an underlying conceptual framework that motivates this analysis. Search theory has a long tradition in economics and the framework captures the idea that economic agents make rational utility-maximising decisions over time that require accumulation of information (Mortensen 1986). Search theory has been fruitfully applied to labour markets, where the actions of unemployed individuals are analogous to that of a 'shopper' who is trying to identify the best transaction to engage in. For a shopper who is attempting to purchase a good, this will usually mean the lowest possible price. In the case of an unemployed jobseeker, the best outcome is a job that offers the highest possible wage.

At a very rudimentary level, job search theory posits that unemployed individuals who are searching for jobs periodically receive offers of employment.¹⁵ Those offers of employment are generally characterised as a wage which may or may not be acceptable to the individual.¹⁶ If the offer is acceptable, then a successful match between the unemployed jobseeker and the employer ensues, the job search ends and an exit from unemployment occurs. If no offer is received, or the offer is unacceptable, the search continues.

A key aspect of job search models, described above, is that they focus on the costs and benefits of accepting an offer that is made versus continued search. Much of the empirical

¹⁵ The discussion in this chapter will focus on unemployed individuals. Job search models can be generalised to include 'on-the-job' search by employed individuals.

¹⁶ More realistically, jobs generally encompass a variety of dimensions including the number of hours required and location of the job. Search models generally extrapolate from such complexities and focus on the offered wage. While doing so results in some loss of generality of the model, the fundamental results posited by job search models remain.

analysis that has adopted the job search framework has, for example, considered how income support measures available to unemployed individuals impact on exits from unemployment. Intuitively, an increase in the benefits available while unemployed reduces the cost of being unemployed and, a priori, would be expected to increase the time until an exit from unemployment occurs. Similarly, when examining the potential costs and benefits of the offer that is made, links between housing tenure and labour markets become apparent. Indeed, the discussion of the Oswald thesis in Chapter 2 makes clear that at a micro-economic level, the potential relationship between housing tenure and outcomes in the labour market are couched in terms of search models. Similarly, Coulson, Laing and Wang (2001) present a theoretical model of the SMH that relies on a job search model in which costly matching between employees and employers leads to predictions consistent with the empirical regularities associated with the SMH.

In the empirical analysis for this report, three aspects of the job search approach are of particular relevance. The first is the intensity of job search activity that is undertaken. In simple job search models it is assumed that the offers arrive periodically through some random process. In essence, job search is exogenous or given and is not a choice open to the individual. More realistically, unemployed individuals choose the level of search that is undertaken and in doing so influence the rate at which offers of employment are received. To return to the example of unemployment benefits, in many countries it is the case that payments to the unemployed last only for a finite period. As the time before benefits expire approaches, it is generally hypothesised that unemployed individuals will search more intensively and thereby increase the number of offers that 'arrive'. This behaviour, namely search intensity, forms the focus of the analysis in this chapter.

The second aspect of interest relates to what constitutes an acceptable offer for an unemployed jobseeker. In job search models, offers of employment are generally considered to be acceptable if they exceed what is referred to as the individual's reservation wage. In a stationary model of job search, in which the environment and the individual's situation does not change over time, the reservation wage will generally be constant over the period of job search. In effect, the individual simply waits for an offer of employment at a wage that exceeds the fixed reservation wage. In richer models of job search, the reservation wage is time dependent and reflects the costs and benefits associated with continued job search. To return again to a situation of finite unemployment benefits, search models generally hypothesise that as the point when those benefits exhaust approaches, jobseekers will tend to reduce their reservation wage. Put another way, the cost associated with continued search without the financial support provided by unemployment benefits exceeds the potential benefits associated with getting a higher wage offer in future periods. This aspect of the search process, namely the level of the reservation wage, forms the focus of the analysis in Chapter 5.

So what might be the implications of housing tenure for decisions concerning reservation wages and job search intensity? Housing-related considerations are likely to be important for both job search intensity and reservation wage setting. Across tenure types, individuals face different constraints with respect to the ability to undertake job search over a prolonged period. For renters and those with mortgage commitments, the ability to undertake protracted job search may be severely constrained. Conversely, individuals in social housing or outright owners may have a greater capacity to undertake search for an extended period of time. In the case of outright owners, mortgage commitments do not represent a pressing constraint and the availability of home equity potentially provides an opportunity via which search activities can be funded over time. For those in public or social housing, income-dependent rents mean that periods of low income are potentially less constraining, at least in terms of housing circumstances, than other tenures such as private rental accommodation. On the other hand, for those with mortgage commitments or who are renting privately, housing costs may constrain the set of acceptable offers. In short, housing tenure will affect the benefits and costs

associated with accepting an offer of employment. In turn, housing tenure may impact on the individual's search intensity and their reservation wage.

The final issue of interest stemming from job search models relates to the relationship between job search and the location of any offer that is available. In general, job search models do not distinguish between offers of employment that are 'local' and those that are 'non-local'. From a housing perspective, such a distinction is likely to be important. The local labour market potentially offers a number of advantages—for example, travel or commuting costs are likely to be lower—and thus the impetus to move is substantially lower. To the extent that geographic mobility costs vary across tenure types, the difference in costs (and therefore the net benefits) of offers of employment across local and non-local employment markets is likely to be significant. As discussed previously, it is generally assumed that home owners experience significantly higher geographic mobility costs than those in private rental accommodation. Moreover, for those in social housing the costs of geographic mobility can be very high given the non-fungibility of this form of assistance and the long wait lists associated with social housing.

The importance of the distinction between local and non-local markets is highlighted by Morescalchi (2016), who describes a model in which the unemployed can search in both local and non-local markets. In this model, the higher costs of geographic mobility for home owners mean that job search intensity is higher and reservation wages are lower in local markets compared to non-local markets. In Chapter 6, we begin to explore this issue by considering patterns of geographic mobility and job mobility over time among individuals who are *employed*. In particular, we consider models in which geographic mobility and job mobility examined, with separate models for local and non-local mobility.

4.1 Empirical research on job search intensity

The existing literature on the intensity of job search is relatively limited, in part because of data constraints around the type and amount of job search that is undertaken by unemployed individuals. In a recent study, Morescalchi (2016) investigated the behaviour of unemployed jobseekers in the UK during the period 1999–2009. In that analysis, alternative types of search activities are examined, including: the use of job centres or careers offices; newspaper advertisements; direct applications to employers; and the use of personal networks such as friends and relatives. The analysis examined the behaviour of individuals in four housing tenures: outright owners, owners with a mortgage, social renters and those renting private accommodation. The analysis in that paper identifies that outright owners search less intensively than private renters, by approximately 11 per cent. Mortgagors have the highest level of search intensity, while unemployed jobseekers residing in social housing search significantly less intensively than private renters. Interestingly, although outright owners search less intensively than private renters, they tend to exhibit shorter spells of unemployment. Evidence in the paper suggests that this is due, in part at least, to the use of more efficient or effective search methods.

Böheim and Taylor (2001) also note that different job search techniques show varying degrees of effectiveness. While they argue that housing tenure is unlikely to directly impact on the search strategies adopted, they highlight that finding a job may be linked to 'social cohesion', with many jobs found through informal networks and personal contacts. To the extent that some tenure types, such as home-owning, offer more stable or wider social networks, this too may affect the types and outcomes of job search activities. Böheim and Taylor do not, however, include tenure status in their analysis of search intensity.

4.2 Analysis of job search intensity

The analysis reported in this section uses waves 1 to 14 of the HILDA data to examine the job search behaviour of *unemployed* individuals. In each wave of the HILDA dataset, unemployed individuals who report looking for work are asked whether they have engaged in various job search activities over the previous four weeks. Respondents can nominate a range of activities, including: answering advertisements for jobs; checking with registered employment agencies; and contacting friends or relatives. Following Morescalchi (2016) and Boehm and Taylor (2001), the measure of job search intensity used in the analysis in this chapter is the total number of different types of activities that are used over the preceding four week period. While such a measure does not capture the number of times each activity has been undertaken, nor the time spent in different types of search activities, Morescalchi argues that this nonetheless captures the amount of search undertaken by unemployed individuals in a reasonably robust manner (2016: 295).¹⁷

The nature of the measure used in this analysis relies on a somewhat different econometric approach to that used in Chapters 2 and 3. The dependent variable in this case is a number between zero and eight, reflecting the number of types of job search activities that the unemployed individual can report undertaking in the preceding four weeks. Because of the discreteness of the dependent variable and the limited number of values it can take, a count data approach is used in the empirical specifications. In particular, a series of Poisson regression models are estimated, where the regression fits models of the number of occurrences or 'counts' of job search activities over the four week period the respondent is asked about. Summary statistics of the sample used and a description of the estimation model are presented in Appendices 1 and 2 of this report, respectively.

Table 6 shows results from a series of specifications that are analogous to those reported in Table 1. Housing tenure and housing-related variables are included in the specifications, with successively more detailed information included in subsequent specifications. Again, the omitted tenure category is outright owners. Only a selected set of results are reported in Table 6, though full results are presented in Appendix 2.¹⁸ In the full set of results, many of the relationships are consistent with a priori expectations. For example, job search intensity increases with unemployment duration, and also increases with education level. It is notable that the local unemployment rate is not related to the level of job search intensity.

The results in column (1) of Table 5 suggest that unemployed individuals with a mortgage use fewer search activities (i.e. they search less intensively) relative to outright owners—using about 0.2 fewer activities. Individuals in public housing use 21 per cent fewer search methods than outright owners, while private renters use approximately 0.14 more search methods than outright owners—in both cases, however, the effects are not significant at standard levels of significance.

¹⁷ The models reported in Table 6 uses as the dependent variable the total number of search types reported by the respondent over a the four week period. An alternative specification was also estimated, in which the number of 'active job search activities' was used as the dependent variable. Active job search activities included looking in print media or online, but not actually answering an advertisement. The results of this analysis, which are available on request, are similar to those reported in Table 6.

¹⁸ Note that the full specifications reported in Appendix 2 control for age, education and family status. The results relating to the effect of tenure discussed in the text should be interpreted as *ceteris paribus*.

Table 6: Job search intensity

	(1)	(2)	(3)	(4)	(5)
Mortgagor	-0.194** (0.092)	-	-	-	-
LVR <0.5	-	-0.221** (0.104)	-0.221** (0.104)	-0.259** (0.111)	-0.145 (0.126)
LVR >=0.5 & <0.8	-	-0.146 (0.129)	-0.150 (0.130)	-0.267 (0.138)	-0.096 (0.165)
LVR >=0.8	-	-0.187 (0.154)	-0.190 (0.155)	-0.323 (0.167)	-0.091 (0.201)
Private renter	0.141 (0.096)	0.145 (0.096)	0.145 (0.097)	0.048 (0.104)	0.161 (0.120)
Public housing	-0.211 (0.128)	-0.208 (0.128)	-0.210 (0.128)	-0.201 (0.145)	-0.128 (0.150)
Rent-free	-0.201 (0.185)	-0.198 (0.185)	-0.199 (0.185)	-0.229 (0.201)	-0.220 (0.200)
Unemployment rate	-0.004 (0.017)	-0.005 (0.017)	-0.006 (0.017)	-0.004 (0.018)	-0.004 (0.018)
Unemployment duration	0.002*** (0.001)	0.002** (0.001)	0.002*** (0.001)	0.003*** (0.001)	0.002*** (0.001)
(Unemployment duration) ²	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)	0.000** (0.000)	0.000** (0.000)
Local housing costs	-	-	-0.004 (0.017)	-0.008 (0.018)	-0.004 (0.018)
Couldn't pay rent/mortgage	-	-	-	0.412*** (0.080)	0.413*** (0.080)
Actual housing costs	-	-	-	-	-0.011** (0.005)
Observations	3,459	3,459	3,451	2,916	2,916
Pseudo R ²	0.022	0.022	0.022	0.027	0.027

*Note: Coefficients reported in Table 6 are marginal effects and associated standard errors from a count data model. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, major statistical region and time dummy variables. Full results are presented in Appendix 2. A random effects model was also estimated and the results from that analysis are similar to those reported in Table 6. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 10 to 14 of HILDA.

In specifications (2) through (5) in Table 6, owners with a mortgage are disaggregated according to their level of indebtedness, as measured by their LVR. In specification (2), the analysis indicates that owner-occupiers with low LVRs report lower rates of job search intensity, while those with higher LVRs search in a similar manner to outright owners. This pattern may be consistent with those owners being able to draw on the accumulated equity they have available in order to prolong search activities. Among individuals in other tenures, the analysis suggests that job search intensity is comparable with that of outright owners, though private renters on

average use more search methods than outright owners—in general, however, the coefficients on those tenures are not statistically significant.

Specification (3) includes a measure of local area housing costs, while specification (4) incorporates a measure indicating that the individual reports being in housing arrears. The individual's own housing costs are included in specification (5). Local area housing costs do not appear to be important for the intensity of job search, though the results in column (4) indicate that individuals who report not being able to cover rent or mortgage payments over the previous 12 months search much more intensively (*ceteris paribus*), using 0.4 more search methods.

When the actual housing costs of the individual are included in the specification, the coefficients on the tenure categories are insignificant. However, the coefficient on the housing cost measure is negative and statistically significant. This suggests that those individuals with high costs of housing search less intensively. Such a result is perhaps counterintuitive, though it should be noted that the specifications in columns (1) through (4) indicate that owner-occupiers with a mortgage generally search less intensively than outright owners. The negative coefficient on direct housing costs in column (5) is consistent with this pattern, in that owner-occupiers with higher mortgage commitments, and hence higher housing costs, search less intensively. Nonetheless, the underlying pattern is one that warrants additional inquiry.

4.3 Policy implications

Discussion of the implications of the results presented in this chapter for policy development is set out in Chapter 5 after a second component of job search models, namely the reservation wage, is considered.

5 Housing tenure and reservation wages

Job search models posit that unemployed individuals undertake search until they find a suitable match with a prospective employer. Individuals will accept an offer of employment if the offered wage exceeds their minimum acceptable wage or the reservation wage.

The statistical analysis in this chapter compares the reported reservation wages of unemployed individuals across different tenures. Housing tenure and housing costs are likely to impact on an individual's reservation wage and the likelihood they exit unemployment. The empirical specifications include information on the level of unemployment in the individual's local labour market, the length of the unemployment spell, along with a range of housing-related measures. The findings indicate that:

- Owner-occupiers with a mortgage generally report higher reservation wages than individuals in other tenures.
 - Owner-occupiers with low LVRs tend to report higher reservation wages.
 - Reservation wages of those in rental accommodation and social housing are lower than those for owner-occupiers (*ceteris paribus*).
-

Following the discussion in Chapter 4, in this chapter we turn to a second aspect of the job search models, namely the level of the reservation wage. Recall that in some job search models, the individual's reservation wage (lowest acceptable wage to take an offer of employment) is constant. This is unlikely to be the case in a dynamic setting. In settings where benefits for an unemployed jobseeker are finite, a decreasing reservation wage reflects the fact that as the date of benefit expiration approaches, the likelihood of finding a high wage offer gets lower and the willingness to accept a lower offer of employment increases. Hence, the reservation wage decreases.

More generally, Mortensen (1986) notes that the reservation wage and financial wealth are likely to be positively related (p. 861), so that even in a setting like Australia, where unemployment benefits are not time limited, reservation wages are likely to decrease over time. Moreover, for similar reasons to those discussed for the intensity of search activity, it is likely that reservation wages are likely to differ according to tenure.

5.1 Empirical research on reservation wages

Economic research has traditionally tended to focus on how the level of reservation wages varies according to the level of unemployment in the local area. This focus has reflected the traditional interest in the 'wage curve', that is, the relationship between the level of unemployment and the level of wages in a given spatial context. With the development of theoretical job search models and data sources that provide information on the reservation wages of the unemployed, increasing attention has been directed at the estimation of the determinants of the reservation wage for individuals (Jones 1989).

For Australia, an early analysis of reservation wages was conducted by Hui (1991). The analysis in that paper did not explicitly include a variable capturing housing tenure, though it did

control for geographical location and the willingness of individuals to move for the purpose of gaining employment. The analysis in that paper indicates that while there was some evidence that individuals in more remote areas set lower reservation wages, an individual's willingness to move for the purpose of securing employment was unrelated to their reservation wage. More recent analysis by Brown and Taylor (2015) examined the determinants of reservation wages for the unemployed in the UK. Again, housing tenure is not included in the specification and the results suggest that an increase in the local unemployment rate is associated with lower reservation wages (*ceteris paribus*).

One study that does include housing-related measures is Addison, Centeno and Portugal (2004). The analysis in that paper considers the reservation wages of unemployed individuals across a series of European countries. Home ownership does appear to be associated with a higher reservation wage for the unemployed, though the analysis does not make clear whether this refers to outright owners only or includes those who have a mortgage.

5.2 Analysis of reservation wages

The analysis reported in this section uses waves 1 to 14 of the HILDA data to examine the reservation wages of unemployed individuals. In each wave of the HILDA dataset, individuals who report not working but who wish to work are asked their lowest acceptable wage per hour. Following Brown and Taylor (2015) and Addison, Centeno and Portugal (2004), a 'log reservation wage' equation is specified. The model is estimated as a standard Ordinary Least Squares (OLS) specification and includes a series of housing-related variables.¹⁹

As in Chapter 4, Table 7 shows results from a series of specifications that are analogous to those reported in Table 1. Housing tenure and housing-related variables are included in the specifications, with successively more detailed information included in subsequent specifications. Again, the omitted category is outright owners. Only a selected set of results are reported in Table 7, though full results are presented in Appendix 2. In the full results, many of the relationships are consistent with a priori expectations. For example, reservation wages decrease as unemployment duration increases, and increase with education level. Again, it is notable that the reservation wage is not related to the local unemployment rate.

The results in column (1) of Table 7 indicate that unemployed individuals with a mortgage report higher reservation wages (4.4% higher) relative to outright owners. Individuals in private rental and public housing set reservation wages significantly lower (3 and 6% lower respectively) than outright owners, though these results are not significant for the private renters. In specifications (2) through (5), owners with a mortgage are disaggregated according to their level of indebtedness as measured by their LVR. In specification (2), the results indicate that owner-occupiers with low LVRs report higher reservation wages—recall that these individuals also reported lower rates of job search intensity. Among individuals in other tenures, the analysis suggests that reservation wages are also lower than those reported by owner-occupiers. Unemployed individuals in private rental accommodation have lower reservation wages compared to owner-occupiers with low LVRs, while reservation wages are lower again for individuals in social housing.

Specification (3) includes a measure of local area housing costs, while specification (4) incorporates a dummy variable indicating if the individual reported difficulties in paying housing costs in the past year. The individual's own housing costs are included in specification (5). The regression results suggest that local area housing costs are strongly and positively correlated

¹⁹ An additional specification controlling for unobserved heterogeneity using a random effects specification was also estimated. The results from that analysis are similar to those reported in Table 7.

with reported reservation wages, though care needs to be taken before attributing a causal effect to this correlation. It is possible, for example, that high reservation wages and in turn higher wages may have a direct causal impact on housing costs. Further, it is possible that other unobserved characteristics associated with particular regions are associated with both high housing costs and high wages.

Table 7: Reservation wage estimates

	(1)	(2)	(3)	(4)	(5)
Mortgagor	0.044*** (0.016)	-	-	-	-
LVR <0.5	-	0.063*** (0.018)	0.062*** (0.018)	0.064*** (0.020)	0.005 (0.022)
LVR >= 0.5 & <0.8	-	0.021 (0.022)	0.036 (0.022)	0.024 (0.024)	-0.063* (0.028)
LVR >=0.8	-	0.018 (0.027)	0.029 (0.027)	0.043 (0.029)	-0.076** (0.036)
Private renter	-0.019 (0.018)	-0.022 (0.018)	-0.020 (0.017)	-0.023 (0.019)	-0.081*** (0.022)
Public housing	-0.057** (0.023)	-0.060*** (0.023)	-0.059*** (0.022)	-0.044 (0.025)	-0.081*** (0.026)
Rent-free	-0.004 (0.031)	-0.006 (0.031)	-0.007 (0.031)	-0.002 (0.034)	-0.006 (0.034)
Unemployment rate	-0.002 (0.003)	-0.002 (0.003)	0.000 (0.003)	-0.003 (0.003)	-0.003 (0.003)
Unemployment duration	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000** (0.000)
(Unemployment duration) ²	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)
Local housing costs	-	-	0.018*** (0.003)	0.014*** (0.003)	0.012*** (0.003)
Couldn't pay rent/mortgage	-	-	-	-0.028 (0.015)	-0.028 (0.015)
Actual housing costs	-	-	-	-	0.006*** (0.001)
Observations	3,459	3,459	3,451	2,916	2,916
R ²	0.446	0.447	0.454	0.467	0.476

Note: Coefficients reported in Table 7 are marginal effects and associated standard errors from an OLS specification. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, major statistical region and time dummy variables. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

The final set of results reported in Table 7 include measures of tenure and direct housing costs. The results change somewhat moving from specification (4) to (5). For specification (5) it is no

longer true that owners with low LVRs report higher reservation wages than outright owners, though higher direct housing costs are positively correlated with reservation wages. The inclusion of direct housing costs effectively captures much of the information contained in the tenure category variables. Hence, for a given level of housing cost, individuals in private and social rental tenures report reservation wages around 8 per cent lower than those for outright owners (*ceteris paribus*). Moreover, mortgagors with higher LVRs, private renters and social renters report, on average, successively lower reservation wages—though in general, reservation wages increase with housing costs.

5.3 Implications for policy development options

The results reported in this chapter and Chapter 4 are of interest in part because to this point there has been little consideration of how job search behaviours vary across tenure types. While job search models posit that the unemployed compare the costs and benefits associated with continued job search, the focus of analysis has not been on the relationship between housing tenure and behaviours. The statistical modelling in Chapter 4 shows patterns in the data consistent with lower rates of job search intensity among owner-occupiers with mortgage commitments.²⁰ That is, job search intensity was negatively correlated with housing costs for this group. In comparison, the analysis in this chapter indicates that reservation wages are higher for those with mortgage commitments and that they increase with the level of housing costs more generally. Nonetheless, for a given level of housing cost, private renters and social housing tenants reported lower reservation wages.

Job search models have been used to focus on how policy settings such as changes in income support impact on the transition into employment. From a policy perspective, the impact of housing assistance measures on the behaviour of unemployed individuals is of particular interest. Consider, for example, CRA, which is available to private renters who are in receipt of another form of social security, including unemployment-related benefits. It is possible that the receipt of CRA has the potential to reduce the incentive for recipients to search intensively for employment, or to maintain their reservation wage at a higher level than it would be in the absence of CRA. Significantly, the analysis does not suggest that the unemployed in private rental accommodation search less intensively than owner-occupiers. Moreover, private renters' reported reservation wages tend to be lower than those of individuals in other tenures. Similar patterns are exhibited by those in social housing.

The analysis in this chapter and Chapter 4 does not allow one to infer if job search intensity is 'too low' or reservation wages 'too high' among particular groups. Indeed, the job search framework highlights the benefit associated with a longer search—that is, the possibility of finding a better match. For the unemployed, especially those in housing stress, such an outcome is desirable.

More broadly, the analysis in this chapter and the preceding chapter has policy implications around government transfer programs that provide support for unemployed individuals, and housing assistance schemes. Arguably, the experience with active labour market policies (ALMP) indicates that policy can help ensure that job search activities are used effectively and efficiently (Martin 2015). Notably, however, previous research has suggested that individuals in receipt of housing assistance such as CRA or in public housing that requires them to undertake mutual obligation activities, do not experience better outcomes relative to other participants in ALMPs (Feeny, Ong et al. 2008). The Productivity Commission, in its 2015 analysis of housing

²⁰ Note that the results are no longer significant when controls for housing costs are included in the empirical specification.

assistance, argued that the receipt of housing assistance does not appear to play a large role in the relatively low rates of employment among this group. Indeed, the analysis in this chapter and the preceding chapter indicate that the unemployed in private rental accommodation and those in social housing do not search less intensively or set higher reservation wages than those in other tenures. For policy changes to be effective, it is likely that they would need to be well designed, well targeted and coordinated across the range of services that unemployed individuals, especially those receiving housing assistance, require.

6 Residential mobility and job mobility

Residential mobility and job mobility decisions are closely related. One way that individuals and households can adjust behaviour and outcomes is through commuting time. Commuting time will often change if a job shift occurs but geographic (residential) mobility does not occur. Recent analyses have sought to consider how housing and job mobility decisions are related among employed individuals and the differences in behaviours across tenure types.

The statistical analysis in this chapter examines housing and labour market transitions using a multinomial approach. We explore differences in residential mobility decisions around local and non-local moves, along with the impact of commuting times on observed behaviours. For the unemployed and underemployed, transitions across labour market states are considered. The findings indicate that:

- Longer commuting times are associated with job-to-job transitions that do not involve geographic mobility.
 - Individuals in rental tenures have significantly higher rates of geographic mobility than owner-occupiers.
 - For the underemployed, geographic mobility does not appear to be associated with greater engagement in the labour market.
-

In this chapter, we consider two additional aspects of the relationship between housing and labour markets. In the first instance, we focus on individuals who are employed across consecutive waves of HILDA, examining patterns of job-to-job mobility and residential mobility. Second, we focus on the set of individuals who experience sub-optimal labour market outcomes in the form of unemployment or under-employment. For these individuals, we examine the labour market transitions they experience and how those transitions are associated with housing tenure and geographic mobility.

Consider first those individuals who are employed across consecutive waves of HILDA. In assessing the implications of the Oswald thesis, the models set out in Coulson and Fisher (2009) focus on the job search activities of workers who live in an economy consisting of two or more regions. More generally, Van Ommeren, Rietveld and Nijkamp (2000) argue that job mobility, residential mobility and commuting distance are mutually dependent. For those who are employed, a job-to-job transition may occur if a better employment opportunity arises in the region where they currently reside or another region. Commuting time likely represents an important consideration that influences whether and where an individual searches for a new job opportunity. In effect, if a new employment opportunity arises in the current region of residence, it might offer a reduced commuting time and therefore we might observe that a job change occurs without a corresponding change in residential or geographic location. In other instances, job changes will accompany geographic mobility across regions. This process is considered in this chapter through the use of a multinomial transition model.

Significantly, the analysis explores the distinction between local and non-local moves in conjunction with a job change. The aim of the approach is to identify patterns in joint geographic (residential) *and* job mobility decisions across different tenures. Doing so provides insight into

how geographic mobility differs across tenure types, and provides additional evidence around the role of tenure in facilitating labour market outcomes through mobility. Moving to a new job is one way that a currently employed individual may achieve a 'better match' in the labour market.

The approach is similar to that described in Morescalchi (2016). Specifically, we extend the mobility model from Chapter 2 to consider geographic mobility in a more general manner by focusing on the behaviour of *employed* individuals. We consider four possible transitions across waves of HILDA, as follows:

- no change in residential location (i.e. no geographic mobility) and no job change (i.e. no job mobility)
- geographic (residential) mobility but no job change
- a job change but no geographic mobility
- a job change *and* geographic mobility.

Of particular interest is the way in which such changes are related to housing tenure and other housing-related variables.

The second part of the analysis in this chapter focuses on those individuals who experience sub-optimal labour market outcomes in the form of unemployment or underemployment. For those individuals, the longitudinal nature of HILDA facilitates analysis of employment transitions over time. For example, it is possible that an unemployed individual may transition into employment in subsequent periods, or, alternatively, move out of the labour force and be characterised as NILF. These transitions between alternative labour markets states are considered in the second part of this chapter. We present results from a series of multinomial transition models that examine these transitions across consecutive waves of HILDA. Again, the primary focus is on the way in which such transitions differ across individuals in alternative tenures, and the role of geographic mobility in facilitating such transitions.

6.1 Empirical research on geographic and job mobility

The first set of statistical estimates here consider the job mobility and geographic mobility experienced by individuals who report being employed across consecutive waves of HILDA. There are a limited number of studies that have examined both job mobility and residential mobility in this manner. Kan (2003) is one such paper, though the focus of that analysis is the role that attitudes to risk play on decisions regarding job and residential mobility. Notably, Kan finds that risk aversion is more important when considering changes that involve *both* geographic mobility and job changes. A more recent study of job and residential mobility by Kronenberg and Carree (2012) examines the behaviour of full-time employees in the Netherlands in 2003–04. The analysis in that paper finds that geographic mobility decisions are strongly influenced by familial and job-related ties, along with career opportunities. It is notable that the analysis in that paper identified that long commutes were positively related to both job and residential mobility decisions. Kim (2014) adopts a somewhat different approach, by focusing on mobility at the aggregate level. In particular, there is evidence that job mobility has a positive impact on residential mobility flows, while the reverse relationship is not as strong. Significantly, housing market considerations were found to be particularly important in influencing geographic mobility decisions.

6.2 Analysis of residential and job mobility

The results of the statistical analysis of geographic *and* job mobility is reported in Table 8. The results presented show a selected set of tenure variables from a multinomial probit

specification in which four possible changes were identified across consecutive waves of HILDA. As noted above, for individuals employed across consecutive waves of HILDA it is possible to identify the following transitions:

- no change in residential location (i.e. no geographic mobility) and no job change (i.e. no job mobility)
- geographic (residential) mobility but no job change
- a job change but no geographic mobility
- a job change *and* geographic mobility.

Two specifications are reported in Table 8, with geographic mobility alternatively defined as: any move; and a move across SA3 boundaries.

The results from the analysis that uses 'any move' as a measure of geographic mobility are reported in the top panel of Table 8, while the results for mobility 'across SA3 boundaries' are reported in the lower panel. As noted, previous studies have argued that commuting time is likely to be an important consideration in determining whether or not an individual moves residence and or between jobs. Hence, in addition to the tenure variables, a measure of the individual's weekly commuting time is included in the empirical specifications, and the estimated marginal effects are reported in Table 8.

The analysis points to the association between tenure and mobility being significant in a number of instances. The key finding from the analysis is that, again, it is those in private rental accommodation who exhibit the greatest mobility. Being in private rental is associated with a significantly lower probability that the individual reports 'No move and no job change'. The marginal effect in this case is -0.148 in the upper panel, indicating that private renters are approximately 15 per cent less likely to report 'No move and no job change' compared to outright owners (the omitted group). Conversely, in the top panel, being in private rental accommodation is associated with significantly higher probabilities of reporting a 'Move but no job change' and a 'Move and change jobs'. Such a pattern is consistent with the far greater flexibility that individuals in private rental accommodation exhibit vis-à-vis owner-occupiers, and is consistent with the results reported in Chapter 2. Interestingly, relative to owner-occupiers, social renters are less likely to report 'No move and no job change' and more likely to report a 'Move and job change', suggesting that public housing does not curtail the ability of employed individuals to move across jobs. Finally, owner-occupiers with high LVRs are more likely to report a job change without geographical relocation ('No move but change jobs') than those with lower LVRs. Following the discussion in earlier chapters, this likely reflects the relatively high costs associated with geographic mobility for this group.

Two other points are noteworthy from the results reported in Table 8. First, as expected, longer commutes are associated with a lower probability of 'No move and no job change' and a higher probability of 'No move but change jobs'. Note, for example, that in the upper and lower panels, the negative (and significant) coefficient on the 'Commute' variable on the 'No move and no job change' outcome. Second, the patterns reported in the lower panel of Table 8, where geographic mobility is considered to be a move across an SA3 boundary, indicate similar if not slightly stronger results in some instances. For example, owners with high LVRs are less likely to exhibit 'No move and no job change' compared to owner-occupiers with a low LVR and outright owners.

Table 8: Residential and job mobility

	LVR<0.5	0.5≤LVR≤0.8	LVR>0.8	Private renters	Social renters	Rent- free	Commute
<i>Any move</i>							
No move and no job change	0.002 (0.005)	-0.014* (0.007)	-0.011 (0.008)	-0.148*** (0.007)	-0.048*** (0.015)	-0.082*** (0.012)	-0.002*** (0.000)
Move but no job change	-0.007 (0.003)	-0.000 (0.005)	-0.009 (0.006)	0.113*** (0.004)	0.049*** (0.009)	0.085*** (0.007)	0.001* (0.000)
No move but change jobs	0.006 (0.004)	0.010* (0.005)	0.018** (0.006)	0.008 (0.005)	-0.010 (0.012)	-0.025** (0.010)	0.002*** (0.000)
Move and change jobs	-0.001 (0.002)	0.004 (0.002)	0.002 (0.003)	0.027*** (0.002)	0.009* (0.004)	0.021*** (0.003)	0.000 (0.000)
<i>SA3</i>							
No move and no job change	0.001 (0.005)	-0.015** (0.006)	-0.018** (0.007)	-0.068*** (0.006)	-0.019 (0.013)	-0.033*** (0.010)	-0.003*** (0.000)
Move but no job change	-0.006* (0.003)	0.000 (0.003)	-0.002 (0.004)	0.033*** (0.003)	0.019*** (0.005)	0.031*** (0.004)	0.001*** (0.000)
No move but change jobs	0.005 (0.005)	0.011* (0.005)	0.018*** (0.006)	0.018*** (0.005)	-0.005 (0.012)	-0.012 (0.009)	0.002*** (0.000)
Move and change jobs	-0.000 (0.002)	0.003 (0.002)	0.002 (0.002)	0.016*** (0.002)	0.005 (0.003)	0.014*** (0.002)	0.000*** (0.000)

*Note: Coefficients reported in Table 8 are marginal effects and associated standard errors from a multinomial probit specification. The base or omitted category is the outright home owner. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Full results are presented in Appendix 2. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

6.3 Analysis of labour market transitions

The final set of regression results, reported in Table 9, considers transitions between labour market states for individuals who identify themselves as unemployed or underemployed in HILDA. In particular, for those individuals who are unemployed or underemployed in any given wave of HILDA, it is possible that they report being in one of the following 'labour market states' in the following wave:

- employed
- unemployed
- not in the labour force (NILF)
- underemployed.

A series of multinomial regression models are used to identify the correlates of transitions across alternative labour market states. Of particular interest for this study is the relationship between tenure and labour market outcomes experienced by those who are initially unemployed or underemployed. Further, given the potential role that geographic mobility may play in

facilitating labour market adjustment, the empirical specifications include a measure of whether the individual reports being geographically mobile across consecutive waves of HILDA. A selected set of results are presented in Table 9, while full results are included in Appendix 2.

Table 9: Labour market transitions, t to $(t+1)$

	LVR<0.5	0.5≤LVR≤0.8	LVR>0.8	Private renters	Social renters	Rent- free	Geographic Mobility
<i>Unemployed at t</i>							
Employed	0.009 (0.040)	0.036 (0.052)	0.000 (0.066)	-0.064 (0.040)	-0.064 (0.047)	-0.011 (0.057)	0.047 (0.025)
Unemployed	-0.017 (0.040)	-0.025 (0.058)	-0.063 (0.070)	0.055 (0.040)	0.042 (0.045)	0.040 (0.055)	-0.042 (0.025)
Not in the labour force	0.012 (0.037)	0.019 (0.050)	0.093 (0.064)	0.017 (0.037)	0.063 (0.043)	0.017 (0.053)	-0.007 (0.024)
Underemployed	-0.003 (0.026)	-0.030 (0.035)	-0.031 (0.044)	-0.008 (0.026)	-0.041 (0.032)	-0.045 (0.040)	0.000 (0.018)
<i>Underemployed at t</i>							
Employed	0.032 (0.025)	0.079* (0.032)	0.088* (0.041)	0.042 (0.028)	-0.002 (0.043)	0.021 (0.049)	0.000 (0.020)
Unemployed	-0.009 (0.008)	0.000 (0.010)	0.002 (0.012)	-0.001 (0.008)	0.011 (0.010)	-0.008 (0.014)	0.017*** (0.005)
Not in the labour force	0.004 (0.013)	0.015 (0.017)	0.005 (0.022)	-0.002 (0.014)	0.024 (0.020)	0.047 (0.023)*	0.042*** (0.010)
Underemployed	-0.028 (0.024)	-0.094** (0.032)	-0.095* (0.042)	-0.038 (0.028)	-0.033 (0.044)	-0.060 (0.047)	-0.059** (0.019)

*Note: Coefficients reported in Table 9 are marginal effects and associated standard errors from a multinomial probit specification. Other controls in the specification include those for gender, age, education, state of residence and time dummy variables. Full results are presented in Appendix 2. Tenure status is measures at time t . Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Consider first the results presented for the unemployed in the upper panel of Table 9. In general, the results indicate that for the unemployed there is little or no association between labour market transitions and their tenure status. There is some weak evidence that geographic mobility may facilitate a move back into employment, with the estimated marginal effect (0.047) being positive and weakly significant.

In comparison, among the underemployed there is some evidence of an association between tenure and employment transitions. For example, owner-occupiers with LVRs greater than 0.5 exhibit a higher probability of returning to 'adequate employment' and are less likely to report remaining in underemployment in period $(t+1)$. At the same time, for the underemployed, geographic mobility across waves of HILDA is associated with moves into unemployment and out of the labour force, with the marginal effects equalling 0.017 and 0.042 respectively. That is, in both cases geographic mobility across waves of HILDA for the underemployed is associated with a *higher* likelihood that the individual reports being unemployed or NILF in the following

period. This suggests that it is possible, for example, that geographic mobility does not facilitate transitions to better labour market outcomes for this group.

The analysis presented in Tables 8 and 9 is, by its nature, preliminary and serves to highlight some important mechanisms linking housing and labour markets. A full understanding of these linkages would ideally unpack these relationships and identify the causal mechanisms that connect housing and labour market outcomes.

6.4 Implications for policy development options

The analysis of joint residential mobility and job change decisions tends to reaffirm the analysis reported in Chapter 2. For example, the results in Table 8 highlight the relatively higher mobility of individuals in private rental compared to other forms of tenure. Moreover, that mobility applies to job changes *coupled with* geographic mobility (compared with geographic mobility alone, considered in Chapter 2). The greater mobility on the part of renters also applies to moves across SA3 boundaries. As expected, longer commuting time encourages mobility across jobs and/or geographic location. In terms of labour market transitions, the evidence suggests that the relationship between housing and labour market outcomes is stronger for the underemployed.

The policy implications of the results from this analysis tend to reinforce those described in earlier chapters and are discussed more fully in Chapter 7. One important lesson that policy should acknowledge is that adjustment in labour and housing markets can occur across a range of dimensions. Individuals can, for example, change jobs without residential mobility. The analysis reported in Table 8 highlights that reduced commute times are likely to be an important motivation for such changes. Similarly, for those experiencing sub-optimal outcomes in the labour market, geographic mobility may, but will not *necessarily*, lead to improved labour market outcomes. The results in Table 9, for example, suggest that among the underemployed geographic mobility is not necessarily associated with greater engagement in the labour market. Indeed, as the discussion in Chapter 2 highlighted, such decisions are likely to reflect a range of considerations around life-cycle factors and housing costs, among other things.

Ideally, fiscal policy and income support measures will facilitate the efficient allocation of resources, including labour, across the economy. In the context of owner-occupiers, this is likely to require that impediments to geographic mobility are minimised. For those who are in receipt of housing assistance measures, on the other hand, this is likely to require that rules associated with transfer programs do not diminish the incentive to move and engage in the labour market.

7 Policy development options

This project is part of a broader Inquiry examining how economic growth can be promoted through housing and related policy measures. The focus of this report has been on the relationship between housing and labour markets. Rather than providing a detailed comparative review of policy options across different jurisdictions or testing different policy settings or scenarios, the analysis in this project has sought to provide insights into some key mechanisms through which housing and labour markets are linked. The quantitative analysis was preceded by a review of the national and international literature. This discussion shaped the statistical analysis that was conducted and provided a conceptual framework that informed the analysis.

What is the relationship between housing tenure and labour market behaviours and outcomes?

There is a general consensus that housing, and a housing market, that facilitates efficient adjustment in the labour market is conducive to raising living standards over time, or, alternatively, that it will enhance overall efficiency in the economy. The SMH and the Oswald hypotheses provide conceptual frameworks that highlight how housing and labour markets are related. At a micro-economic level, job search models provide a strong theoretical foundation for understanding how housing can shape behaviours and ultimately economic outcomes. These hypotheses and the associated models of behaviour have informed the analysis in this report.

The review of the theoretical literature and existing research provided evidence of the nature of the relationship between housing and the labour market. While there are likely to be a range of mechanisms via which housing impacts on observed labour market behaviours and outcomes, in this report we focus on decisions around geographic mobility, job search and reservation wages.

Recall that the Oswald thesis, as originally formulated, posited a positive relationship between rates of home ownership and the level of unemployment (Oswald 1996). Subsequent theoretical work provided micro-economic foundations for this macro-economic relationship by describing how job search behaviour and the adjustment of reservation wages may or may not lead to outcomes consistent with the macro-economic relationship (Coulson and Fisher 2009). Our analysis seeks to shed light on these relationships and in doing so to provide some insight into the underlying relationships that the Oswald thesis reflects. For example, consistent with the observations of Oswald (1996), individuals in private rental tenures are substantially more likely to exhibit geographic mobility than those in other tenures. In addition, there is some evidence that unemployed mortgagors with low LVRs set higher reservation wages and exhibit lower rates of job search intensity relative to the unemployed in other tenures. Such patterns of behaviour are consistent with home ownership being associated with longer spells of unemployment, and therefore higher rates of unemployment, relative to other forms of tenure.

The SMH, particularly as it has been examined in the Australian context, suggests that job search and matching will be impeded by segmented housing markets that constrain low-income and low-skilled workers to areas with limited employment opportunities (Nouwelandt, Crommelin et al. 2016; Berry 2006). A key contribution of this study is to consider the potential impact of contextual factors, by inclusion in the empirical specifications of small area-based measures of housing costs, unemployment and commuting time. The research therefore extends the analysis of studies informed by the Oswald thesis that have framed the relationship between housing and labour adjustment purely in terms of tenure. The findings of this research suggest that area-based housing costs are strongly correlated with residential mobility—and in the context of continued house price growth, particularly in Melbourne and Sydney, this is likely to continue to prompt longer distance moves of lower income households or those experiencing an unexpected shock to their income across regions. The extent to which movement out of regions

with high housing costs impacts upon subsequent labour market adjustment and employment opportunities warrants more detailed investigation.

Ideally, future research should try to unpack the underlying behavioural relationships explored in the empirical analysis, by undertaking structural modelling. Unlike earlier studies, our analysis has been able to distinguish different types of tenures and LVRs among owner-occupiers, in addition to controlling for important contextual issues such as local housing prices and commuting time. An important insight of the SMH is that the optimising decisions of individuals and households are shaped by the contextual and institutional considerations that constrain the set of choices available. Future research should seek to extend the analysis presented in this report and in doing so unpack these relationships in a more robust manner. The richness of the data available in the HILDA dataset is one of its key strengths and further interrogation of that data should provide insight into the underlying causal relationships of interest.

The analysis in this report adds to the relatively limited evidence base around these relationships and in doing so provides a number of novel contributions. Foremost, the analysis controls for tenure with a richer specification that includes: measures of LVRs for mortgagors; the cost of housing to the individual; and housing payment arrears. This is among the first studies to incorporate dimensions of quality of employment more indicative of contemporary labour markets by extending the focus beyond housing and unemployment to underemployment. Furthermore, contextual variables are included in the analysis, including information on the local region level of unemployment and local region housing costs. We also consider the joint moves associated with job mobility and geographic (residential) mobility, in addition to transitions between various labour market states. Finally, we analyse the rich set of information available in the HILDA dataset and incorporate a measure of individual preparedness to take financial risks ('risk aversion') into the mobility specification.

The specific policy implications of the findings in this report are discussed in more detail below. At this point it is important to note that policy-makers have competing objectives to contend with. In some cases, attaining an efficient outcome must be balanced with considerations of equity. For example, assessment of the effectiveness of housing assistance measures across different groups may need to take into account the capacity of recipients to access and maintain both housing and employment in a sustained manner.

In Chapters 1 and 2 of this report there was extensive discussion of the Oswald thesis and the proposition that higher rates of home ownership may lead to higher rates of unemployment through a variety of mechanisms. One important consideration in this regard is the costs associated with geographic mobility for home owners. In general, these costs will be higher because liquidity constraints in the housing market means that their disposal and the purchase of a new residence will generally involve relatively high transaction costs. In the case of Australia, it is generally acknowledged that tax policy settings, especially around stamp duty, impose additional costs over and above what would be incurred if the tax system was made more efficient (e.g. through the imposition of a broad-based land tax).

While it is accepted that high rates of home ownership may reduce geographic mobility relative to that which would prevail in the absence of this form of tenure, this must be balanced against the benefits that home ownership provides. There is an extensive body of literature suggesting that ownership provides direct benefits to the owner and external benefits to society more generally (Dietz and Haurin 2003). These perceived benefits of home ownership in Australia are explicitly and implicitly acknowledged through the preferential treatment that this form of tenure receives in the tax and transfer system. Although ownership remains the dominant form of tenure in Australia, there is evidence that it is perhaps less stable than was previously the case (Wood, Smith et al. 2013). One potentially important question for policy in this context is how to accommodate the mix of tenure choices that individuals face over the life cycle in a sustainable manner.

In the case of other forms of tenure, in particular private and social renting, the key question that this research addresses is how policy settings can be specified so that individuals living within these forms of tenure can take advantage of opportunities in the labour market and respond to challenges such as those associated with labour market shocks like unemployment or underemployment. While public housing provides security of tenure and the benefits that it entails for those wishing to engage in the labour force, there is broad recognition that exit out of unemployment is more readily achieved by those who have the flexibility afforded by renting in the private market. Moreover, CRA enhances this flexibility for private renters by ensuring that their housing assistance is not location specific. At the same time, lower income renters may face considerable barriers when competing in the private rental sector that subsidies alone cannot overcome. Housing policy has a role to play in ensuring the prevention of homelessness, and its long-term costs to individuals and society, through the provision of secure and long-term affordable housing options (Johnson, Kuehnle et al. 2015; Stone, Parkinson et al. 2016; Parkinson 2015).

Within the context of these competing considerations, the analysis presents a variety of policy options, which are considered below.

7.1 Geographic mobility of households across tenures

How do geographic mobility patterns differ across tenure types?

What are the implications of these patterns for policy?

The analyses in Chapters 2, 3 and 6 directly address the question of geographic mobility, a key consideration in the efficient functioning of the labour market and the economy more generally. Policy implications of the analysis in Chapters 3 and 6 are dealt with in more detail below. The focus here is on the implications of the analysis in Chapter 2.

Broadly speaking, the analysis in Chapter 2 highlighted the greater geographic mobility of individuals and households in private rental tenure. This result *per se* is not novel, though the rich set of covariates that were applied to the analysis provides additional insight over and above that which has been available in earlier studies. For example, there is evidence that the underemployed, a group that is larger in size than the unemployed, exhibit similar geographic mobility patterns to that group. Moreover, there is evidence that local unemployment rates are unrelated to patterns of geographic mobility, whereas mobility is more likely when house prices are high in the individual's local area.

From a policy perspective, the analysis in this report highlights a number of key areas where policy settings can likely make a difference and enhance the role of housing and housing markets in the efficient functioning of the labour market.

7.1.1 Fiscal measures

There is broad agreement that the reliance of all state and territory governments (with the exception of the ACT) on stamp duties imposes additional costs on owner-occupiers seeking to move.²¹ The theoretical literature points to the use of a broad-based land tax as a far more efficient means by which to raise revenue, while enhancing the geographic mobility of owners. The analysis in this report highlights that, as a group, owner-occupiers have relatively lower rates of geographic mobility compared to those in private rental tenure.

²¹ As noted in Chapter 2, the ACT government is in fact moving towards a broad based land tax.

Current fiscal settings provide a range of implicit and explicit benefits to owner-occupiers. Ideally, taxation policy settings should be 'tenure neutral'. That is, in the absence of some overriding external benefit, taxation policy should in general not favour one form of tenure over another. While there are arguments that owner-occupation provides a broad range of benefits to the individual and economy more generally, the question remains whether the level of support provided through the taxation system for this form of tenure is appropriate. Such questions have been considered in other contexts (e.g. Henry, Harmer 2009) and will not be addressed directly here.

7.1.2 Housing assistance and income support measures

A key issue when considering labour market adjustment is that for those experiencing shocks such as unemployment, publicly funded transfers play an important role in shaping behaviours and outcomes. In Australia, the principal form of housing assistance has increasingly become the CRA program, the benefits and limitations of which have been noted previously in this report. To ensure that transfers such as CRA provide an adequate opportunity to respond to labour market shocks and the housing challenges they present, it is important that they facilitate adjustment on the part of the recipient. The transferable nature of CRA is one of its key advantages. It is possible that such a program could potentially be enhanced if it were to reflect the local housing market conditions more closely. For example, a CRA more specifically tailored to local market housing conditions could possibly enhance the opportunities for unemployed individuals to move to areas that are characterised by better employment prospects but also higher housing costs. The analysis in Chapter 2 provides some limited evidence that local area housing costs are associated with a greater propensity to exhibit geographic mobility. To the extent that such areas also exhibit better employment prospects, a more nuanced CRA program may provide additional opportunities for the unemployed and underemployed.

In a similar vein, it is important that public housing not be structured in a way that limits geographic mobility. The analysis in this paper highlights the substantially lower rates of mobility among social renters compared to those in the private rental market. Arguably, this reflects the pattern whereby public housing has increasingly been occupied by those with the highest needs, who are less able to participate and/or compete for longer term secure jobs (Productivity Commission 2015). The loss of public housing in the event of geographic mobility potentially imposes a large cost on the recipient: the loss of a secure tenure and an income-linked rent. The New South Wales Government, for example, has proposed that social housing should play a more enabling role, by coupling social housing assistance measures with programs designed to build and enhance the skill set of tenants, thereby creating pathways out of social housing over the long term for those with the capacity to take them (NSW Government 2015). The potential to couple social housing assistance with more flexible assistance in private rental markets may provide opportunities and pathways for those who rely on housing assistance to achieve economic independence through engagement in the labour market. There is a recognition, however, that this will require a set of housing and related policies that are complementary and provide support through any transition period.

7.2 Attitudes to risk and geographic mobility

Do attitudes to risk affect geographic mobility and if so, does this differ across tenures?

The analysis in Chapter 3 provides some limited evidence that risk-averse individuals are less likely to exhibit geographic mobility. In some sense, this finding is intuitive and unsurprising—geographic mobility is costly, and risk-averse individuals are likely to be wary of incurring those costs by making a move.

The empirical analysis highlights some important policy challenges. Many of the risks that are associated with geographic mobility can be readily identified and include: uncertainty associated with labour market conditions and quality of employment in the area that an individual is moving to; uncertainty with respect to housing markets and the amenities that are available; and, for home owners, the risks that stem from macro-economic settings that influence housing prices. For some groups, uncertainty might be associated with issues such as the quality of local schools and the ability to move children seamlessly into a new school. In many cases, such risks are idiosyncratic and policy may have little ability to mitigate those risks and facilitate geographic mobility. In other cases, policy settings can potentially play an important role.

How might some of these risks be minimised through policy? To take the example of housing assistance measures, the transferable nature of the CRA program provides a means whereby housing assistance will not be lost if a move occurs. Indeed, the potential loss of support for tenants in social housing or in receipt of location-based housing assistance potentially creates uncertainty that may discourage geographic mobility. In short, a move that entails an uncertain outcome in a new employment market potentially represents a high-risk strategy for those in social housing. While the need to address these challenges has been recognised, it is likely policy responses will require collaborative efforts across different levels of government and strategies to ensure that housing- and employment-related policies are complementary (NSW Government 2015).

Other types of risk can be dealt with through policies at both the micro- and macro-economic levels. For example, development of and moves towards a national school curriculum will reduce the risk that school-aged children may be disadvantaged by an interstate move. Putting aside other potential educational benefits of such a policy, it may be seen as a way to 'unblock' a small impediment to geographic mobility and ultimately adjustment in the labour market. On a macro-economic scale, policy settings that mitigate house price fluctuations reduce the risk associated with moving across distinct housing markets. Indeed, current policy that requires the RBA to achieve low and steady inflation over the course of the business cycle can be seen broadly in this context. Recent experience of house prices suggests that they are prone to significant movements (Figure 2). While it is likely to be beyond the purview of policy-makers to eliminate such fluctuations, minimising them provides the advantage of reducing risk, enabling greater geographic mobility and ultimately a more efficient labour market.

7.3 Variation in job search intensity and reservation wages across tenures

The analysis in Chapters 4 and 5 examines key components of the job search models. In particular, the analysis examines two key issues for the unemployed.

How does job search intensity differ across individuals in different tenure types?

Do reservation wages among the unemployed vary across tenures?

With respect to the first question, the analysis in Chapter 4 finds limited evidence of statistically different patterns across tenure types. Compared with other tenures, search activities were lower among owner-occupiers with low LVRs. Such a result is consistent with a pattern whereby such individuals could draw on accumulated equity to fund job search over a prolonged period of time, though that behaviour was not explicitly tested for.

The fact that job search activities do not differ significantly across tenure types may be interpreted in a positive manner. Job search models compare the benefit associated with continued search (i.e. the prospect of a better match), with a shorter job search resulting in a lower-quality match. The intensity of job search should reflect these considerations, along with

other constraints that the unemployed jobseeker faces, including housing-related constraints. It is possible that among housing assistance recipients who are unemployed and either receiving CRA or resident in social housing, a higher intensity of job search may be considered desirable from a policy perspective. While it is likely that ALMPs that could support such an outcome are feasible, the existing evidence suggests that such programs would need to be carefully designed to be effective (Feeny, Ong et al. 2008).

Regarding the second question, the analysis indicates that there are differences in the levels of reservation wages across tenure types. Moreover, this is the case even when a range of socio-economic characteristics are controlled for, including the duration of the unemployment spell. The analysis suggests that owner-occupiers have the highest reservation wages, followed by those in private rental tenures and then those in social housing.

It is important to stress that economic theory does not suggest a 'correct' level of job search intensity or reservation wages. Rather, the levels that are undertaken/chosen have implications for the nature of the job match which is made and the duration of unemployment spells. In terms of policy, the neoclassical economic framework highlights the benefits of policies that are 'tenure neutral'—that is, that do not provide different incentives for individuals in one form of tenure over another. In the context of ALMPs that are directed at unemployed individuals, policies that provide support for job search activities and encourage the setting of reservation wages that make the formation of a match likely would be a useful step. As noted by the Productivity Commission (2015) and the New South Wales Government (2015) in the context of social housing tenants, such an outcome would likely require coordination across governments and an integrated approach across policy areas including income support, housing assistance and skills development.

A useful extension of the analysis in this report would be to consider how post-unemployment experiences vary across individuals in different tenures, and to what extent those differences are driven by job search behaviours and reservation wages. Such an analysis could potentially make use of the extensive information available in the HILDA dataset to estimate a series of duration models that examine post-unemployment outcomes in a more rigorous manner. A key limitation with such an approach, however, is that the HILDA data does not necessarily provide extensive detail on some relevant behaviours in-between interviews. Understanding the behaviours of individuals during unemployment spells, and the implications of these behaviours for post-unemployment outcomes, would be a valuable addition to the evidence base.

7.4 Residential and job mobility decisions

In Chapter 6, the analysis considers two sets of 'transitions' across waves of HILDA. The first considers the behaviour of employed individuals and joint geographic (residential) and job mobility decisions. The second focuses on unemployed and underemployed individuals and examined their employment decisions. We posed the following questions.

How do joint decisions around geographical and job mobility differ across tenures?

How do employment transitions for the unemployed and underemployed differ across tenures?

The analysis in Chapter 6 that examined the behaviour of employed individuals was consistent with the patterns identified in Chapter 2—namely the significantly higher rates of geographic mobility exhibited by individuals in private rental tenures. In turn, among owner-occupiers, there was found to be a greater propensity to report job-to-job transitions that involved no geographic mobility.

The analysis of the behaviours of unemployed individuals did not show significant patterns with respect to tenure. For the underemployed, there was some evidence that owner-occupiers with LVRs greater than 0.5 were more likely to return to adequate employment. At the same time, there was some evidence that geographic mobility did not facilitate greater engagement in the labour market for the underemployed or the unemployed. The dynamic between underemployment and housing warrants further investigation. The underemployed represent a relatively large share of the labour force, and though not as acute as unemployment, underemployment nonetheless represents a sub-optimal outcome in the labour market.

From a policy perspective, the implications of the analysis in Chapter 6 serve to reinforce those that arise from the analysis in Chapters 2 and 3. Namely, that housing and labour market policies should, ideally, support and enable adjustment in the labour market at the lowest possible cost. This is likely to include strengthening housing assistance policies such as CRA and social housing programs, but also social assistance policies in a manner that facilitates opportunities for economic participation whilst balancing the need for secure and affordable housing.

7.5 Caveats and future research

The analysis in this report should be seen as a step towards developing an evidence base that can inform policy development by increasing our understanding of the relationship between housing and labour markets. The analysis has focused on some key mechanisms via which housing may impact on adjustments and outcomes in the labour market, especially around issues such as geographic mobility, job search and the determination of reservation wages. In doing so, it has extended existing analytical work and provided some new insights by considering issues such as underemployment and attitudes to risk.

As noted in Chapter 1, analysis of the interrelationship between housing and labour markets presents some important challenges for the empirical researcher. The data that is available is, other than in rare circumstances, non-experimental in nature. This engenders that care be taken when making causal inferences based on the statistical relationships that have been presented in this report. The analysis here has identified a series of stylised patterns in the data and in doing so highlighted some future areas for research. For example, understanding in a quantitative sense how transaction costs for owner-occupiers limit geographic mobility would help inform debate around tax policy and the desirability of transaction taxes such as stamp duty. Similarly, identifying more precisely the enabling role played by CRA in facilitating geographic mobility and adjustment in the labour market would assist in identifying appropriate policy settings. Additional evidence on the impact of housing tenure on job search intensity and reservation wage determination would help inform housing assistance policies and labour market policies more generally.

The HILDA dataset provides a useful starting point for ongoing analysis of the issues discussed here. As demonstrated in this report, the longitudinal nature of the HILDA data provides the opportunity to control for unobserved heterogeneity and allows for the analysis of housing and labour market related transitions over time. Given the detailed information available in the dataset, there is also the potential to adopt strategies used in a number of other studies to facilitate a more structural analysis of the relationships examined in this report, or to adopt statistical techniques that provide better insight into the underlying causal relationships of interest. For example, Morescalchi (2016) discusses the use of a number of instrumental variables that could be used to aid in the identification of the causal relationship between housing tenure and the labour market and related outcomes considered in this report. While the HILDA dataset may prove useful in this regard, coupling administrative databases with additional information on the socio-economic characteristics of individuals and households

could also present opportunities to gain a greater understanding of the underlying mechanisms of interest.

From a policy perspective, it is important to consider the context in which policy must be shaped. As noted in Chapter 1, the past three decades have been associated with significant changes in the labour and housing markets in Australia. It is possible, for example, that the deregulation that has characterised the Australian labour market has resulted in the growth of non-standard, and arguably less secure, employment. Such patterns are likely to have implications for decisions around housing and geographic mobility, among other things. If those decisions can be more fully understood, housing and labour market policy development will be better informed.

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Appendix 1: Summary statistics

Chapter 2—Descriptive statistics

Table A1: Summary statistics, Chapter 2

	All sample	Move	No move	Employed	Unemployed	Under-employed
Individual move	0.144	-	-	0.140	0.231	0.164
Outright owners (omitted)	0.255	0.113	0.279	0.226	0.205	0.225
Mortgagors	0.456	0.253	0.490	0.517	0.259	0.411
Private renters	0.227	0.556	0.171	0.219	0.390	0.294
Social renters	0.039	0.033	0.040	0.016	0.103	0.045
Rent free	0.023	0.044	0.020	0.022	0.042	0.025
Impute financial year market income/10,000	0.046	0.044	0.047	0.059	0.018	0.024
Australian born	0.750	0.751	0.750	0.767	0.663	0.742
Overseas born, English speaking	0.104	0.106	0.104	0.108	0.103	0.091
Overseas born, non-English speaking	0.126	0.112	0.128	0.111	0.168	0.143
Aboriginal and Torres Strait Islander	0.020	0.032	0.018	0.014	0.066	0.024
Couples with children	0.468	0.366	0.485	0.498	0.348	0.465
Couples with children 4 years and under	0.173	0.207	0.168	0.172	0.138	0.166
Couples without children	0.272	0.262	0.273	0.266	0.203	0.203
Lone parents	0.071	0.093	0.067	0.054	0.137	0.133
Lone parents with children 4 years and under	0.014	0.027	0.011	0.007	0.031	0.021
Non-dependent child	0.031	0.038	0.029	0.028	0.071	0.041
Other family member	0.129	0.018	0.012	0.011	0.032	0.014
Lone person (omitted)	0.133	0.196	0.122	0.130	0.184	0.130
Unrelated to all household members	0.013	0.026	0.011	0.013	0.025	0.013
University	0.275	0.284	0.273	0.317	0.181	0.234
Diploma	0.102	0.098	0.102	0.108	0.082	0.094
Certificate	0.226	0.234	0.225	0.240	0.247	0.237
Year 12	0.126	0.141	0.123	0.123	0.124	0.137
Year 11 (omitted)	0.271	0.243	0.276	0.212	0.366	0.298
Number of bedrooms	0.033	0.030	0.033	0.033	0.030	0.032
Years at residence	0.083	0.038	0.090	0.080	0.059	0.076
No. of persons in the household	0.030	0.028	0.031	0.030	0.029	0.031
Health condition	0.235	0.203	0.238	0.162	0.319	0.243
Employed full-time	0.558	0.586	0.553	0.745	-	-

	All sample	Move	No move	Employed	Unemployed	Under-employed
Employed part-time	0.150	0.114	0.156	0.166	-	-
Unemployed	0.028	0.045	0.025	0.014	-	-
NLF marginally attached	0.053	0.061	0.052	0.013	-	-
NLF not marginally attached	0.150	0.124	0.155	0.020	-	-
Underemployed	0.061	0.069	0.059	0.043	-	-
Male	0.472	0.485	0.470	0.543	0.466	0.287
Female (omitted)	0.538	0.515	0.536	0.457	0.534	0.713
25–34 years	0.251	0.457	0.216	0.265	0.327	0.258
35–44 years	0.287	0.280	0.289	0.308	0.300	0.325
45–54 years	0.272	0.173	0.288	0.288	0.245	0.284
55–64 years (omitted)	0.190	0.089	0.206	0.139	0.128	0.134
<i>Sydney</i>	0.165	0.162	0.166	0.168	0.163	0.148
<i>Balance of NSW</i>	0.130	0.127	0.131	0.123	0.147	0.145
<i>Melbourne</i>	0.176	0.162	0.178	0.184	0.170	0.173
<i>Balance of Victoria</i>	0.071	0.061	0.073	0.069	0.074	0.082
<i>Brisbane</i>	0.094	0.109	0.092	0.098	0.086	0.090
<i>Balance of QLD</i>	0.115	0.148	0.110	0.109	0.132	0.132
<i>Adelaide</i>	0.063	0.050	0.065	0.060	0.058	0.066
<i>Balance of SA</i>	0.029	0.021	0.030	0.027	0.031	0.032
<i>Perth</i>	0.069	0.070	0.069	0.071	0.055	0.053
<i>Balance of WA</i>	0.025	0.024	0.026	0.025	0.017	0.025
<i>Tasmania</i>	0.031	0.029	0.031	0.029	0.035	0.034
<i>Northern Territory</i>	0.008	0.013	0.007	0.010	0.007	0.006
<i>ACT</i>	0.020	0.021	0.020	0.023	0.012	0.013
Time 1	0.077	0.081	0.077	0.072	0.100	0.077
Time 2	0.073	0.080	0.071	0.070	0.082	0.080
Time 3	0.070	0.069	0.070	0.069	0.062	0.074
Time 4	0.070	0.070	0.070	0.069	0.060	0.070
Time 5	0.071	0.066	0.071	0.072	0.061	0.071
Time 6	0.070	0.071	0.070	0.072	0.064	0.064
Time 7	0.070	0.067	0.070	0.073	0.059	0.066
Time 8	0.070	0.067	0.071	0.072	0.057	0.061
Time 9	0.072	0.072	0.072	0.073	0.069	0.070
Time 10	0.074	0.069	0.074	0.074	0.079	0.071
Time 11	0.095	0.093	0.096	0.096	0.095	0.102
Time 12	0.094	0.100	0.093	0.094	0.103	0.095
Time 13	0.095	0.097	0.094	0.094	0.110	0.098
Observations	108,441	15,575	92,866	76,208	3,034	6,575

Notes: The summary statistics reported in Table A1 are for the pooled cross sections in waves 1–14 of the HILDA data set. All means use appropriate sample weights.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Chapter 3 and Chapter 4—Descriptive statistics

Table A2: Summary statistics, job search intensity and reservation wage models

Variable	Mean
Total number of job search activities	2.901
Log reservation wage	2.939
Mortgagor	0.299
Private renter	0.368
Social housing	0.081
Live rent free	0.032
Unemployment rate	5.154
Unemployment duration (weeks)	26.414
Years at residence	6.701
Aged 25–34 years	0.360
Aged 35–44 years	0.297
Aged 45–54 years	0.218
Couples with children	0.379
Couples with children under 4	0.167
Couples without children	0.167
Lone parents	0.120
Lone parents with children under 4	0.032
Non dependent child	0.141
Other family member	0.038
Unrelated to other household members	0.025
Male	0.497
University	0.191
Diploma	0.081
Certificate	0.224
Year 12	0.166
Imputed financial year income/10,000	2.159
Australian born	0.607
Overseas born, English speaking	0.102
Aboriginal/Torres Strait Islander	0.042
Balance of NSW	0.112
Melbourne	0.206
Balance of Victoria	0.053
Brisbane	0.085
Balance of Qld	0.118
Adelaide	0.046
Balance of SA	0.015
Perth	0.062
Balance of WA	0.014
Tasmania	0.023
Northern Territory	0.009
ACT	0.014
Observations	3,459

Notes: The summary statistics reported in Table A2 are for the pooled cross sections in waves 1–14 of the HILDA data set. All means use appropriate sample weights.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Appendix 2: Empirical specifications

Mobility models

The models reported in Chapter 2 use the following specification:

$$M_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 H_{it} + \mu_i + v_{it} \quad (1)$$

Where i indexes individuals and t indexes time: M_{it} is a measure of geographic mobility as described in Chapter 2; X_{it} is a vector of covariates that are assumed to influence geographic mobility; H_{it} is a vector that captures housing tenure and other associated costs of housing; μ_i is a panel level set of random-effects; and v_{it} is an error term which captures all other influences. The models are estimated using Stata 14.

Table A3: Geographic mobility among individuals—regression results

	(1)	(2)	(3)	(4)	(5)	(6)
Mortgagor	-0.059*** (0.018)	-	-	-	-	-
LVR <0.5	-	-0.0682*** (0.020)	-0.068*** (0.020)	-0.068*** (0.020)	-0.0662** (0.021)	-0.041 (0.023)
LVR >=0.5 & <0.8	-	-0.028 (0.022)	-0.025 (0.022)	-0.026 (0.022)	-0.033 (0.024)	0.003 (0.028)
LVR >=0.8	-	-0.084** (0.026)	-0.080** (0.026)	-0.081** (0.026)	-0.087** (0.028)	-0.042 (0.033)
Private renter	0.848*** (0.020)	0.850*** (0.020)	0.847*** (0.020)	0.847*** (0.020)	0.858*** (0.021)	0.88*** (0.023)
Social housing	0.191*** (0.0341)	0.192*** (0.0341)	0.184*** (0.0343)	0.184*** (0.034)	0.190*** (0.038)	0.206*** (0.038)
Rent free	0.684*** (0.034)	0.686*** (0.034)	0.688*** (0.034)	0.688*** (0.034)	0.697*** (0.037)	0.698*** (0.037)
Couples with children	-0.242*** (0.029)	-0.243*** (0.029)	-0.243*** (0.029)	-0.243*** (0.029)	-0.230*** (0.031)	-0.227*** (0.031)
Couples with children < 4 years	0.113*** (0.019)	0.112*** (0.019)	0.113*** (0.019)	0.114*** (0.019)	0.132*** (0.020)	0.133*** (0.020)
Couples without children	-0.070*** (0.020)	-0.070*** (0.020)	-0.070*** (0.020)	-0.070*** (0.020)	-0.063** (0.022)	-0.059** (0.022)
Lone parents	-0.059 (0.030)	-0.059* (0.030)	-0.057 (0.030)	-0.057 (0.030)	-0.045 (0.033)	-0.044 (0.033)
Lone parents with children < 4 years	0.054 (0.046)	0.053 (0.046)	0.054 (0.046)	0.055 (0.046)	0.083 (0.051)	0.084 (0.051)
Non-dependent child	0.264*** (0.037)	0.266*** (0.037)	0.268*** (0.038)	0.268*** (0.038)	0.318*** (0.041)	0.323*** (0.041)
Other family member	0.010 (0.049)	0.009 (0.049)	0.011 (0.049)	0.011 (0.049)	0.007 (0.054)	0.011 (0.054)
Unrelated	0.055 (0.044)	0.054 (0.044)	0.053 (0.044)	0.053 (0.044)	0.081 (0.048)	0.084 (0.048)

	(1)	(2)	(3)	(4)	(5)	(6)
Australian born	0.050* (0.020)	0.050* (0.020)	0.049* (0.020)	0.049* (0.020)	0.046* (0.021)	0.046* (0.021)
Overseas born (Eng. speaking)	0.109*** (0.026)	0.109*** (0.026)	0.107*** (0.026)	0.107*** (0.026)	0.094*** (0.028)	0.095*** (0.028)
Aboriginal and Torres Strait Islander	0.169*** (0.044)	0.170*** (0.044)	0.173*** (0.044)	0.174*** (0.044)	0.097* (0.050)	0.096 (0.050)
Aged 25–34 years	0.458*** (0.023)	0.456*** (0.023)	0.456*** (0.023)	0.456*** (0.023)	0.429*** (0.025)	0.428*** (0.025)
Aged 35–44 years	0.235*** (0.023)	0.234*** (0.023)	0.233*** (0.023)	0.233*** (0.023)	0.216*** (0.024)	0.217*** (0.024)
Aged 45–54 years	0.094*** (0.021)	0.094*** (0.0211)	0.092*** (0.021)	0.092*** (0.021)	0.096*** (0.022)	0.096*** (0.022)
Balance of NSW	0.096*** (0.023)	0.096*** (0.023)	0.104*** (0.024)	0.095*** (0.025)	0.084** (0.026)	0.080** (0.026)
Melbourne	0.015 (0.021)	0.015 (0.021)	0.0184 (0.0211)	0.014 (0.021)	0.011 (0.023)	0.007 (0.023)
Balance of Victoria	0.087** (0.0281)	0.087* (0.0281)	0.099*** (0.029)	0.096** (0.029)	0.092** (0.032)	0.084** (0.032)
Brisbane	0.127*** (0.024)	0.127*** (0.024)	0.136*** (0.025)	0.133*** (0.025)	0.136*** (0.027)	0.133*** (0.027)
Balance of Qld	0.205*** (0.023)	0.205*** (0.023)	0.216*** (0.024)	0.213*** (0.024)	0.207*** (0.026)	0.203*** (0.026)
Adelaide	-0.018 (0.030)	-0.018 (0.030)	-0.004 (0.031)	-0.009 (0.031)	-0.006 (0.033)	-0.011 (0.033)
Balance of SA	-0.044 (0.041)	-0.044 (0.041)	-0.026 (0.042)	-0.031 (0.043)	-0.057 (0.046)	-0.064 (0.046)
Perth	0.102*** (0.027)	0.102*** (0.027)	0.107*** (0.028)	0.106*** (0.028)	0.097*** (0.029)	0.093** (0.029)
Balance of WA	0.127** (0.041)	0.127** (0.041)	0.118** (0.041)	0.115** (0.041)	0.0976* (0.044)	0.0909* (0.044)
Tasmania	0.063 (0.038)	0.062 (0.038)	0.077 (0.040)	0.067 (0.040)	0.061 (0.042)	0.054 (0.042)
Northern Territory	0.291*** (0.061)	0.291*** (0.061)	0.310*** (0.062)	0.310*** (0.062)	0.320*** (0.065)	0.320*** (0.065)
ACT	0.112* (0.044)	0.112* (0.044)	0.114** (0.044)	0.117** (0.044)	0.130** (0.046)	0.129** (0.046)
University	0.079*** (0.018)	0.080*** (0.018)	0.072*** (0.019)	0.073*** (0.019)	0.072*** (0.020)	0.074*** (0.020)
Diploma	0.071** (0.023)	0.071** (0.023)	0.068** (0.023)	0.068** (0.023)	0.070** (0.025)	0.071** (0.025)
Certificate	0.058** (0.018)	0.058** (0.018)	0.054** (0.018)	0.055** (0.018)	0.056** (0.019)	0.056** (0.019)
Year 12	0.022 (0.021)	0.022 (0.021)	0.017 (0.021)	0.018 (0.021)	0.013 (0.023)	0.014 (0.023)

	(1)	(2)	(3)	(4)	(5)	(6)
Number of bedrooms	-0.053*** (0.007)	-0.053*** (0.007)	-0.053*** (0.007)	-0.054*** (0.007)	-0.054*** (0.007)	-0.052*** (0.007)
Years at residence	-0.016*** (0.001)	-0.015*** (0.001)	-0.015*** (0.001)	-0.015*** (0.001)	-0.016*** (0.001)	-0.016*** (0.001)
No. of persons in household	0.017* (0.007)	0.017* (0.007)	0.018* (0.007)	0.018* (0.007)	0.012 (0.008)	0.012 (0.008)
Employed part-time	-0.043* (0.019)	-0.043* (0.019)	-0.042* (0.019)	-0.042* (0.019)	-0.037 (0.020)	-0.036 (0.020)
Unemployed	0.085** (0.031)	0.086** (0.031)	0.088** (0.0306)	0.088** (0.031)	0.053 (0.034)	0.053 (0.034)
NLF marginally attached	-0.021 (0.026)	-0.020 (0.026)	-0.0208 (0.026)	-0.021 (0.026)	-0.028 (0.028)	-0.027 (0.028)
NLF not marg. attached	-0.030 (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.025 (0.022)	-0.024 (0.022)
Underemployed	-0.000 (0.024)	0.000 (0.024)	0.002 (0.024)	0.002 (0.024)	-0.011 (0.025)	-0.011 (0.026)
Male	-0.026 (0.014)	-0.026 (0.014)	-0.025 (0.014)	-0.025 (0.014)	-0.032* (0.015)	-0.033* (0.015)
Health condition	-0.010 (0.015)	-0.010 (0.015)	-0.010 (0.015)	-0.0101 (0.015)	-0.010 (0.016)	-0.011 (0.016)
Financial year income/10,000	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.006*** (0.001)	0.007*** (0.001)
Local area house value SA3/100,000	-	-	0.005 (0.003)	0.005 (0.003)	0.007* (0.003)	0.009** (0.003)
Unemployment rate (SA4)	-	-	-	0.005 (0.003)	0.006 (0.003)	0.006 (0.003)
Arrears in rent/ mortgage	-	-	-	-	0.051* (0.021)	0.052* (0.021)
Actual housing cost/100 (monthly)	-	-	-	-	-	-0.002** (0.001)
Constant	-1.553*** (0.047)	-1.554*** (0.047)	-1.589*** (0.051)	-1.614*** (0.053)	-1.622*** (0.058)	-1.634*** (0.058)
$\ln(\sigma_\theta^2)$	-2.275*** (0.066)	-2.276*** (0.066)	-2.273*** (0.066)	-2.273*** (0.066)	-2.300*** (0.074)	-2.290*** (0.074)
Observations	108,441	108,441	108,275	108,275	96,128	96,107

Notes: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Table A4: Inter-SA2, inter-SA3 and interstate mobility among individuals—regression results

	Move SA2	Move SA3	Move state
LVR <0.5	-0.056* (0.026)	-0.064* (0.029)	0.028 (0.057)
LVR >=0.5 & <0.8	-0.001 (0.031)	0.019 (0.035)	0.156* (0.065)
LVR >=0.8	-0.0463 (0.037)	-0.031 (0.042)	0.014 (0.079)
Private renter	0.711*** (0.026)	0.598*** (0.029)	0.499*** (0.055)
Social housing	0.109* (0.043)	0.0923 (0.049)	0.213* (0.092)
Rent free	0.590*** (0.040)	0.534*** (0.045)	0.433*** (0.082)
Couples with children	-0.243*** (0.034)	-0.298*** (0.039)	-0.219** (0.076)
Couples with children < 4 years	0.141*** (0.023)	0.152*** (0.026)	0.194*** (0.049)
Couples without children	-0.059* (0.024)	-0.059* (0.0262)	0.053 (0.048)
Lone parents	-0.076* (0.036)	-0.145*** (0.041)	-0.227** (0.083)
Lone parents with children < 4 years	0.054 (0.056)	-0.0135 (0.065)	-0.0787 (0.138)
Non-dependent child	0.324*** (0.044)	0.290*** (0.049)	0.087 (0.103)
Other family member	0.069 (0.058)	-0.004 (0.065)	-0.368* (0.159)
Unrelated	0.018 (0.0520)	0.056 (0.0560)	-0.087 (0.109)
Australian born	0.0600* (0.0234)	0.0541* (0.0262)	0.059 (0.051)
Overseas born (Eng. speaking)	0.097** (0.031)	0.0840* (0.0345)	0.087 (0.066)
Aboriginal and Torres Strait Islander	0.074 (0.055)	0.111 (0.062)	0.034 (0.119)
Aged 25–34 years	0.413*** (0.0273)	0.390*** (0.031)	0.309*** (0.058)
Aged 35–44 years	0.194*** (0.027)	0.178*** (0.030)	0.150** (0.057)

	Move SA2	Move SA3	Move state
Aged 45–54 years	0.0812** (0.025)	0.088** (0.028)	0.110* (0.054)
Balance of NSW	-0.0970** (0.030)	-0.178*** (0.034)	0.320*** (0.058)
Melbourne	0.0384 (0.025)	0.043 (0.0271)	-0.091 (0.055)
Balance of Victoria	-0.071 (0.036)	-0.219** (0.043)	0.183* (0.073)
Brisbane	0.178*** (0.029)	0.198*** (0.032)	0.034 (0.063)
Balance of Qld	0.154*** (0.028)	0.042 (0.032)	0.147* (0.059)
Adelaide	0.047 (0.035)	0.061 (0.039)	0.111 (0.075)
Balance of SA	-0.242*** (0.054)	-0.355*** (0.065)	0.087 (0.106)
Perth	0.135*** (0.032)	0.106** (0.035)	0.002 (0.070)
Balance of WA	0.029 (0.049)	0.016 (0.055)	0.382*** (0.092)
Tasmania	0.069 (0.046)	-0.112* (0.055)	0.276** (0.088)
Northern Territory	0.459*** (0.066)	0.370*** (0.073)	0.903*** (0.098)
ACT	0.220*** (0.049)	0.063 (0.056)	0.563*** (0.080)
University	0.109*** (0.022)	0.152*** (0.025)	0.205*** (0.046)
Diploma	0.085** (0.027)	0.111*** (0.031)	0.107 (0.058)
Certificate	0.062** (0.021)	0.065** (0.025)	0.076 (0.046)
Year 12	0.042 (0.025)	0.065* (0.029)	-0.017 (0.056)
Number of bedrooms	-0.042*** (0.008)	-0.039*** (0.009)	-0.046** (0.017)
Years at residence	-0.016*** (0.001)	-0.015*** (0.001)	-0.020*** (0.003)
Number of persons in household	-0.006 (0.009)	-0.010 (0.010)	-0.030 (0.020)

	Move SA2	Move SA3	Move state
Employed part-time	-0.050* (0.022)	-0.041 (0.025)	0.046 (0.045)
Unemployed	0.068 (0.037)	0.103* (0.040)	0.108 (0.074)
NLF marginally attached	-0.006 (0.031)	0.015 (0.035)	0.097 (0.064)
NLF not marginally attached	-0.032 (0.024)	-0.008 (0.027)	0.062 (0.050)
Underemployed	-0.002 (0.028)	0.006 (0.031)	0.025 (0.059)
Male	-0.041* (0.016)	-0.025 (0.018)	-0.013 (0.034)
Health condition	-0.011 (0.020)	-0.006 (0.017)	-0.012 (0.037)
Imputed financial year income/ 10,000	0.005** (0.002)	0.004* (0.002)	0.006 (0.003)
Local area house value SA3/100,000	0.013*** (0.003)	0.0202*** (0.004)	0.011 (0.007)
SA4 unemployment rate	0.006 (0.004)	0.000 (0.004)	-0.003 (0.008)
Arrears in rent/mortgage	0.045 (0.023)	0.035 (0.026)	0.018 (0.049)
Actual housing cost/100 (monthly)	-0.002** (0.001)	-0.003** (0.001)	-0.000 (0.002)
Constant	-1.742*** (0.063)	-1.886*** (0.071)	-2.996*** (0.138)
$\ln(\sigma_{\theta}^2)$	-2.159*** (0.075)	-1.876*** (0.072)	-1.072*** (0.099)
Observations	96,107	96,107	96,107

*Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Table A5: Geographic mobility among the unemployed and underemployed—regression results

	Unemployed		Underemployed			
	Any move	Move SA3	Any move	Move SA3	Any move	Move SA3
LVR <0.5	-0.230 (0.146)	-0.615** (0.199)	-0.377 (0.438)	-0.046 (0.090)	-0.121 (0.111)	0.310 (0.341)
LVR >=0.5 & <0.8	-0.274 (0.177)	-0.361 (0.210)	-0.303 (0.485)	0.063 (0.115)	-0.069 (0.144)	0.758* (0.368)
LVR >=0.8	-0.240 (0.227)	-0.131 (0.251)	0.033 (0.528)	0.036 (0.141)	-0.017 (0.174)	0.649 (0.424)
Private renter	0.668*** (0.125)	0.313* (0.138)	0.208 (0.314)	0.814*** (0.091)	0.508*** (0.105)	0.899** (0.326)
Social housing	0.029 (0.154)	-0.005 (0.172)	0.250 (0.389)	0.125 (0.133)	-0.186 (0.177)	0.339 (0.451)
Rent free	0.396* (0.182)	0.436* (0.191)	0.317 (0.437)	0.706*** (0.138)	0.389* (0.165)	0.904* (0.390)
Imputed financial year income/10,000	-0.014 (0.010)	0.003 (0.012)	0.032 (0.027)	0.005 (0.009)	-0.012 (0.011)	0.007 (0.023)
Local area house value SA3/100,000	-0.002 (0.018)	0.022 (0.019)	-0.017 (0.050)	0.022 (0.012)	0.032* (0.013)	0.021 (0.030)
SA4 unemployment rate	-0.013 (0.019)	-0.037 (0.022)	-0.052 (0.048)	0.023 (0.012)	-0.003 (0.015)	-0.013 (0.033)
Arrears in rent/ mortgage	0.006 (0.087)	0.021 (0.096)	0.306 (0.218)	0.055 (0.065)	-0.050 (0.079)	-0.176 (0.176)
Actual House cost/100 (monthly)	0.002 (0.004)	-0.000 (0.005)	0.002 (0.011)	-0.001 (0.004)	-0.001 (0.005)	-0.003 (0.010)
Couples with children	-0.275 (0.163)	-0.275 (0.181)	0.0463 (0.447)	-0.371*** (0.113)	-0.391** (0.137)	-0.380 (0.317)
Couples with children < 4 years	0.058 (0.125)	-0.088 (0.142)	-0.016 (0.333)	0.117 (0.074)	0.032 (0.093)	0.111 (0.202)
Couples without children	-0.070 (0.118)	-0.207 (0.130)	0.623 (0.337)	-0.217** (0.083)	-0.207* (0.0945)	-0.104 (0.201)
Lone parents	-0.140 (0.151)	-0.200 (0.170)	0.346 (0.415)	-0.279** (0.103)	-0.282* (0.124)	-0.397 (0.278)
Lone parents with children < 4 years	0.172 (0.207)	0.235 (0.220)	0.264 (0.453)	0.308* (0.150)	0.0115 (0.185)	0.035 (0.419)
Non-depend. child	0.182 (0.175)	-0.190 (0.206)	0.773 (0.473)	0.0221 (0.139)	-0.066 (0.162)	-

	Unemployed		Underemployed			
	Any move	Move SA3	Any move	Move SA3	Any move	Move SA3
Other family member	-0.205 (0.218)	-0.181 (0.237)	-	-0.191 (0.193)	-0.280 (0.232)	-
Unrelated to others in household	0.185 (0.214)	0.223 (0.222)	0.0351 (0.651)	0.137 (0.179)	-0.000 (0.199)	-0.151 (0.432)
Australian born	0.222* (0.105)	0.205 (0.116)	-0.326 (0.255)	-0.044 (0.066)	0.038 (0.079)	0.111 (0.182)
Overseas born (Eng. speak)	-0.044 (0.146)	-0.028 (0.161)	-0.296 (0.360)	-0.084 (0.098)	-0.0162 (0.115)	0.143 (0.260)
Aboriginal and Torres Strait Islander	0.046 (0.174)	0.087 (0.189)	-1.242* (0.608)	0.051 (0.150)	-0.131 (0.201)	0.059 (0.423)
Aged 25–34 years	0.445** (0.142)	0.227 (0.154)	0.253 (0.360)	0.359*** (0.0931)	0.268* (0.108)	0.283 (0.278)
Aged 35–44 years	0.290* (0.138)	0.156 (0.151)	-0.001 (0.362)	0.116 (0.091)	0.0271 (0.107)	0.106 (0.282)
Aged 45–54 years	0.171 (0.140)	0.041 (0.154)	-0.123 (0.381)	0.099 (0.089)	0.054 (0.105)	0.380 (0.277)
Balance NSW	0.151 (0.135)	0.112 (0.149)	1.118** (0.393)	0.035 (0.094)	-0.203 (0.117)	0.281 (0.241)
Melbourne	-0.065 (0.125)	-0.020 (0.138)	0.140 (0.370)	0.121 (0.084)	0.158 (0.097)	0.080 (0.225)
Balance Vic.	0.239 (0.160)	0.200 (0.176)	0.924* (0.413)	0.130 (0.110)	-0.200 (0.147)	-0.141 (0.335)
Brisbane	0.049 (0.145)	0.187 (0.153)	0.350 (0.406)	0.067 (0.101)	0.217 (0.114)	-0.050 (0.278)
Balance Qld	0.207 (0.131)	0.121 (0.143)	0.653 (0.365)	0.214* (0.092)	0.090 (0.109)	0.148 (0.246)
Adelaide	0.181 (0.167)	0.240 (0.179)	0.370 (0.466)	0.117 (0.113)	0.350** (0.126)	0.176 (0.294)
Balance SA	0.022 (0.236)	-0.126 (0.287)	0.588 (0.645)	0.147 (0.145)	0.040 (0.180)	0.451 (0.355)
Perth	-0.032 (0.172)	0.057 (0.189)	-0.074 (0.608)	0.163 (0.112)	0.175 (0.129)	-0.014 (0.313)
Balance WA	0.009 (0.272)	0.338 (0.269)	0.687 (0.646)	-0.338 (0.196)	-0.217 (0.226)	-
Tasmania	0.091 (0.212)	-0.110 (0.252)	0.810 (0.556)	0.161 (0.138)	-0.187 (0.188)	0.605 (0.310)

	Unemployed		Underemployed			
	Any move	Move SA3	Any move	Move SA3	Any move	Move SA3
Northern Territory	-0.126 (0.410)	-0.214 (0.457)	0.209 (0.831)	0.327 (0.256)	0.061 (0.324)	0.901* (0.447)
ACT	0.036 (0.337)	-0.641 (0.504)	- (0.201)	0.260 (0.223)	0.311 (0.454)	0.463 (0.454)
University	0.248* (0.109)	0.363** (0.118)	0.282 (0.293)	-0.021 (0.067)	0.059 (0.081)	0.304 (0.186)
Diploma	0.132 (0.134)	0.056 (0.153)	0.112 (0.372)	-0.029 (0.087)	0.149 (0.101)	0.340 (0.222)
Certificate	0.075 (0.091)	0.042 (0.101)	0.240 (0.230)	-0.027 (0.063)	0.008 (0.078)	0.186 (0.178)
Year 12	0.121 (0.115)	0.050 (0.130)	0.140 (0.299)	-0.073 (0.075)	-0.001 (0.091)	-0.043 (0.223)
Numbers of bedroom	-0.070 (0.040)	-0.0689 (0.0447)	-0.306** (0.113)	-0.022 (0.0270)	-0.023 (0.033)	-0.135 (0.075)
Years at address	-0.040*** (0.007)	-0.038*** (0.009)	-0.042 (0.026)	-0.024*** (0.004)	-0.026*** (0.005)	-0.052** (0.019)
Number of persons	0.037 (0.038)	0.066 (0.042)	0.184 (0.095)	0.042 (0.028)	0.008 (0.036)	0.044 (0.083)
Male	-0.091 (0.075)	-0.002 (0.0825)	-0.158 (0.198)	-0.0145 (0.052)	0.0372 (0.062)	-0.059 (0.138)
Health condition	-0.005 (0.075)	-0.044 (0.084)	-0.193 (0.208)	0.0213 (0.054)	0.006 (0.065)	-0.061 (0.148)
Constant	-1.237*** (0.294)	-1.414*** (0.325)	-2.744** (0.860)	-1.668*** (0.210)	-1.634*** (0.246)	-3.410*** (0.658)
$\ln(\sigma_{\theta}^2)$	-1.895** (0.612)	-3.076 (2.429)	-0.543 (0.844)	-3.970 (2.280)	-12.84 (16.53)	-0.958 (0.649)
Observations	2,562	2,562	2,448	5,789	5,789	5,326

Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Table A6: Inter-SA2, inter-SA3 and interstate mobility among married couple households—regression results

	Any move	Move SA2	Move SA3	Move state
LVR <0.5	-0.074 (0.044)	-0.076 (0.050)	-0.056 (0.058)	0.084 (0.111)
LVR >=0.5 & <0.8	-0.031 (0.054)	0.0148 (0.061)	0.0578 (0.070)	0.321* (0.128)
LVR >=0.8	-0.043 (0.066)	-0.004 (0.074)	0.020 (0.0861)	0.080 (0.162)
Private renter	1.036*** (0.049)	0.866*** (0.054)	0.781*** (0.061)	0.781*** (0.114)
Social housing	0.496*** (0.103)	0.357** (0.118)	0.459*** (0.129)	0.642** (0.210)
Rent free	0.773*** (0.078)	0.647*** (0.087)	0.581*** (0.098)	0.374* (0.185)
Couples with children	-0.073 (0.046)	-0.096 (0.052)	-0.152* (0.060)	-0.203 (0.110)
Couples with children < 4 years	0.177*** (0.036)	0.194*** (0.040)	0.193*** (0.047)	0.144 (0.085)
Australian born	0.032 (0.042)	0.061 (0.047)	0.0440 (0.053)	0.238* (0.106)
Overseas born (Eng. speaking)	0.0938 (0.054)	0.110 (0.059)	0.0412 (0.068)	0.228 (0.131)
Aboriginal and Torres Strait Islander	0.056 (0.139)	-0.148 (0.172)	-0.206 (0.210)	0.0152 (0.364)
Aged 25–34 years	0.353*** (0.052)	0.294*** (0.057)	0.245*** (0.064)	0.120 (0.111)
Aged 35–44 years	0.195*** (0.048)	0.138** (0.053)	0.109 (0.061)	-0.0126 (0.108)
Aged 45–54 years	0.098* (0.044)	0.042 (0.049)	0.051 (0.056)	-0.108 (0.102)
Balance of NSW	0.120* (0.054)	-0.0322 (0.061)	-0.166* (0.071)	0.231* (0.117)
Melbourne	0.002 (0.047)	0.0149 (0.052)	-0.020 (0.058)	-0.080 (0.111)
Balance of Victoria	0.107 (0.064)	-0.093 (0.076)	-0.244** (0.091)	0.057 (0.152)
Brisbane	0.157** (0.055)	0.193** (0.059)	0.162* (0.067)	-0.109 (0.133)

	Any move	Move SA2	Move SA3	Move state
Balance of Qld	0.212*** (0.054)	0.164** (0.059)	0.067 (0.068)	0.149 (0.121)
Adelaide	0.009 (0.069)	0.069 (0.074)	0.028 (0.084)	-0.050 (0.162)
Balance of SA	-0.196* (0.095)	-0.307** (0.113)	-0.432** (0.137)	0.093 (0.195)
Perth	0.169** (0.060)	0.172** (0.065)	0.128 (0.073)	-0.040 (0.145)
Balance of WA	0.078 (0.087)	0.058 (0.096)	0.055 (0.107)	0.286 (0.181)
Tasmania	0.081 (0.091)	0.083 (0.101)	0.042 (0.116)	0.228 (0.186)
Northern Territory	0.314* (0.134)	0.452*** (0.136)	0.355* (0.153)	0.879*** (0.201)
ACT	0.090 (0.089)	0.210* (0.0926)	0.134 (0.105)	0.500** (0.155)
University	0.134** (0.043)	0.148** (0.047)	0.151** (0.055)	0.229* (0.100)
Diploma	0.034 (0.053)	0.061 (0.059)	0.0894 (0.068)	0.120 (0.124)
Certificate	0.077 (0.040)	0.059 (0.045)	0.081 (0.053)	0.190* (0.093)
Year 12	0.026 (0.053)	0.056 (0.059)	0.122 (0.067)	-0.165 (0.140)
Number of bedrooms	-0.097*** (0.017)	-0.079*** (0.018)	-0.087*** (0.021)	-0.075* (0.037)
Years at address	-0.013*** (0.002)	-0.015*** (0.003)	-0.017*** (0.003)	-0.024*** (0.006)
Number of persons	-0.045* (0.018)	-0.058** (0.020)	-0.069** (0.023)	-0.059 (0.044)
Female underemployed in household	0.184* (0.090)	0.077 (0.098)	0.052 (0.112)	-0.073 (0.196)
Female unemployed in household	-0.063 (0.089)	-0.033 (0.098)	-0.083 (0.113)	0.059 (0.179)
Male underemployed in household	-0.099 (0.080)	-0.016 (0.085)	-0.026 (0.097)	0.018 (0.165)
Male unemployed in household	-0.025 (0.094)	0.072 (0.100)	0.129 (0.110)	-0.209 (0.240)

	Any move	Move SA2	Move SA3	Move state
Household member NLF	0.013 (0.030)	0.005 (0.034)	0.038 (0.038)	0.055 (0.067)
Health condition	-0.043 (0.034)	-0.040 (0.038)	-0.058 (0.044)	0.027 (0.075)
Imputed financial year market income/10,000	0.007*** (0.002)	0.005 (0.002)	0.0063* (0.003)	0.006 (0.005)
Local area house value SA3/100,000	-0.004 (0.007)	0.009 (0.008)	0.022** (0.008)	0.015 (0.015)
SA4 unemployment rate	-0.006 (0.007)	-0.003 (0.008)	-0.002 (0.009)	0.000 (0.016)
Arrears in rent/mortgage	-0.010 (0.053)	-0.035 (0.0599)	-0.061 (0.070)	-0.141 (0.130)
Actual housing cost/100 (monthly)	-0.008 (0.001)	-0.002 (0.002)	-0.004 (0.002)	-0.002 (0.003)
Constant	-1.410*** (0.118)	-1.585*** (0.131)	-1.687*** (0.149)	-2.843*** (0.282)
$\ln(\sigma_\theta^2)$	-2.648*** (0.221)	-2.585*** (0.241)	-2.096*** (0.198)	-1.344*** (0.254)
Observations	26,521	26,521	26,521	26,521

Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Mobility models with risk attitudes

The models reported in Chapter 3 use the following specification:

$$M_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 H_{it} + \mu_i + \nu_{it} \quad (1)$$

Where i indexes individuals and t indexes time: M_{it} is a measure of geographic mobility as described in Chapter 2; X_{it} is a vector of covariates that are assumed to influence geographic mobility; H_{it} is a vector that captures housing tenure and other associated costs of housing; μ_i is a panel level set of random-effects; and ν_{it} is an error term which captures all other influences. The models are estimated using Stata 14.

Table A7: Geographic mobility and attitudes to risk—regression results

	(1)	(2)	(3)	(4)
LVR <0.5	-0.136** (0.043)	-0.627 (0.328)	-0.119 (0.177)	-0.010 (0.055)
LVR >=0.5 & <0.8	-0.016 (0.050)	-0.212 (0.317)	0.209 (0.217)	0.065 (0.060)
LVR >=0.8	-0.164** (0.059)	0.0437 (0.391)	-0.011 (0.261)	-0.070 (0.071)
Private renter	0.802*** (0.042)	0.517* (0.217)	0.913*** (0.170)	0.869*** (0.052)
Social housing	0.177* (0.070)	-0.015 (0.290)	-0.088 (0.277)	0.332** (0.124)
Rent free	0.654*** (0.063)	0.492 (0.295)	0.860*** (0.219)	0.691*** (0.083)
Imputed financial market year income/10,000	0.007** (0.002)	-0.012 (0.020)	-0.008 (0.015)	0.007** (0.002)
Couples with children	-0.198*** (0.053)	-0.448 (0.287)	-0.594** (0.186)	-0.197*** (0.053)
Couples with children < 4 years	0.139*** (0.037)	0.0470 (0.230)	0.176 (0.130)	0.138*** (0.037)
Couples without children	-0.072 (0.037)	-0.125 (0.218)	-0.475*** (0.144)	-0.074* (0.037)
Lone parents	-0.031 (0.058)	-0.197 (0.296)	-0.399* (0.182)	-0.032 (0.058)
Lone parents with children < 4 years	0.119 (0.093)	0.552 (0.413)	0.018 (0.277)	0.122 (0.093)
Non-dependent child	0.293*** (0.070)	0.317 (0.308)	-0.177 (0.239)	0.289*** (0.070)
Other family member	-0.003 (0.091)	-0.241 (0.431)	-0.538 (0.345)	-0.005 (0.091)
Unrelated to others in household	0.043 (0.091)	-0.014 (0.407)	0.379 (0.355)	0.039 (0.091)
Australian born	-0.018 (0.035)	0.088 (0.197)	0.008 (0.117)	-0.016 (0.035)
Overseas born (Eng. speaking)	0.026 (0.046)	-0.174 (0.266)	-0.032 (0.175)	0.028 (0.046)
Aboriginal and Torres Strait Islander	0.064 (0.080)	0.212 (0.309)	0.138 (0.236)	0.070 (0.080)
Aged 25–34 years	0.455*** (0.042)	0.734** (0.274)	0.322* (0.157)	0.455*** (0.042)
Aged 35–44 years	0.188*** (0.041)	0.281 (0.270)	0.107 (0.153)	0.187*** (0.041)
Aged 45–54 years	0.149*** (0.038)	0.419 (0.269)	0.121 (0.151)	0.150*** (0.038)
Balance of NSW	0.161*** (0.044)	0.232 (0.246)	-0.061 (0.163)	0.159*** (0.044)

	(1)	(2)	(3)	(4)
Melbourne	0.066 (0.037)	-0.041 (0.236)	0.062 (0.141)	0.065 (0.037)
Balance of Victoria	0.149** (0.055)	0.488 (0.287)	-0.012 (0.196)	0.147** (0.055)
Brisbane	0.181*** (0.044)	0.037 (0.253)	0.098 (0.172)	0.180*** (0.044)
Balance of Qld	0.253*** (0.043)	0.298 (0.235)	0.039 (0.158)	0.251*** (0.043)
Adelaide	0.075 (0.054)	0.269 (0.293)	0.224 (0.190)	0.074 (0.054)
Balance of SA	-0.029 (0.087)	0.056 (0.504)	-0.203 (0.299)	-0.029 (0.086)
Perth	0.080 (0.050)	-0.158 (0.340)	0.274 (0.183)	0.075 (0.050)
Balance of WA	0.148 (0.079)	0.225 (0.431)	0.084 (0.316)	0.143 (0.079)
Tasmania	0.022 (0.072)	-0.529 (0.419)	0.125 (0.250)	0.021 (0.072)
Northern Territory	0.390*** (0.010)	0.514 (0.576)	0.602 (0.496)	0.386*** (0.010)
ACT	0.327*** (0.071)	--	0.747* (0.310)	0.325*** (0.071)
University	0.102** (0.035)	0.248 (0.214)	0.173 (0.127)	0.103** (0.035)
Diploma	0.134** (0.043)	-0.162 (0.263)	0.120 (0.161)	0.135** (0.03)
Certificate	0.010** (0.034)	0.036 (0.173)	0.125 (0.116)	0.091** (0.034)
Year 12	0.051 (0.040)	-0.026 (0.222)	0.025 (0.146)	0.052 (0.040)
Number of bedrooms	-0.078*** (0.013)	-0.029 (0.072)	-0.113* (0.046)	-0.076*** (0.013)
Years at address	-0.021*** (0.002)	-0.065*** (0.016)	-0.018** (0.007)	-0.021*** (0.002)
Number of persons	0.006 (0.013)	0.032 (0.061)	0.081 (0.044)	0.006 (0.013)
Employed part-time	-0.017 (0.034)	-	-	-0.018 (0.034)
Unemployed	0.068 (0.059)	-	-	0.070 (0.059)
NLF marginally attached	-0.078 (0.050)	-	-	-0.075 (0.050)
NLF not marginally attached	-0.062 (0.039)	-	-	-0.062 (0.039)

	(1)	(2)	(3)	(4)
Underemployed	0.029 (0.044)	-	-	0.031 (0.044)
Male	-0.079** (0.024) (0.028)	0.110 (0.142) (0.167)	-0.001 (0.091) (0.110)	-0.079** (0.024) (0.028)
Health condition	0.020 (0.028)	0.213 (0.143)	0.102 (0.096)	0.018 (0.028)
Risk aversion	-0.061** (0.023)	0.184 (0.135)	-0.001 (0.085)	0.065 (0.053)
LVR<0.5*averse	-	-	-	-0.082 (0.076)
0.5<LVR<0.8*averse	-	-	-	-0.181* (0.078)
LVR>0.8*averse	-	-	-	-0.218* (0.093)
Private rental*averse	-	-	-	-0.148* (0.062)
Social rental*averse	-	-	-	-0.257 (0.144)
Rent free*averse	-	-	-	-0.094 (0.118)
Local area house value SA3/100,000	0.013** (0.005)	-0.005 (0.031)	0.023 (0.019)	0.013** (0.005)
SA4 unemployment rate	0.000 (0.006)	-0.016 (0.040)	0.024 (0.025)	-0.000 (0.006)
Arrears in rent/mortgage	0.080* (0.039)	0.132 (0.169)	-0.078 (0.125)	0.080* (0.039)
Actual housing cost/100 (monthly)	-0.001 (0.001)	0.003 (0.004)	0.002 (0.006)	-0.001 (0.001)
Constant	-1.474*** (0.099)	-1.448** (0.537)	-1.559*** (0.360)	-1.534*** (0.102)
$\ln(\sigma_{\theta}^2)$	-2.258*** (0.180)	-1.610 (1.223)	-11.940 (31.09)	-2.269*** (0.181)
Observations	31,554	855	1,912	31,554

Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 10 to 14 of HILDA.

Job search intensity models

The models reported in Chapter 3 use the following specification:

$$S_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 H_{it} + v_{it} \quad (1)$$

Where i indexes individuals and t indexes time: S_{it} is a measure of job search intensity; X_{it} is a vector of covariates that are assumed to influence intensity; H_{it} is a vector that captures housing tenure and other associated costs of housing; and v_{it} is an error term which captures all other influences. The models are estimated in Stata 14 using a Poisson regression model that fits the number of occurrences (counts) of an event to the independent variable. Such an approach is more appropriate where the dependent variable—in this case the intensity of job search as measured by the number of job search activities used by the unemployed individual—takes on a small number of discrete values.

Table A8: Job search intensity—regression results

	(1)	(2)	(3)	(4)	(5)
Mortgagor	-0.065* (0.031)	-	-	-	-
LVR <0.5	-	-0.074* (0.035)	-0.074* (0.035)	-0.087** (0.037)	-0.049 (0.042)
LVR >=0.5 & <0.8	-	-0.049 (0.043)	-0.0503 (0.044)	-0.090 (0.046)	-0.032 (0.056)
LVR >=0.8	-	-0.063 (0.052)	-0.064 (0.052)	-0.109 (0.056)	-0.031 (0.070)
Private renter	0.047 (0.032)	0.049 (0.032)	0.049 (0.032)	0.016 (0.035)	0.054 (0.040)
Social housing	-0.071 (0.043)	-0.070 (0.043)	-0.070 (0.043)	-0.068 (0.049)	-0.043 (0.051)
Rent free	-0.067 (0.062)	-0.067 (0.062)	-0.067 (0.062)	-0.077 (0.068)	-0.074 (0.068)
SA4 unemployment rate	-0.001 (0.006)	-0.002 (0.006)	-0.002 (0.006)	-0.001 (0.006)	-0.001 (0.006)
Unemployment duration (weeks)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
[Unemployment duration (weeks)] ²	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Local area house value/100,000	-	-	-0.001 (0.006)	-0.003 (0.006)	-0.001 (0.006)
Arrears in rent/mortgage	-	-	-	0.139*** (0.027)	0.139*** (0.027)
Actual housing cost/100 (monthly)	-	-	-	-	-0.004* (0.002)
Years at residence	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.003* (0.002)	-0.003 (0.002)
Aged 25–34 years	0.086** (0.040)	0.085* (0.040)	0.087* (0.040)	0.087 (0.045)	0.086* (0.045)

	(1)	(2)	(3)	(4)	(5)
Aged 35–44 years	0.125*** (0.038)	0.124*** (0.038)	0.126*** (0.039)	0.136*** (0.042)	0.137*** (0.042)
Aged 45–54 years	0.133*** (0.037)	0.132*** (0.037)	0.134*** (0.037)	0.160*** (0.040)	0.160*** (0.040)
Couples with children	-0.095*** (0.033)	-0.094*** (0.033)	-0.093*** (0.033)	-0.109*** (0.036)	-0.099*** (0.036)
Couples with children under 4	-0.121*** (0.035)	-0.122*** (0.035)	-0.122*** (0.035)	-0.094*** (0.038)	-0.091*** (0.038)
Couple without children	-0.077** (0.032)	-0.077** (0.032)	-0.076** (0.032)	-0.053 (0.035)	-0.045 (0.035)
Lone parents	-0.037 (0.039)	-0.037 (0.039)	-0.034 (0.039)	-0.051 (0.043)	-0.046 (0.043)
Lone parents with children < 4 years	-0.202*** (0.065)	-0.202*** (0.065)	-0.198*** (0.065)	-0.222*** (0.073)	-0.217*** (0.073)
Non dependent child	-0.046 (0.047)	-0.044 (0.047)	-0.045 (0.047)	-0.058 (0.051)	-0.049 (0.052)
Other family member	0.099 (0.063)	0.099 (0.063)	0.100 (0.063)	0.105 (0.067)	0.112 (0.067)
Unrelated to other household members	-0.089 (0.075)	-0.088 (0.075)	-0.089 (0.075)	-0.021 (0.081)	-0.013 (0.082)
Male	0.132*** (0.022)	0.133*** (0.022)	0.133*** (0.022)	0.140*** (0.024)	0.137*** (0.024)
University	-0.103*** (0.032)	-0.103*** (0.032)	-0.101*** (0.032)	-0.104*** (0.034)	-0.098*** (0.034)
Diploma	-0.054 (0.038)	-0.053 (0.038)	-0.053 (0.039)	-0.049 (0.041)	-0.043 (0.041)
Certificate	0.052* (0.026)	0.052* (0.026)	0.052* (0.026)	0.040 (0.028)	0.042 (0.028)
Year 12	0.012 (0.032)	0.012 (0.032)	0.012 (0.032)	0.024 (0.035)	0.026 (0.035)
Imputed financial year income/10,000	0.003 (0.003)	0.003 (0.003)	0.004 (0.003)	0.005* (0.002)	0.006*** (0.002)
Australian born	0.004 (0.030)	0.004 (0.030)	0.005 (0.030)	-0.021 (0.033)	-0.019 (0.033)
Overseas born (Eng. speaking)	0.042 (0.039)	0.043 (0.039)	0.044 (0.039)	0.031 (0.043)	0.032 (0.043)
ATSI	-0.018 (0.048)	-0.018 (0.048)	-0.021 (0.048)	-0.050 (0.056)	-0.052 (0.056)
Balance of NSW	0.045 (0.038)	0.045 (0.038)	0.044 (0.039)	0.052 (0.041)	0.045 (0.041)
Melbourne	0.015 (0.034)	0.015 (0.034)	0.014 (0.034)	-0.011 (0.036)	-0.015 (0.037)

	(1)	(2)	(3)	(4)	(5)
Balance of Victoria	0.076 (0.046)	0.076 (0.046)	0.075 (0.048)	0.086 (0.052)	0.075 (0.052)
Brisbane	0.051 (0.039)	0.051 (0.039)	0.048 (0.041)	0.020 (0.044)	0.016 (0.044)
Balance of Qld	0.037 (0.037)	0.038 (0.037)	0.037 (0.038)	0.026 (0.041)	0.019 (0.041)
Adelaide	0.005 (0.046)	0.005 (0.046)	0.002 (0.048)	-0.012 (0.052)	-0.018 (0.052)
Balance of SA	-0.120 (0.076)	-0.120 (0.076)	-0.124 (0.078)	-0.206** (0.091)	-0.222*** (0.091)
Perth	-0.041 (0.048)	-0.041 (0.048)	-0.039 (0.048)	-0.029 (0.053)	-0.032 (0.053)
Balance of WA	-0.012 (0.097)	-0.012 (0.097)	-0.014 (0.100)	-0.073 (0.105)	-0.077 (0.105)
Tasmania	0.081 (0.054)	0.081 (0.054)	0.078 (0.056)	0.078 (0.060)	0.072 (0.060)
Northern Territory	0.002 (0.119)	0.003 (0.120)	0.001 (0.120)	0.014 (0.134)	0.008 (0.134)
ACT	-0.206*** (0.080)	-0.205*** (0.081)	-0.207*** (0.080)	-0.230*** (0.087)	-0.228*** (0.087)
Constant	1.043*** (0.070)	1.043*** (0.070)	1.050*** (0.082)	1.046*** (0.090)	1.039*** (0.090)
Observations.	3,459	3,459	3,451	2,916	2,916
Pseudo R ²	0.022	0.022	0.022	0.027	0.027

Notes: Standard errors in parentheses. The specifications also include a full set of time dummy variables. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Reservation wage models

The models reported in Chapter 4 use the following specification:

$$\ln W_{it} = \alpha_t + \beta_1 X_{it} + \beta_2 H_{it} + v_{it} \quad (1)$$

Where i indexes individuals and t indexes time: W_{it} is a measure of reservation wages; X_{it} is a vector of covariates that are assumed to influence the level of reservation wages; H_{it} is a vector that captures housing tenure and other associated costs of housing; and v_{it} is an error term which captures all other influences. The models are estimated in Stata 14 using an OLS specification.

Table A9: Reservation wage estimates—regression results

	(1)	(2)	(3)	(4)	(5)
Mortgagor	0.044*** (0.016)	-	-	-	-
LVR <0.5	-	0.063*** (0.018)	0.062*** (0.018)	0.064*** (0.020)	0.005 (0.022)
LVR >=0.5 & <0.8	-	0.021 (0.022)	0.036 (0.022)	0.024 (0.024)	-0.063* (0.028)
LVR >=0.8	-	0.018 (0.027)	0.029 (0.027)	0.043 (0.029)	-0.076* (0.036)
Private renter	-0.019 (0.018)	-0.022 (0.018)	-0.020 (0.017)	-0.023 (0.019)	-0.081*** (0.022)
Social housing	-0.057** (0.023)	-0.060*** (0.023)	-0.059*** (0.022)	-0.044 (0.025)	-0.081*** (0.026)
Rent free	-0.004 (0.031)	-0.006 (0.031)	-0.007 (0.031)	-0.002 (0.034)	-0.006 (0.034)
SA4 unemployment rate	-0.002 (0.003)	-0.002 (0.003)	0.000 (0.003)	-0.003 (0.003)	-0.003 (0.003)
Unemployment duration (weeks)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000** (0.000)
[Unemployment duration (weeks)] ²	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)
Local area house value/100,000	-	-	0.018*** (0.003)	0.014*** (0.003)	0.012*** (0.003)
Arrears in rent/mortgage	-	-	-	-0.028 (0.015)	-0.028 (0.015)
Actual housing cost/100 (monthly)	-	-	-	-	0.006*** (0.001)
Years at residence	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Aged 25–34 years	-0.051** (0.021)	-0.047** (0.021)	-0.050** (0.021)	-0.058** (0.023)	-0.056** (0.023)
Aged 35–44 years	-0.031 (0.020)	-0.030 (0.020)	-0.030 (0.020)	-0.023 (0.021)	-0.025 (0.021)

	(1)	(2)	(3)	(4)	(5)
Aged 45–54 years	-0.010 (0.019)	-0.009 (0.019)	-0.009 (0.019)	-0.002 (0.021)	-0.002 (0.020)
Couples with children	-0.029 (0.018)	-0.031 (0.018)	-0.027 (0.018)	-0.030 (0.019)	-0.043* (0.019)
Couples with children under 4	0.070*** (0.018)	0.072*** (0.018)	0.069*** (0.018)	0.070*** (0.020)	0.065*** (0.020)
Couple without children	-0.012 (0.018)	-0.013 (0.018)	-0.012 (0.018)	-0.015 (0.019)	-0.027 (0.019)
Lone parents	0.016 (0.021)	0.015 (0.021)	0.019 (0.021)	-0.001 (0.024)	-0.007 (0.023)
Lone parents with children < 4 years	0.077** (0.033)	0.077*** (0.033)	0.080*** (0.033)	0.108*** (0.037)	0.100*** (0.037)
Non dependent child	-0.047 (0.026)	-0.050 (0.026)	-0.046 (0.026)	-0.054 (0.029)	-0.068** (0.029)
Other family member	-0.034 (0.036)	-0.035 (0.036)	-0.030 (0.035)	-0.006 (0.040)	-0.015 (0.039)
Unrelated to other household members	-0.117*** (0.038)	-0.117*** (0.038)	-0.118*** (0.038)	-0.131*** (0.042)	-0.143*** (0.042)
Male	0.061*** (0.012)	0.060*** (0.012)	0.065*** (0.012)	0.061*** (0.013)	0.066*** (0.013)
University	0.293*** (0.017)	0.293*** (0.017)	0.269*** (0.017)	0.269*** (0.018)	0.261*** (0.018)
Diploma	0.114*** (0.021)	0.113*** (0.021)	0.101*** (0.021)	0.109*** (0.022)	0.101*** (0.022)
Certificate	0.045*** (0.014)	0.046*** (0.014)	0.045*** (0.014)	0.041*** (0.015)	0.038*** (0.015)
Year 12	0.039* (0.017)	0.039* (0.017)	0.033* (0.017)	0.032 (0.019)	0.029 (0.019)
Imputed financial year income/10,000	0.034*** (0.002)	0.034*** (0.002)	0.033*** (0.002)	0.033*** (0.002)	0.031*** (0.002)
Australian born	0.023 (0.016)	0.023 (0.016)	0.019 (0.016)	0.024 (0.017)	0.022 (0.017)
Overseas born (Eng. speaking)	0.054** (0.022)	0.054** (0.022)	0.044* (0.022)	0.036 (0.024)	0.035 (0.024)
Aboriginal and Torres Strait Islander	-0.007 (0.027)	-0.007 (0.027)	0.001 (0.027)	-0.002 (0.031)	0.001 (0.031)
Balance of NSW	-0.067*** (0.020)	-0.068*** (0.020)	-0.044* (0.021)	-0.039 (0.022)	-0.029 (0.022)
Melbourne	-0.033 (0.018)	-0.034 (0.018)	-0.020 (0.018)	-0.006 (0.020)	-0.000 (0.020)

	(1)	(2)	(3)	(4)	(5)
Balance of Victoria	-0.084*** (0.025)	-0.086*** (0.025)	-0.045 (0.025)	-0.046 (0.028)	-0.029 (0.028)
Brisbane	-0.024 (0.022)	-0.025 (0.022)	0.003 (0.022)	0.020 (0.024)	0.027 (0.024)
Balance of Qld	-0.080*** (0.020)	-0.081*** (0.020)	-0.048** (0.021)	-0.043 (0.022)	-0.032 (0.022)
Adelaide	-0.047 (0.026)	-0.048 (0.026)	-0.004 (0.027)	0.017 (0.029)	0.028 (0.029)
Balance of SA	-0.029 (0.035)	-0.029 (0.035)	0.027 (0.036)	0.038 (0.039)	0.063 (0.039)
Perth	0.012 (0.025)	0.011 (0.025)	0.027 (0.025)	0.031 (0.027)	0.035 (0.027)
Balance of WA	0.009 (0.042)	0.008 (0.042)	0.032 (0.042)	0.026 (0.045)	0.033 (0.044)
Tasmania	-0.054 (0.032)	-0.055 (0.032)	-0.007 (0.033)	-0.009 (0.035)	0.002 (0.035)
Northern Territory	-0.093 (0.064)	-0.093 (0.064)	-0.076 (0.064)	-0.134 (0.068)	-0.124 (0.068)
ACT	0.227*** (0.044)	0.227*** (0.044)	0.244*** (0.044)	0.208*** (0.048)	0.205*** (0.048)
Constant	2.979*** (0.038)	2.9802*** (0.038)	2.855*** (0.043)	2.902*** (0.046)	2.913*** (0.046)
Observations	3,459	3,459	3,451	2,916	2,916
R ²	0.446	0.447	0.454	0.467	0.476

Notes: Standard errors in parentheses. The specifications also include a full set of time dummy variables. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Geographic and job mobility models

The models reported in Chapter 6 use a multinomial probit specification. For the job and geographic mobility changes, four possible outcomes are defined, with 'no geographic mobility and no job changes' the omitted category. For the employment transition models, the omitted category is employment. In each case, standard errors are clustered at the individual level. In each specification, various individual-level characteristics are included in the specification, along with a series of housing-related variables including tenure.

Table A10: Geographic and job mobility—regression results

	Geographic mobility, no job change	No geographic mobility, job change	Geographic mobility and job change
LVR <0.5	-0.056 (0.039)	0.037 (0.038)	-0.029 (0.063)
LVR >=0.5 & <0.8	0.018 (0.047)	0.101* (0.046)	0.131 (0.072)
LVR >=0.8	-0.054 (0.056)	0.146** (0.053)	0.0841 (0.083)
Private renter	1.123*** (0.041)	0.289*** (0.044)	1.028*** (0.060)
Social housing	0.464*** (0.085)	0.006 (0.105)	0.331** (0.125)
Rent free	0.797*** (0.069)	-0.051 (0.084)	0.761*** (0.090)
Imputed financial year income/10,000	0.010*** (0.002)	-0.013** (0.004)	-0.0154** (0.005)
Couples with children	-0.228*** (0.056)	-0.032 (0.061)	-0.231** (0.085)
Couples with children 4 under	0.179*** (0.033)	-0.060 (0.036)	0.035 (0.052)
Couples without children	-0.048 (0.038)	0.054 (0.044)	-0.081 (0.054)
Lone parents	0.064 (0.060)	0.106 (0.066)	-0.067 (0.088)
Lone parents with children 4 under	0.186 (0.111)	0.032 (0.137)	0.232 (0.151)
Non dependant child	0.521*** (0.076)	0.107 (0.085)	0.436*** (0.103)
Other family member	0.039 (0.095)	-0.092 (0.110)	-0.312* (0.154)

	Geographic mobility, no job change	No geographic mobility, job change	Geographic mobility and job change
Unrelated to all HH members	0.132 (0.086)	0.082 (0.099)	-0.002 (0.109)
Australian born	-0.024 (0.034)	0.014 (0.040)	0.119* (0.056)
Overseas born (Eng. speaking)	0.023 (0.044)	0.078 (0.052)	0.265*** (0.071)
Aboriginal and Torres Strait Islander	0.064 (0.088)	0.156 (0.115)	0.319* (0.137)
Aged 25–34 years	0.543*** (0.045)	0.626*** (0.047)	0.944*** (0.074)
Aged 35–44 years	0.275*** (0.043)	0.410*** (0.045)	0.506*** (0.073)
Aged 45–54 years	0.121** (0.042)	0.189*** (0.042)	0.291*** (0.073)
Balance of NSW	0.122** (0.045)	-0.081 (0.051)	0.179** (0.065)
Melbourne	0.058 (0.037)	0.070 (0.042)	0.049 (0.055)
Balance of Victoria	0.079 (0.054)	-0.150* (0.059)	0.156* (0.079)
Brisbane	0.171*** (0.044)	0.041 (0.051)	0.288*** (0.063)
Balance of Qld	0.243*** (0.045)	0.118* (0.051)	0.421*** (0.063)
Adelaide	-0.017 (0.052)	-0.013 (0.060)	0.091 (0.081)
Balance of SA	-0.187* (0.076)	-0.203* (0.085)	0.027 (0.112)
Perth	0.160*** (0.048)	0.137* (0.053)	0.233** (0.075)
Balance of WA	-0.087 (0.079)	-0.073 (0.096)	0.357*** (0.102)
Tasmania	0.010 (0.075)	-0.220** (0.081)	0.042 (0.107)
Northern Territory	0.195* (0.094)	0.173 (0.109)	0.804*** (0.120)

	Geographic mobility, no job change	No geographic mobility, job change	Geographic mobility and job change
ACT	0.239*** (0.073)	0.099 (0.077)	0.087 (0.115)
University	0.085* (0.033)	-0.068 (0.038)	0.146** (0.051)
Diploma	0.125** (0.041)	-0.0109 (0.048)	0.136* (0.062)
Certificate	0.088** (0.034)	0.032 (0.038)	0.099 (0.052)
Year 12	0.038 (0.040)	-0.043 (0.044)	-0.005 (0.060)
Number of bedrooms	-0.0532*** (0.013)	-0.0258 (0.015)	-0.044* (0.019)
Years at residence	-0.027*** (0.002)	-0.015*** (0.002)	-0.036*** (0.004)
Number of persons in the household	0.004 (0.015)	0.004 (0.016)	-0.010 (0.023)
Male	0.020 (0.023)	0.058* (0.027)	0.032 (0.035)
Health condition	0.007 (0.029)	0.090** (0.030)	0.042 (0.042)
Local area house value/100,000	0.009 (0.005)	-0.002 (0.006)	0.020** (0.007)
SA4 unemployment rate	0.008 (0.006)	-0.011 (0.006)	0.009 (0.008)
Arrears in rent/ mortgage	0.0155 (0.044)	0.480*** (0.041)	0.436*** (0.052)
Actual housing cost/100 (monthly)	-0.001 (0.001)	-0.002 (0.001)	-0.007** (0.002)
Commute time per week	0.009*** (0.003)	0.017*** (0.003)	0.007 (0.004)
Constant	-2.266*** (0.099)	-2.039*** (0.107)	-3.330*** (0.156)
Observations	64,896	64,896	64,896

*Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Table A11: Labour market transitions from unemployment—regression results

	Unemployed	NLF	Underemployed
LVR <0.5	-0.069 (0.179)	0.011 (0.163)	-0.036 (0.172)
LVR >=0.5 & <0.8	-0.154 (0.250)	-0.033 (0.210)	-0.235 (0.226)
LVR >=0.8	-0.177 (0.307)	0.252 (0.267)	-0.153 (0.296)
Private renter	0.305 (0.180)	0.197 (0.162)	0.108 (0.171)
Social housing	0.268 (0.203)	0.321 (0.192)	-0.056 (0.215)
Rent free	0.138 (0.246)	0.071 (0.233)	-0.198 (0.262)
Couples with children	-0.330 (0.212)	-0.310 (0.208)	-0.126 (0.222)
Couples with children < 4 years	-0.051 (0.167)	0.170 (0.154)	-0.003 (0.174)
Couples without children	-0.367* (0.159)	-0.240 (0.154)	-0.139 (0.166)
Lone parents	-0.230 (0.208)	-0.231 (0.197)	0.082 (0.213)
Lone parents with children < 4 years	-0.104 (0.314)	0.258 (0.287)	-0.212 (0.320)
Non-dependent child	0.233 (0.228)	0.231 (0.233)	0.338 (0.260)
Other family member	-0.087 (0.316)	-0.128 (0.301)	0.035 (0.307)
Unrelated	-0.406 (0.288)	-0.369 (0.290)	-0.315 (0.336)
Australian born	-0.431** (0.134)	-0.293* (0.130)	-0.0754 (0.141)
Overseas born (Eng. speaking)	-0.231 (0.186)	-0.258 (0.177)	-0.119 (0.194)
Aboriginal and Torres Strait Islander	0.451 (0.251)	0.221 (0.231)	0.290 (0.273)
Aged 25–34 years	-0.554** (0.181)	-1.123*** (0.164)	-0.710*** (0.185)

	Unemployed	NLF	Underemployed
Aged 35–44 years	-0.346* (0.169)	-0.974*** (0.154)	-0.557** (0.174)
Aged 45–54 years	-0.275 (0.164)	-0.717*** (0.152)	-0.285 (0.167)
Balance of NSW	0.151 (0.175)	0.123 (0.176)	0.222 (0.188)
Melbourne	-0.123 (0.159)	-0.053 (0.157)	0.003 (0.165)
Balance of Victoria	-0.103 (0.223)	-0.069 (0.205)	-0.004 (0.219)
Brisbane	-0.231 (0.191)	-0.191 (0.177)	-0.254 (0.198)
Balance of Qld	-0.302 (0.164)	-0.009 (0.168)	-0.218 (0.181)
Adelaide	-0.207 (0.221)	0.153 (0.219)	0.308 (0.221)
Balance of SA	-0.037 (0.303)	0.328 (0.279)	0.259 (0.325)
Perth	-0.364 (0.215)	-0.211 (0.220)	-0.187 (0.224)
Balance of WA	-0.249 (0.376)	-0.240 (0.341)	-0.409 (0.385)
Tasmania	0.420 (0.330)	0.451 (0.255)	0.157 (0.328)
Northern Territory	-0.281 (0.408)	-0.468 (0.505)	0.350 (0.455)
ACT	-0.450 (0.501)	-0.742 (0.516)	-0.215 (0.408)
University	-0.393** (0.144)	-0.479*** (0.143)	-0.003 (0.149)
Diploma	-0.535** (0.168)	-0.518** (0.163)	-0.069 (0.172)
Certificate	-0.175 (0.122)	-0.302** (0.114)	0.125 (0.124)
Year 12	-0.043 (0.156)	0.120 (0.141)	0.106 (0.169)
Number of bedrooms	-0.159** (0.052)	-0.080 (0.053)	-0.057 (0.057)

	Unemployed	NLF	Underemployed
Years at address	0.017* (0.007)	0.013 (0.007)	-0.005 (0.008)
Number of persons	0.077 (0.051)	0.135** (0.048)	0.069 (0.055)
Male	-0.170 (0.103)	-0.544*** (0.098)	-0.437*** (0.105)
Health condition	0.341*** (0.102)	0.482*** (0.0960)	-0.024 (0.110)
Imputed financial year market income/ 10,000	-0.093** (0.028)	-0.114*** (0.025)	-0.071*** (0.021)
Local area house value SA3/100,000	-0.053* (0.026)	-0.037 (0.024)	-0.008 (0.025)
SA4 unemployment rate	0.003 (0.024)	-0.039 (0.025)	-0.044 (0.027)
Arrears in rent/ mortgage	0.280* (0.112)	0.074 (0.116)	0.043 (0.131)
Actual housing cost/100 (monthly)	-0.014 (0.010)	-0.011 (0.008)	-0.006 (0.007)
Individual move address	-0.228* (0.109)	-0.126 (0.107)	-0.109 (0.118)
Constant	1.828*** (0.402)	1.821*** (0.372)	0.675 (0.403)
Observations	2,558	2,558	2,558

*Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively.*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

Table A12: Labour market transitions from underemployment—regression results

	Unemployed	NLF	Underemployed
LVR <0.5	-0.220 (0.159)	-0.029 (0.113)	-0.115 (0.090)
LVR >=0.5 & <0.8	-0.137 (0.211)	-0.033 (0.148)	-0.338** (0.119)
LVR >=0.8	-0.122 (0.252)	-0.122 (0.187)	-0.355* (0.153)
Private renter	-0.101 (0.168)	-0.085 (0.123)	-0.154 (0.103)
Social housing	0.210 (0.212)	0.178 (0.175)	-0.068 (0.162)
Rent free	-0.180 (0.299)	0.301 (0.206)	-0.164 (0.179)
Couples with children	-0.476* (0.225)	-0.213 (0.168)	-0.025 (0.141)
Couples with children < 4 years	0.098 (0.147)	0.174 (0.104)	-0.065 (0.086)
Couples without children	-0.128 (0.158)	-0.002 (0.123)	-0.087 (0.109)
Lone parents	0.105 (0.197)	0.060 (0.158)	0.245 (0.132)
Lone parents with children < 4 years	-0.393 (0.320)	0.057 (0.251)	-0.179 (0.203)
Non-dependent child	0.444 (0.234)	0.182 (0.208)	0.195 (0.195)
Other family member	0.165 (0.349)	-0.104 (0.285)	0.159 (0.238)
Unrelated to others in household	-0.026 (0.347)	-0.086 (0.317)	0.136 (0.241)
Australian born	-0.067 (0.136)	-0.228* (0.099)	-0.275*** (0.083)
Overseas born (Eng. speaking)	-0.116 (0.191)	-0.296* (0.142)	-0.408*** (0.123)
Aboriginal and Torres Strait Islander	-0.011 (0.264)	-0.399 (0.249)	-0.238 (0.191)
Aged 25–34 years	-0.178 (0.158)	-0.467*** (0.123)	-0.037 (0.116)

	Unemployed	NLF	Underemployed
Aged 35–44 years	-0.110 (0.148)	-0.604*** (0.116)	-0.008 (0.106)
Aged 45–54 years	-0.119 (0.142)	-0.451*** (0.106)	0.149 (0.098)
Balance of NSW	-0.293 (0.190)	0.197 (0.134)	-0.0305 (0.111)
Melbourne	0.105 (0.161)	0.120 (0.124)	0.000 (0.108)
Balance of Victoria	-0.213 (0.221)	0.052 (0.153)	0.121 (0.134)
Brisbane	-0.359 (0.206)	-0.229 (0.153)	-0.042 (0.119)
Balance of Qld	-0.105 (0.181)	0.132 (0.139)	0.079 (0.113)
Adelaide	-0.240 (0.227)	-0.014 (0.175)	-0.052 (0.139)
Balance of SA	-0.083 (0.263)	-0.038 (0.218)	0.074 (0.179)
Perth	-0.034 (0.232)	0.052 (0.174)	-0.001 (0.143)
Balance of WA	0.009 (0.316)	0.409 (0.215)	0.536* (0.243)
Tasmania	-0.500 (0.291)	-0.057 (0.212)	-0.066 (0.161)
Northern Territory	0.276 (0.519)	-0.232 (0.397)	0.011 (0.429)
ACT	0.289 (0.360)	0.249 (0.304)	0.001 (0.277)
University	-0.322* (0.126)	-0.138 (0.099)	-0.197* (0.086)
Diploma	-0.340* (0.171)	-0.159 (0.120)	-0.217 (0.112)
Certificate	-0.283* (0.112)	-0.183 (0.094)	-0.094 (0.078)
Year 12	-0.242 (0.137)	-0.111 (0.112)	-0.097 (0.094)
Number of bedrooms	-0.044 (0.052)	-0.046 (0.040)	-0.046 (0.034)

	Unemployed	NLF	Underemployed
Years at address	-0.021** (0.007)	-0.002 (0.005)	0.006 (0.004)
Number of persons	0.053 (0.056)	0.065 (0.043)	-0.003 (0.033)
Male	0.184 (0.094)	-0.232** (0.080)	-0.109 (0.070)
Health condition	0.197* (0.097)	0.472*** (0.073)	0.074 (0.065)
Imputed financial year market income/ 10,000	-0.115*** (0.026)	-0.127*** (0.022)	-0.070*** (0.014)
Local area house value SA3/100,000	-0.039 (0.022)	0.012 (0.014)	-0.023 (0.012)
SA4 unemployment rate	0.012 (0.021)	0.001 (0.018)	0.0015 (0.015)
Arrears in rent/ mortgage	0.552*** (0.119)	0.237* (0.100)	0.135 (0.045)
Housing costs/100	-0.015 (0.009)	-0.005 (0.005)	-0.002 (0.004)
Individual move	0.329** (0.107)	0.308*** (0.089)	-0.127 (0.072)
Constant	-0.474 (0.399)	-0.341 (0.301)	0.954*** (0.255)
Observations	5,773	5,773	5,773

*Note: Standard errors in parentheses. Statistical significance at the 5, 2.5 and 1 per cent levels are indicated by *, ** and *** respectively*

Source: Estimates are based on authors' own calculations using waves 1 to 14 of HILDA.

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