



## A new look at the channels from housing to employment decisions

Inquiry into housing policies, labour force participation and economic growth

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## Acronyms and abbreviations used in this report

AHURI	Australian Housing and Urban Research Institute Limited
CRA	Commonwealth Rent Assistance
EMTR	Effective marginal tax rate
HA	Housing assistance
HILDA	Household, Income and Labour Dynamics of Australia
NILF	Not in the labour force
OECD	Organisation for Economic Co-operation and Development
RR	Replacement rate
SA	Social assistance

# Executive summary

## Key points

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The purpose of this study is to investigate the role of current housing assistance arrangements, housing wealth and mortgages in individuals' employment decisions. The study also explores whether bequests or parental cash transfers, which are typically financed (directly or indirectly) through housing wealth, lower work effort and participation in skills and training programs.

Key findings from the study indicate that:

- Housing assistance to private rental and public housing tenants has little effect on employment. For example, our modelling estimates suggest that even if Commonwealth Rent Assistance were to be removed the probability of continued employment would increase by only 0.3 percentage points, from 91.1 per cent to 91.4 per cent.
- Higher levels of housing wealth seem to help older 'inactive' owners (i.e. not in the labour force) regain employment, and help precariously employed younger home owners secure their employment.
- Rising levels of mortgage indebtedness appear to be extending working lives—these findings are consistent with AHURI research reported in Atalay, Barrett et al. (2016).
- For persons aged 45–54 (55–64) in 2001, mortgagors' odds of leaving the labour force is only 19 per cent (27%) of outright owners' odds of leaving the labour force (all else being equal).
- Longer working lives will help mitigate declining rates of employment and productivity slowdown due to population ageing. However, it comes at the expense of a higher investment and repayment risk burden in later life.
- Beneficiaries of parental cash transfers or bequests have better educational qualifications, and in particular are more likely to hold a bachelor's degree, than a control group of non-beneficiaries.
- Beneficiaries also have average bank deposit account balances that are more than double those of non-beneficiaries, and average net investment income is roughly one-third higher.
- The proportion of beneficiaries in the labour force is roughly the same as for non-beneficiaries, but a significantly higher proportion is self-employed.

Findings from the project will broaden the current evidence base to inform a policy reform agenda that features increasing employment participation rates in order to counter the labour market consequences of population ageing.

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## Key findings

### ***Do different government transfer programs, and especially housing assistance, blunt the incentive to work and depress employment participation rates?***

There are two main housing assistance programs: Commonwealth Rent Assistance (CRA) and public housing. Our modelling suggests that CRA has a negligible influence on the future employment outcomes of those already employed. Its removal is estimated to increase the probability of continued employment by only 0.3 percentage points, from 91.1 per cent to 91.4 per cent. Hence, CRA is only a marginal influence on the incentive to work. Even among unemployed adults receiving income support payments such as Newstart or Youth allowance, CRA has little influence on the chances of a successful transition back into employment. An important reason is a judicious CRA design feature that restricts eligibility to those in receipt of an income support payment, but only withdraws CRA once eligibility to the underlying income support payment is lost. Thus, Newstart (or Youth) allowance and CRA are never simultaneously withdrawn. Our modelling results suggest that blunt work incentives are not the main cause of this group of housing assistance recipients' low rates of employment participation.

Public housing tenants are a severely disadvantaged group who face multiple barriers to employment. Hence, reforms that reduce the burden of taxation on additional earnings, or lower taper rates in income support programmes will have only small effects on employment rates. An integrated approach that addresses barriers to employment for those in public housing (e.g. drug and alcohol abuse, mental health problems, skills deficiencies and so on) is likely to be a more effective approach to improving the employment outcomes of public housing tenants.

### ***Home buyers are taking on larger mortgages (relative to household incomes) and repaying outstanding mortgage debt later in life. Is this going to delay age related declines in rates of employment?***

Our empirical analysis as well as earlier AHURI research reported in Atalay, Barrett et al. (2016), confirms a finding that higher mortgage indebtedness is linked with stronger labour market ties. For instance, we find that for mortgage holders aged 45–54 (55–64) in 2001, the odds of leaving the labour force is only 19 per cent (27% of outright owners' odds of leaving the labour force (all else being equal). Growing indebtedness among Australian home owners approaching retirement appears to be associated with longer working lives. These higher levels of mortgage debt may be in part the product of higher real house prices that prompt home buyers to take on high levels of debt in order to finance their preferred housing choices. An alternative explanation is that Australians now expect to live longer lives, plan to work beyond pensionable age and are therefore comfortable with decisions to pay off mortgages later in life. Whatever the explanation, the result is the same: longer working lives and a more gradual decline in rates of labour force participation as Australians age. This will help the Australian economy mitigate declining rates of employment and productivity slowdown due to population ageing.

There have been fears that growing indebtedness among Australians in midlife reflects a deliberate plan to 'de facto' access superannuation balances before reaching preservation age (when access to superannuation balances becomes possible if you have retired). This would of course undermine an important goal of retirement incomes policy—that is, alleviating pressure on government age pensions. However, the evidence that we present here suggests that those carrying mortgage debt as they approach retirement age have much stronger employment ties and are working later in life than their outright-owner counterparts. These longer working lives imply accumulation of larger superannuation balances, as well as a later drawdown of those balances.

***Housing remains the most important component of most households' wealth portfolio. Intergenerational transfers are an important feature of contemporary family life and housing wealth will be an important direct or indirect funding source for these transfers. Are these transfers helping to shape the education and employment outcomes of beneficiaries?***

To estimate the effects of intergenerational transfers on education and employment outcomes we use a research method that mimics clinical trials. Every person that has received an inheritance or cash transfer from their parents is matched to a control person who has not been a beneficiary, but is judged to be similarly likely to have received one given their personal characteristics.

There are three key findings;

- 1** Beneficiaries have better educational qualifications, and in particular are more likely to hold a bachelor's degree.
- 2** Beneficiaries' average bank deposit account balances are more than double those of our control group, and average net investment income is roughly one-third higher.
- 3** The proportion of beneficiaries in the labour force is roughly the same as for non-beneficiaries, but a significantly higher proportion are self-employed.

The recipients of transfers therefore have more financial assets that can act as a buffer to meet income shocks, and collateral to relax borrowing constraints. In view of these differences, beneficiaries might take more risks, and are in a better position to borrow, whether to take advantage of educational opportunities or to finance business start-ups. The evidence confirms expectations about education and business start-ups, but whether this is because beneficiaries are less risk averse or better able to relax borrowing constraints awaits further research. It would therefore seem that the intergenerational circulation of housing wealth helps recipients achieve their educational goals, as well as establish business ventures that might not otherwise 'get off the ground'.

Offsetting the above positives are negative implications for equality (see also Barrett, Cigdem et al. 2015b). The evidence shows that children from affluent socio-economic backgrounds are more likely to receive intergenerational transfers than those from a disadvantaged background. Intergenerational wealth transfers may help entrench and even exacerbate inequality in lifetime economic opportunities. If intergenerational transfers become increasingly important as a pillar supporting educational, housing and business start-up opportunities, policy-makers will need to heed the consequences for those children of less well-off parents who are bypassed by the intergenerational circulation of housing wealth.

## **Policy development options**

There are a number of recent policy initiatives that aim to increase employment participation, and these typically fall into three types. The first focuses on delaying eligibility for non-work sources of retirement income, including the age pension and superannuation pay-outs. The second aims to incentivise workforce participation by lowering the tax on income earned through tax offsets. The third is a general tightening of eligibility criteria governing access to income support payments. Reforms to housing assistance programs have played a negligible role in policy-making around the issue of work incentives. The findings presented in this project are largely supportive of this neglect.

However, none of the above initiatives address the fact that a majority of older Australians have typically accumulated large reserves of housing wealth, encouraged by tax and means-test concessions that offer preferential treatment of the family home. They can increasingly draw

down on this housing wealth without undergoing a costly application process, as a result of financial innovations that have turned housing wealth into an 'ATM' that borrowers can draw from as and when they choose (Ong, Jefferson et al. 2013; Smith and Searle 2010). This growing fungibility of housing wealth, combined with growing reserves of housing wealth, appears to play a role in influencing workers' decisions to either continue in or withdraw from the labour force as pensionable age approaches.

Our findings also suggest that some Australian home owners are dipping into their housing wealth in order to finance business initiatives. While these findings are subject to caveats, they are of potential importance as they could (if found to be robust) have significant economic spin-offs. Governments might wish to encourage this use of housing wealth by alerting home owners to the tax advantages of using their homes to launch business start-ups. Planning regulations that discourage the use of homes for business purposes might also deserve attention.

The housing wealth of older Australians is likely to affect the education and work career paths of their adult children. This is because parents may dip into (or bequeath) their housing wealth in order to assist children. Those anticipating transfers from their parents may factor this expectation into their education and employment decisions. We know little about how this intergenerational circulation of housing wealth is impacting young adults' working careers and education outcomes. The evidence presented in this report confirms expectations that intergenerational transfers help beneficiaries to 'get ahead', by being better able to complete a university education, while also more prepared to start business and self-employment ventures. Policy-makers might welcome these links and consider options that encourage parents to circulate their housing wealth between the generations. Encouraging financial institutions to launch small-business loans that parents can secure using their homes is one such option. While perhaps attractive as an option for the wealthy, it would be remiss to ignore those bypassed by the circulation of housing wealth between the generations. As intergenerational transfers become more important, they could become an increasingly significant cause of inequality of opportunity, and so this growing wealth divide will warrant attention from policy-makers.

Yet another housing-related development with potentially important implications for labour markets, and hence productivity, is that growing numbers of Australian households are taking on higher levels of mortgage debt (relative to household incomes) and paying down their mortgages later in life (Wood, Ong and Cigdem 2014). Our findings suggest that home owners are prepared to work longer in order to pay down their mortgages. While this appears to be good news as far as retirement incomes policy and employment participation rates is concerned, carrying debt later in life exposes older Australians to risks that seniors in earlier, largely debt-free, generations have not been accustomed to facing. An important hazard is ill health and disability, and it is one that is more likely to occur as we get older. A premature exit from the work force that is precipitated by unexpected bouts of ill health or disability can be disastrous for mortgagors at any stage in the life cycle, but especially so in later life. Governments might therefore consider options that could assist older mortgagors to hedge these risks. A requirement that mortgagors take out mortgage insurance once an age threshold is reached would be one such option; it anticipates an issue that will become more important as the Australian population ages.

## **The study**

This study is one of five supporting projects that will inform a broader inquiry into the key channels through which housing policies might impact upon the economy. The focus of this study is to examine the implications of current housing assistance arrangements, housing wealth and mortgages on individuals' employment decisions. It seeks to broaden the current

evidence base to inform a policy reform agenda that features raising employment participation rates in order to counter the labour market consequences of population ageing.

The key aims of the project can be summarised in the following four research questions.

- 1 Do different government transfer programs, and especially housing assistance, blunt the incentive to work? How do any such effects vary by age cohort, wage range, geographical location and individual/demographic characteristics?
- 2 What are the impacts, in terms of direction and magnitude, of Australia's tax and benefit system—particularly housing assistance—on employment participation decisions?
- 3 What role does housing wealth and mortgage debt play in shaping employment participation decisions at different stages of individuals' employment life cycles?
- 4 Do intergenerational transfers such as bequests lower work effort and participation in skills and training programs?

To undertake the above research inquiry, we rely on the Household, Income and Labour Dynamics in Australia (HILDA) Survey, focusing particularly on years 2001–10. HILDA has become a staple Australian longitudinal data source owing to its abundant reserve of household- and individual-level information covering a wide array of themes. Of key relevance to this research is information relating to individuals' labour market outcomes, demographic profiles, as well as their housing and superannuation wealth.

We employ a variety of quantitative techniques to tackle the main research questions. Random effects logit models and multinomial logit modelling techniques offer estimates of the extent to which interactions between tax provisions and income support programs discourage continued engagement in employment, or the engagement in employment of previously unwaged individuals, taking into account individuals' demographic and socio-economic characteristics, the geographical location in which they reside (Major Statistical Region), wealth and, importantly, their replacement rate (RR) variable, to capture effects on their incentive to work. The work incentive measures incorporate housing allowance parameters, thereby permitting simulations that provide estimates of the direct impact of housing allowances on employment participation. Information on housing equity, mortgage debt and superannuation wealth offer a measure of their respective roles in shaping individuals' labour supply decisions.

'Nest egg' and indebtedness effects are likely to be especially important in the later stages of labour market careers. Logit and multinomial model specifications are therefore modified to include interactions between age and wealth, as well as debt variables. However, we choose to explore their importance in more depth, by selecting a sample of employed persons over the age of 45 and estimating hazard models of the duration of their continued participation in the labour force. We are especially interested in comparing the employment trajectories of mortgagors and outright owners—there being an expectation that the former group's employment ties are stronger.

Finally, we investigate ideas around the links between intergenerational transfers, employment and training using a propensity score matching approach.<sup>1</sup> We empirically examine these possible links by designing a control group whose labour market behaviour can be contrasted with a 'treatment group' who have received a bequest or cash gift over the study time frame (2001–10).

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<sup>1</sup> See Barrett, Cigdem et al. (2015b), where this technique is explained and applied.



# 1 Introduction

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This report examines various possible links between housing related variables and employment. For example, housing assistance can blunt incentive to work and depress employment rates—a hypothesis that has attracted considerable attention in various government reports (see McClure 2015 and Productivity Commission 2015). However, there are also less well-known relationships.

- Soaring real house prices have inflated housing wealth levels, especially for older Australians, and could be encouraging early retirement.
- On the other hand, young and middle-aged Australians have had to borrow more in order to buy housing and are dipping into their housing wealth in order to buffer income shocks. Growing indebtedness in these age groups could be associated with longer working lives in the future.
- Housing assets remain the most important component of most households' wealth portfolio. Intergenerational transfers will be commonly sourced from housing wealth (directly or indirectly) and may help shape the future education and work careers of generations X and Y.

Each of these relationships between housing and employment are emerging as a result of structural change in Australian housing markets. They could have significant impacts on productivity, especially in a country with an ageing population, and debt and housing equity that is unevenly spread across the generations.

This report draws on a panel dataset (the HILDA Survey) to investigate the hypothesised relationships. We deploy descriptive statistical measures, as well as a range of multivariate modelling techniques, in order to generate robust empirical evidence that can help inform relevant policy reforms.

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## 1.1 Aims of the research

The purpose of this study is to conduct an empirical investigation into the implications of current housing assistance arrangements, housing wealth and mortgages on individuals' employment decisions, taking into account the role of a full array of income support programs in Australia. It seeks to broaden the current evidence base, to inform a policy reform agenda that features increasing employment participation rates in order to counter the labour market consequences of population ageing. The project is centred around housing and labour supply, addressing the effects of housing assistance programs on the incentive to work, but also taking into consideration the fungibility of assets following mortgage innovation and deregulation. In Australia, flexible mortgages are used by a growing proportion of older Australian home owners who are approaching retirement with mortgage debt (Ong, Jefferson et al. 2013). These trends may oblige older mortgagors to remain in the workforce for longer and continue to work beyond pension age. At the same time, we have seen a sizeable increase in the incidence of parental transfers and bequests (Barrett, Cigdem et al. 2015a). While a financial boost of this form can be an invaluable aid in facilitating younger cohorts' entry into home ownership, and may also

help older home owners to pay down outstanding mortgages (see Barrett, Cigdem et al. 2015a; 2015b), it could also weaken their labour market attachment, as beneficiaries can maintain the same income levels at a lower level of employment participation. Weaker labour market ties may take the form of reduced labour supply, and/or more modest efforts to improve skills or acquire new ones through professional development and training. Intergenerational transfers might also support a greater tolerance for risk, in which case recipients could be more willing to change jobs/occupations or relocate in order to improve career prospects or start a business venture. There is already some evidence to suggest that the anticipation or receipt of a bequest weakens the propensity to save (Engelhardt and Mayer 1998) and boosts consumption (Joulfaian and Wilhelm 1994). We investigate whether similar behavioural responses are also evident in the labour market.

The key aims of the project can be summarised in the following four research questions.

- 1 Do different government transfer programs, and especially housing assistance, blunt the incentive to work? How do any such effects vary by age cohort, wage range, geographical location and individual/demographic characteristics?
- 2 What are the impacts, in terms of direction and magnitude, of Australia's tax and benefit system—particularly housing assistance—on employment participation decisions?
- 3 What role does housing wealth and mortgage debt play in shaping employment participation decisions at different stages of individuals' employment life cycles?
- 4 Do intergenerational transfers such as bequests lower work effort and participation in skills and training programs?

To undertake the above research inquiry, we rely on the HILDA Survey, focusing particularly on years 2001–10. HILDA has become a staple Australian longitudinal data source owing to its abundant reserve of household- and individual-level information covering a wide array of themes. Of key relevance to this research is information relating to individuals' labour market outcomes, demographic profiles, as well as their housing and superannuation wealth.

Another critical component of this research project is measurement of the incentive to work. Three work incentive measures are commonly used in the empirical literature: (1) the effective marginal tax rate (EMTR), which measures the amount of earned income that would be foregone due to higher tax liabilities and withdrawal of means-tested benefits resulting from increase in private income<sup>2</sup>; (2) the participation tax rate, which is a variant of EMTR but computed with respect to the amount of income 'taxed away' as a result of transition into employment<sup>3</sup>; and (3) the replacement rate (RR), which calculates the income of an individual when in work to their income when not working (either because they are unemployed, or not in the labour force). The first measure captures individuals' behavioural responses at the 'intensive margin' of labour supply—that is, the margin at which an individual decides to reduce or increase their work hours. The second and third measures capture individuals' behaviour at the 'extensive margin'—where individuals decide whether or not to participate at all in the employed labour force. The modern empirical literature indicates that the magnitude of labour supply responsiveness is larger at the extensive margins than at the intensive margins (Eissa and Liebman 1996; Meyer and Rosenbaum 2001; Blundell 2001). This project therefore concentrates on work incentive measures describing the extensive margins of labour supply. That is, we examine employment participation decisions—does an employed person continue in

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<sup>2</sup> It is typical to calculate EMTR using a \$1 per week increase in income. For an Australian study along these lines see Beer (2003).

<sup>3</sup> See Dockery, Ong et al. (2011) for an Australian study that reports participation tax rates.

employment, or does an unwaged person make a transition into employment—and we use the RR as our work incentive measure.

## 1.2 Policy context

Housing and housing assistance programs play a potentially important role in driving employment participation decisions, yet they rarely feature in labour market policy debates, and we lack an evidence base upon which to base reform initiatives. Australia has two main housing assistance programs.<sup>4</sup> Tenants of private rental housing can, if they are eligible for an income support program (including Family Tax Benefit), receive Commonwealth Rent Assistance (CRA). This is a cash supplement to income support and rebates 50 cents in each dollar of rent paid above a rent threshold (caps also apply). Australia has a small public housing sector (by international standards), where tenants typically pay rents that are set at 25 per cent of assessable income. The rents set by public housing authorities are often referred to as ‘concessional rents’ or ‘rebated rents’. Reviews such as the Senate Select Committee on Housing Affordability (2008), Australia’s Future Tax System Review (the ‘Henry Review’) (2009), the ‘McClure’ Review of Australia’s Welfare System (2015) and the Productivity Commission’s 2015 report into housing assistance and employment, have consistently raised concerns about the apparent disincentives to workforce participation created by rent rebates in public housing. Subsequently, housing assistance arrangements have been the subject of several government reviews. Despite this recent scrutiny, no substantive policy reforms have emerged.<sup>5</sup>

There are at least four ways in which employment participation can be impacted by housing circumstances. Firstly, housing assistance programs such as CRA and rent rebates in public housing blunt the incentive to work by raising the proportion of earnings that are replaced when not working (the replacement ratio). They also affect labour supply ‘at the intensive margin’, because the withdrawal of income support and higher taxes accompanying incremental increases in earnings can discourage overtime and other opportunities to increase earnings by working harder. These are the links that attract most attention, and where we have some evidence (Whelan 2004; Dockery, Feeny et al. 2008; Dockery, Ong et al. 2011). Our project extends this program of research by using micro-simulation and econometric modeling techniques to compare the effect that housing assistance programs have on incentive to work and employment participation.

Secondly, the housing assistance and tax concessions that have been made available to owners and investors since the mid-1990s have helped increase real housing prices. With the exception of the First Home Owner Grant, Federal Government does not extend *cash assistance* to help home owners with their housing costs. Instead, federal (and state) governments make indirect assistance available to home owners in the form of various tax concessions: exemption from capital gains and land tax are two examples. These indirect forms of housing assistance are believed to be partly or even mostly capitalised, thus fuelling rising real house prices over the past two decades and leaving many baby boomers with a large ‘nest egg’ of accumulated housing wealth. Many home owners who have been able to ‘ride’ the house price boom have accumulated large windfall gains that can be used to buffer lower incomes following early retirement (Ong, Wood et al. 2015). Whether early disengagement from the workforce has actually been encouraged by this ‘nest egg’ effect is uncertain, but

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<sup>4</sup> The tax concessions to Australian home owners are not typically thought of as a source of housing assistance. However, they lower effective cost of owner-occupied housing. We look at the longer run indirect effects on employment participation in Chapter 3.

<sup>5</sup> Some state housing authorities have introduced ‘rent holidays’ and other inducements to encourage employment, but they have been piecemeal.

speculation about its presence has grown in recent years. We report estimates of the impact of housing wealth on employment participation in the later stages of labour market careers in Chapter 3.

Thirdly, some among the baby boomer generation of owners raided their 'nest eggs' to bring forward consumption and meet pressing spending needs (Parkinson, Searle et al. 2009). They were helped by financial deregulation and mortgage innovation that allows mortgagors to cash in housing equity by adding to existing mortgages (Lowe 2011). Housing wealth is now more fungible than ever before; so instead of conserving or even accumulating housing equity, growing numbers of baby boomers are approaching retirement with large outstanding mortgage debts. The labour market consequences of this growing indebtedness are different from 'nest egg' effects. Heavily indebted baby boomers may be banking on extending work careers well beyond pension age. This effect may be even more pronounced among generations X and Y, who have to take on high levels of debt relative to their incomes in order to make first transitions into home ownership—an indebtedness that is also aggravated by higher education loans. Those generations must also compete in labour markets that are widely believed to offer less secure employment (Parkinson 2010) and hence more volatile earnings, increasing reliance on debt to smooth consumption. Until recently (Atalay, Barrett et al. 2016) these links between indebtedness and labour supply had not been tested empirically.

Fourthly, large bequests and even monetary gifts are yet another consequence of booming real house prices. We estimate that 1,839,619 persons in the Australian population received an inheritance/bequest at least once between 2002 and 2012; the average size was \$82,942 (at current prices), or 1.3 times average annual gross earnings in 2012.<sup>6</sup> The economics literature has explored how the expectation and receipt of bequests weakens savings motives (Engelhardt and Mayer 1998) and boosts consumption (Joulfaian and Wilhelm 1994). After all, why bother curbing the urge to spend in order to (say) save a deposit for home purchase, if gifts or bequests from parents will cover the deposit required in order to purchase a home? There is, of course, an additional possible effect on work effort. Why strive to meet employment goals such as promotion by (say) working harder or acquiring additional qualifications/training, if the higher incomes resulting from more study/work effort are unnecessary in order to meet discretionary spending plans? There is an alternative perspective on the behavioural consequences of an (anticipated) inheritance. Namely, that it can provide a buffer that can encourage the sort of risk-taking that accompanies business start-ups—the recent growth in self-employment and home-based work in Australia and overseas has been interpreted as a manifestation of structural change in labour markets (Gibb, Stephens et al. 2016). Here we explore how house price fuelled bequests and transfers could be playing a role alongside these labour market factors. A propensity score matching methodology is used to explore these possible employment, self-employment and training impacts, and this is reported in Chapter 4.

### 1.3 Existing research

In this project we focus on participation in the labour force and the incentive to work, and their connection with housing assistance, housing wealth and intergenerational transfers of wealth. Housing can of course have wider non-financial impacts. For example, housing tenure can differentially impact residential and labour mobility with adverse consequences for the efficient operation of housing and labour markets. Furthermore, housing and location are jointly consumed and so transport, commuting and neighbourhood stigma effects can also be an

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<sup>6</sup> Figures are based on authors' own calculations using data contained within HILDA Survey Release 12.

important influence on employment participation. These links are potentially important but beyond the scope of this report.<sup>7</sup>

Our literature review is therefore confined to an empirical literature that is centred on the financial dimensions of the incentive to work. While the role of income support programs on welfare recipients' employment decisions has been subject to rigorous empirical investigation in Western Europe, the United States and (to a more modest extent) Australia, far less is known about the role of housing wealth and intergenerational transfer (bequests/parental gifts) on incentive to work and labour supply. The research that has been published is examined in the following three subsections.

### **1.3.1 Housing assistance and the incentive to work**

Notwithstanding cross-national differences in tax and benefit systems, institutional arrangements and empirical strategies, the general consensus in the literature is that generous income support programs typically have adverse effects on individuals' decisions to remain in (or seek) paid work. Housing assistance is an important part of most western developed countries welfare states, and so it is likely to have an important influence on the financial rewards to be gained from employment.

Table 1 illustrates this point by presenting estimates by the Organisation for Economic Cooperation and Development (OECD) of replacement rate (RR) measures that include then exclude social assistance (SA) and housing assistance (HA) programs. The calculation has been made for 33 OECD countries (including Australia) in 2013. It can be seen that the inclusion of social and housing assistance significantly weakens the incentive to work in some, but not all, countries. In Denmark, Iceland, Japan, Luxembourg, Netherlands, Norway, Poland, Slovenia and Switzerland, SA and HA raise RRs by 20 percentage points or more. But in Australia, the increase in RRs is modest at only 4 percentage points (from 40% to 44%). The impact of SA and HA in Australia is even less than that in the other Anglo-American countries.

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<sup>7</sup> For a recent review of the international literature that has a broader scope in regard to the links between housing and employment, see Gibb, Stephens et al. (2016).

**Table 1: Net RR summary measure of benefit entitlements with and without SA and HA, 2013**

<b>OECD countries</b>	<b>excl. SA and HA (%)</b>	<b>incl. SA and HA (%)</b>
Australia	40	44
Austria	52	55
Belgium	63	63
Canada	26	45
Chile	26	26
Czech Republic	21	52
Denmark	40	68
Estonia	24	41
Finland	49	66
France	49	57
Germany	41	53
Greece	22	22
Hungary	17	31
Iceland	41	64
Ireland	58	73
Israel*	23	42
Italy	23	23
Japan	23	60
Korea	20	36
Luxembourg	30	64
Netherlands	38	66
New Zealand	42	49
Norway	39	60
Poland	21	44
Portugal	43	51
Slovak Republic	22	39
Slovenia	25	53
Spain	39	48
Sweden	41	60
Switzerland	33	64
Turkey	23	23
United Kingdom	30	49
United States	26	32

*Note: The Net RR summary measure is defined as the average of the net unemployment benefit RRs for hypothetical households at two earnings levels, three family situations and 60 months of unemployment. Despite this heterogeneity in the cameos selected, the average will not necessarily reflect RR values for household types and earnings levels that differ from these cameos. And while the selected cameos may be common in some countries, they could be less so in others; so findings here are subject to important qualifications about representativeness.*

Source: *Tax and Benefit Systems: OECD Indicators*, available at <http://www.oecd.org/els/benefits-and-wages-statistics.htm>.

One of the earliest Australian studies on the impact of housing assistance measures on employment outcomes was King 2002. However, the study suffered from a key limitation in that it assumed housing assistance has a positive effect on employment participation, and it focused on investigating how large this positive employment effect has to be before government receives a positive return. This early study's assumption is highly restrictive; the literature now shows that generous income support programs can have adverse effects on individuals' labour supply decisions, although the magnitude of their impact may vary depending on the type of work incentive measure utilised.

There is now a body of Australian evidence highlighting the importance of housing assistance policies on the incentive to work. These studies tend to agree that financial incentives to work are substantially weaker among public housing tenants as compared to other segments of the population (Wood, Ong et al. 2005; Dockery, Feeny et al. 2008; Dockery, Ong et al. 2011). For instance, Dockery, Ong et al. (2011) show that the typical public housing tenant is able to replace 40 cents in every dollar of in-full-time-work income, while the rest of the population are only able to replace half that amount. Other studies have shed light on the effects of RRs on the decision to participate in employment (e.g. Whelan and Ong 2008; Wood, Ong et al. 2009; Dockery, Ong et al. 2011; Productivity Commission 2015). These studies generally show that housing assistance programs can have negative impacts on employment participation. However, the small magnitude of these impacts likely reflects the mediating effect of other barriers to employment, such as disability, transport costs and commuting, gender, and access to affordable child care.<sup>8</sup>

In relation to public housing assistance, welfare locks have been identified as another potential impediment to employment participation. The rationing of public housing, combined with low-income eligibility thresholds, is associated with declining employment activity among those queuing on public housing waiting lists. This is consistent with a 'welfare lock' effect, where individuals on waiting lists maintain their income below the minimum income limit in order to remain eligible. The effect arises if those in the queue job-search less intensively, or even decline job offers as they near the top of waiting lists. The welfare lock effect is particular to public housing because CRA is not rationed, and enrolment is automatic for those who are assessed as eligible for CRA.

Dockery, Feeny et al. (2008) present evidence in support of this welfare lock hypothesis and demonstrate that for males transitioning into public housing in Western Australia, the probability of being employed increases by 12 percentage points relative to employment prospects when remaining on the waiting list. For females, the employment gains are smaller, at 4 percentage points, yet still significant. However, it is unclear whether this increase in employment participation is actually the result of a welfare lock effect while on the waiting list, or a housing stability effect after entering public housing and being granted security of tenure. Findings presented by the Productivity Commission (2015) suggest that the housing stability hypothesis may indeed help to explain the substantially higher employment rates among public housing tenants compared to applicants.

Another strand of research has used behavioural microsimulation modelling techniques to evaluate the impact of various policy options on the incentive to work and employment participation. However, to date none have specifically focused on evaluating CRA and public housing programs. For instance, Kalb and Thoresen (2010) focused on income support payments to families with children, while Buddelmeyer, Freebairn et al. (2006) examined policy options that seek to modify the personal income tax structure and the design of allowance taper

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<sup>8</sup> For a review of the Australian evidence on the importance of these other barriers to employment, see Bridge, Flatau et al. (2003).

rates. This report will present research that combines microsimulation and econometric modelling techniques to estimate the effect that CRA and public housing programs have on the incentive to work and employment participation. Evidence of this kind helps to inform the design of policy reforms that can give the 'biggest bang for the buck' in terms of raising employment rates.

### 1.3.2 Housing wealth and the incentive to work

Less is known about the relationship between housing wealth and labour force participation, as a result of a paucity of empirical research in this area. The few published studies are focused chiefly on the association between housing wealth and retirement. This is an area of research that has attracted more attention in Australia since the turn of the century. Studies tend to report a statistically significant link between housing wealth and early retirement (Atalay, Barrett et al. 2016; Knox 2003; Warren 2013). Superannuation wealth also appears to have a modest, albeit significant, effect on retirement decisions (Warren 2013).

Knox (2003) uses HILDA to analyse the retirement intentions of respondents belonging to the baby boomer generation (born 1946–64). The author finds that home owners, irrespective of whether they are owner-purchasers or outright owners, intended to retire an average two years sooner (at 60 years of age) than renters or persons who lived rent free. A key methodological concern of this study relates to the author's approach in identifying persons intending to retire. The author selects persons who responded positively to the question 'At what age do you plan to retire from the workforce?', and omits from the empirical analysis any persons who had no plans to retire in the foreseeable future. This approach raises serious methodological concerns on the grounds of sample selection bias, as it is more likely for higher-income households to respond to this question. A two-step Heckman estimator would have addressed this limitation.<sup>9</sup>

In a more methodologically rigorous study, Warren (2013) uses standard and dynamic multinomial logit models to analyse the most common pathways into retirement for older Australians, using the first eight waves of HILDA. The author found that transitions from part-time employment to non-participation were higher among both men and women who have achieved outright ownership of their homes. Home equity and other household wealth are also important determinants in the retirement decisions made by men, but not women. Superannuation wealth is also featured as a significant influence on the likelihood of exiting the labour force, although its effect is only marginal.

In a recent Australian study, Atalay, Barrett et al. (2016) use waves 1–12 of HILDA to investigate the links between house prices, household debt and labour supply. In their analysis of the relationship between labour supply and housing wealth over the life cycle, the authors separately explore labour supply decisions by gender and relationship status. Using a fixed effects panel labour supply model and an instrumental variable approach, the authors find that older home owner females respond the strongest to house price changes, in terms of their decision to remain in the labour force as well as their choice of work hours. Middle-aged women in rental housing respond to house price increases by working harder, as reflected in higher labour market participation rates. The authors attribute the latter group's response to home ownership aspirations and efforts to relax borrowing and repayment constraints. In contrast, younger partnered persons who have already achieved home ownership reduce their hours of work in response to housing price (wealth) gains.

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<sup>9</sup> This two-stage estimator would in the first stage run a probit model in which the dependent variable represents whether a respondent has an intention to retire. The Mills ratio from this first stage regression is a measure reflecting the probability of having formulated a retirement intention; it is inserted into the second stage regression modelling intended age of retirement (see Wooldridge 2009: 600–613).



The above studies offer some important insights into the important role played by housing wealth in shaping individuals' labour market participation rates and their pathways into retirement, an area of growing policy importance.

### **1.3.3 Intergenerational transfer of wealth and the incentive to work**

Intergenerational transfers have a presence in the housing studies literature because housing assets are still the most important component of most households' wealth portfolio. The majority of households will therefore directly or indirectly draw down on housing wealth in order to finance inter vivos transfers, and it will be an important part of bequests. There is an emerging body of empirical research into the relationship between intergenerational wealth transfers and a range of housing, wealth and savings outcomes. There is now considerable evidence of links between transfers and home ownership (Boehm and Schlottmann 2001; Luea 2008; Spilerman and Wolff 2012; Kolodziejczyk and LethPetersen 2013; Mulder and Smits 2013; and Barrett, Cigdem et al. 2015b), savings behaviour (Engelhardt and Mayer 1998; Guiso and Jappelli 2002), consumption (Joulfaian and Wilhelm 1994) and labour supply (Brown, Coile et al. 2010; Holtz-Eakin, Joulfaian et al. 1993; 1999). Empirical research findings indicate strong and significant links between parental cash transfers, bequests and home ownership, with the common consensus being that both bequests/inheritances and parental transfers increase the probability of home ownership among beneficiaries in countries that include Australia (Barrett, Cigdem et al. 2015a, 2015b), France (Spilerman and Wolff 2012) and the United States (Boehm and Schlottmann 2001). Similarly, associations between savings habits and parental transfers have been confirmed. In a rare study on the links between savings behaviour and parental gifts, Engelhardt and Mayer (1998) found that for every dollar of transfer received from relatives, recipients' savings fell by 35 cents, while down payments on home purchases were increased by 60 cents. Similar findings were evident among Italian beneficiaries of inter vivos transfers (Guiso and Jappelli 2002)—these authors found that transfers reduced the period over which deposits were 'saved' by about two years, and also enabled recipients to purchase larger homes.

More mixed are findings with respect to labour supply and inheritances/transfers. Early findings by Holtz-Eakin, Joulfaian et al. (1993) indicated that in the United States generous inheritances depress a person's labour force participation. For instance, a person receiving a \$150,000 inheritance is four times more likely to exit the labour force as compared to someone who receives \$25,000. Relatedly, Brown, Coile et al. (2010) also found that receiving an inheritance increases the probability of retirement, especially among those who did not anticipate becoming a beneficiary. Results obtained by Holtz-Eakin, Joulfaian et al. (1999) are not so conclusive; inheritances appear to have little effect on retirement decisions in this earlier study. There are no known studies on the relationship between intergenerational transfers and labour force behaviour in Australia. This project addresses this void using robust empirical methods, which are described in the next section.

## **1.4 Research methods**

As mentioned in Section 1.1, this project draws on the HILDA Survey, a nationally representative panel survey of individuals and households that has been gathered since its inception in 2001. As is implied by the name, the survey also offers a wide range of variables, measured at both individual and household level, on the income, labour market and household dynamics of respondents. Survey respondents are tracked annually and data continues to be collected, with 2014 being the latest data year available for analysis. The survey started by tracking 7,682 households and 19,914 individuals and was topped-up in 2011 with an additional 2,153 households and 4,009 individuals. The main aim of the top-up sample was to make the survey more representative of the immigrant population in Australia since 2001 (Wilkins 2014).

In this project, we utilise the first 10 waves of the HILDA Survey and confine our analysis to persons aged 25 years and over<sup>10</sup>.

A critical first step in the analysis was to calculate RRs (the key measure of incentive to work used in this project<sup>11</sup>) for persons interviewed in HILDA wave 10<sup>12</sup>. To do this, we exploited AHURI-3M, a tax-benefit model that covers an exhaustive range of taxes and benefits over the period 2001–10. Benchmarked on the HILDA dataset, the model allows us to compute the RRs, factoring in the complex parameters of Australia's tax and benefit system.

One of the key contributions of this research project is in updating wave 10 RRs for persons who were (1) employed in period  $t$ , and (2) either unemployed or not in the labour force (NILF) in period  $t$ .<sup>13</sup> We also utilise the microsimulation model to simulate the effects of alternative housing assistance arrangements, such as measuring the magnitude of the effect of CRA on the incentive to work, or the implications of a financial bonus on the work effort of public housing tenants.

Once the RRs for wave 10 were calculated and the microsimulation model updated, we carried out the empirical analysis. We employ a variety of quantitative techniques to tackle the research questions. We begin in Chapter 2 by presenting a descriptive analysis of the work incentive trends of the employed, unemployed and those no longer in the workforce over the period 2001–10. We also offer descriptive breakdowns by wages and earnings. This is followed by transition matrices that reveal shifts in employment status across two consecutive waves, to observe the typical labour force pathways that individuals travel along from one year to the next. We build on this exercise using econometric modelling techniques to offer estimates of the extent to which interactions between tax provisions and benefit programs discourage continued engagement in employment, or the engagement in employment of previously unwaged individuals. Specifically, we employ random effects and multinomial logit models to estimate the probability that an individual who was employed (unemployed or NILF) in period  $t$  retains (gains) employment in period  $t+1$ , taking into account individuals' demographic and socio-economic characteristics, geographical location, wealth and, importantly, their RR variable to capture effects on the incentive to work. The models therefore exploit the panel nature of the dataset.<sup>14</sup> The work incentive measures incorporate housing allowance parameters, thereby permitting simulations that provide estimates of the direct impact of housing allowances on employment participation. Information on housing equity, mortgage debt and superannuation wealth offer a measure of their respective roles in shaping individuals' labour supply decisions.

'Nest egg' and indebtedness effects are likely to be especially important in the later stages of labour market careers. Logit and multinomial model specifications are therefore modified to include interactions between age and wealth, as well as debt variables. However, we choose to explore their importance in more depth, by selecting a sample of employed persons over the age of 45 and estimating hazard models of the duration of their continued participation in the labour force. We are especially interested in comparing the employment trajectories of mortgagors and outright owners—there being an expectation that the former group's employment ties are stronger.

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<sup>10</sup> We follow the example of Dockery, Ong et al. (2011) by excluding persons aged under 25 years.

<sup>11</sup> The RR is disposable income from all sources when not working expressed as a percentage of disposable income from all sources when in work.

<sup>12</sup> Replacement rates for earlier years were updated as part of earlier AHURI-3M updates.

<sup>13</sup> Prior to this project, RRs were only available for waves 1–9.

<sup>14</sup> These panel modelling approaches offer strengths over cross-section approaches to the identification of causal mechanisms. But as with all quantitative and qualitative methods, findings are subject to caveats.

In Chapter 4, we investigate ideas around the links between intergenerational transfers, employment and education using a propensity score matching approach.<sup>15</sup> We empirically examine these possible links by designing a control group whose labour market behaviour can be contrasted with a ‘treatment group’ who have received a bequest or cash gift over the study time frame (2001–10). HILDA identifies 2,064 individuals as having received a bequest over the study time frame and an even larger group (8,565) as having received cash transfers, so sample numbers are healthy enough to conduct such a research exercise.<sup>16</sup>

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<sup>15</sup> See Barrett, Cigdem et al. (2015b), where this technique is explained and applied.

<sup>16</sup> More information on the modelling approaches is provided in the methods sections of the individual chapters.

## 2 Impact of the tax and benefit system on the incentive to work—descriptive analyses and modelling results

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- The analysis in this chapter employs a combination of microsimulation and econometric modelling techniques to estimate the effect that housing, and especially CRA and public housing programs, have on the incentive to work and employment participation.
  - The empirical analysis supports the following key findings:
    - Housing assistance to private rental and public housing tenants has few employment effects.
    - Rising levels of mortgage indebtedness appear to be extending working lives.
    - Higher levels of housing wealth seem to help older ‘inactive’ (NILF) owners regain employment, and help precariously employed younger home owners secure their employment.
  - Reforms designed to strengthen housing assistance clients’ financial incentives to work will have only small employment effects. An integrated approach that addresses barriers to employment is more likely to be successful.
  - If rising house values and increasing mortgage debt raise employment rates, as the evidence suggests, there is a positive productivity spin off. However, the rising levels of indebtedness are a threat to housing market stability. Moreover, debt stress is associated with lower levels of wellbeing. So, there is a downside that warrants caution when welcoming these positive housing market influences on employment.
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### 2.1 Introduction

Two key questions are addressed in this analytical chapter.

- Do different government transfer programs, and especially housing assistance, blunt the incentive to work? How do any such effects vary by age cohort, wage range, geographical location and individual/demographic characteristics?<sup>17</sup>
- What are the impacts, in terms of direction and magnitude, of Australia’s tax and benefit system—particularly housing assistance—on employment participation decisions?

We begin our results section with a series of descriptive exercises that document incentive to work, as indicated by estimates of RR measures. These measures are based on a microsimulation model (AHURI-3M) that is capable of combining the socio-economic data in HILDA with a tax-benefit module that allows calculation of tax liabilities and eligibility (as well as entitlements) for income support programs, including housing assistance. We then model transition flows into and out of employment, with a view to identifying the key drivers of these transitions. We are especially interested in housing-related variables and the impacts that

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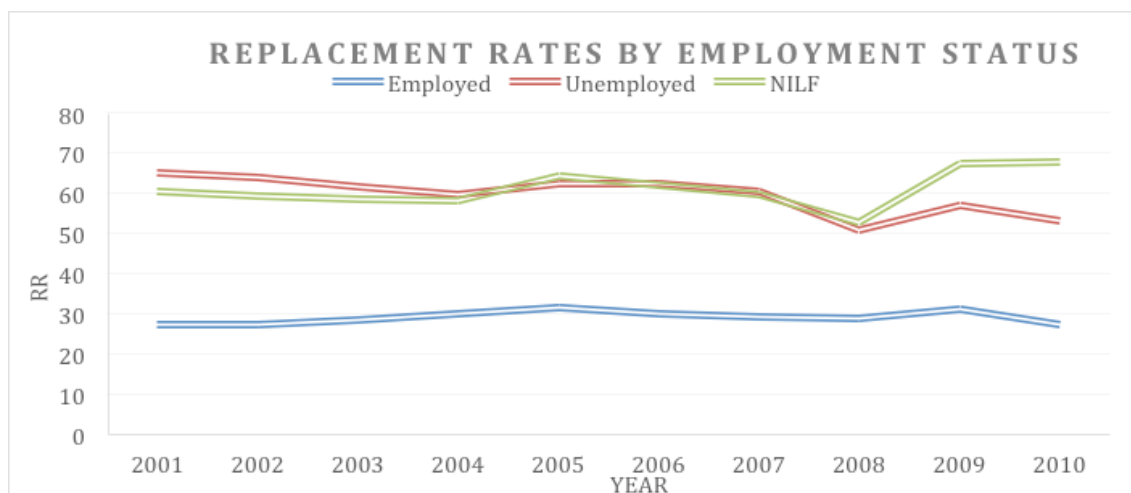
<sup>17</sup> For space reasons only a selection of cross-tabulations are reported in this final report. The full range of descriptive tables were presented in an Inquiry Panel report and are available from the authors upon request.

housing assistance might have on incentive to work and hence labour supply. A final concluding section discusses key findings and their policy implications.

## 2.2 Results

Figure 1 presents the median RR profiles of three groups—the employed, unemployed and those not in the labour force—in each year of the sample time frame (2001–10). For the typical employed person, income when not working will replace a little under one-third of income when working. For most there is therefore a serious financial ‘penalty’ on losing employment. Among the employed there is some evidence of an upturn in RRs over the years 2001–09. But there is a sharp fall in 2010, such that median RRs end the study time frame a little below the rate at the onset of the study time frame. In the years 2001–09 the upward drift was due to sluggish wage growth (an annual average increase in median nominal earnings of 4.9%). But in 2010 wage growth accelerated, and average income support payments that a worker would be entitled to on transitioning out of work fell from \$17,237 in 2009 to \$15,646 in 2010.

**Figure 1: Median RRs by employment status, 2001–10**



*Note: The dataset is based on an unbalanced person-period design covering years 2001–10 and comprising responding persons within HILDA who are aged 25 and over in any one wave and who are either employed, unemployed or NILF in time  $t$  (i.e. those aged say 24 in wave 3 and who turn 25 by the HILDA interview date in wave 4 are retained in the sample from waves 4 onwards).*

Source: Authors' own calculations from the 2001–10 HILDA Survey.

The incentive to work is very blunt among the unwaged who are not seeking work, but is also weak among the unemployed. The unemployed end the first decade of the new millennium with RRs of between 50 and 60 per cent; with RRs nearing 70 per cent for those who have dropped out of the labour force. The median RR measure is more variable among the ‘unwaged’, with no discernible overall trend over the time frame 2001–10, though in 2009 and 2010 there is a sharp increase in the RR of those not in the labour force.

There is considerable inequality in the distribution of wages in Australia. In 2010, annual wage and salaries at the 90th percentile was almost five times the annual wage and salaries at the 10th percentile of the wage and salary distribution. This disparity in wage and salary income hints at a different pattern to work incentive across the wage distribution. Table 2 explores this notion by grouping the 2010 sample of *wage earners* into 10 equal groups, ranked from lowest to highest according to their annual gross wages and salaries. The median RR comparisons reveal a marked difference in the incentive to work. Roughly 70 per cent of the annual income of the bottom 10 per cent of all employed persons is replaced on leaving employment, but only a

little over 10 per cent is replaced when annual wages place a person among the highest 10 per cent of wage earners. The Incentive to work is thus blunt at the bottom end of the wage distribution.

**Table 2: Median RR by wage decile, 2010**

Wage deciles	Wage range (\$)	RR (%)	Median annual wage (\$'000s)
1 Lowest	1,040–21,892	70.9	14.8
2	22,100–32,240	45.8	27.9
3	32,292–39,104	38.5	36.4
4	39,156–46,800	33.5	43.6
5	46,852–52,260	28.9	50.3
6	52,364–60,164	26.5	57.2
7	60,268–69,992	23.3	65.0
8	70,148–82,732	19.7	77.5
9	82,784–104,000	16.8	92.7
10 Highest	104,052–416,416	11.2	135.3

*Notes: The dataset is as described in note below Figure 1. The wage measure is individuals' annual gross wages and salaries from all jobs in 2010.*

Source: Authors' own calculations from the 2001–10 HILDA Survey.

In Table 3 the HILDA panel dataset is used to identify the labour market transitions made by our sample members. This research exercise yields a transition matrix. In the left-hand panel of Table 3, the sample design comprises those persons employed in any one year (year  $t$ ). Each row then describes labour market status one year later. Consider the 2001 row, for example. Of those in the HILDA dataset that were employed in 2001, 93 per cent continue in employment one year later—on the other hand, 5 per cent are no longer in the labour force and 2 per cent become unemployed. In subsequent years, employment-to-employment transitions initially become stronger, but during the GFC years, shifts into unemployment or out of the labour force become a little more likely. Nevertheless, the overall picture is one of enduring employment year-on-year.<sup>18</sup> Table 3 also reports the transitions made by those that are unemployed in any one year (see middle panel). This time the subsequent transitions one year later are much more evenly spread across the three labour market categories. Moves from unemployment to employment are most common, accounting for between 41 per cent and 53 per cent of shifts out of unemployment over the sample time frame. The other transitions are roughly evenly split between flows out of the labour force and those whose unemployment persists. Finally, we examine those not in the labour force; here the initial status tends to endure. In all years, around 90 per cent remain 'inactive'. Thus it would seem that the boundaries separating unemployment from employment and NILF are most porous. On the other hand, when a person is either employed or not in the labour force, that status is durable, with these groups exhibiting relatively little movement either within the labour force, or into and out of the labour force.

<sup>18</sup> We can also track the 2001 sample's future employment outcomes for nine years. There is a gradual decline in *continuous* employment participation; 87 per cent of the 2001 cohort is still employed five years later, dropping to 80 per cent nine years later.

**Table 3: Employment status transition matrix, 2001–10**

Year $t$	Employed year $t$ – employment status in $t+1$ (%)			Unemployed year $t$ – employment status in $t+1$ (%)			NILF year $t$ – employment status $t+1$ (%)		
	Unemp.	NILF	Emp.	Unemp.	NILF	Emp.	Unemp.	NILF	Emp.
2001	1.6	5.3	93.1	31.9	26.7	41.4	1.8	90.5	7.7
2002	1.3	4.9	93.9	26.2	33.3	40.5	1.7	91.3	7.0
2003	1.2	5.0	93.9	25.6	30.8	43.6	1.7	90.7	7.6
2004	1.2	4.5	94.3	25.4	26.8	47.8	1.7	89.4	8.9
2005	1.2	4.6	94.2	26.3	20.4	53.3	1.8	91.4	6.8
2006	1.2	4.7	94.1	26.1	27.6	46.3	1.5	91.4	7.0
2007	1.2	4.0	94.8	18.8	32.0	49.2	1.2	92.0	6.8
2008	1.7	5.0	93.3	30.6	31.5	37.8	1.4	93.3	5.2
2009	1.7	4.3	94.0	31.0	25.6	43.4	1.3	92.6	6.1

*Notes: The dataset is based on a person-period design that is balanced between period  $t$  and  $t+1$ . Sample design is once again confined to HILDA respondents aged 25 years and over.*

Source: Authors' own calculations from the 2001–10 HILDA Survey.

While high RRs among subgroups like the unemployed might signal policy concerns, their role in shaping employment decisions should first be ascertained before any strong policy conclusions emerge. We turn to these behavioural issues in the next section.

### 2.2.1 Impact of the tax and benefit system on the incentive to work—modelling estimates

We start by reporting findings from an analysis of year-to-year transitions made by those *employed* in wave  $t$ . The estimates are generated from a random effects logit model. It models the odds of retaining employment in period  $t+1$  ( $2002 \leq t + 1 \leq 2010$ ) for all individuals aged 25 and over, conditional on being employed in period  $t$  ( $2001 \leq t \leq 2009$ ). We begin by discussing the logit model estimates where the focus is on the factors shaping loss of employment. The dependent variable equals 1 if a person is employed *in*  $t+1$  (their employment is enduring), 0 if they are unemployed or NILF in  $t+1$ . The model is therefore analysing the strength of employment ties.

Our major interest is in the role of RRs, which will in part reflect housing assistance, as well as the direct effects that housing wealth and mortgage debt might have on the bonds that cement employment ties. The other major component of wealth—superannuation—is added as an explanatory variable. Since wealth accumulation and indebtedness is expected to play an especially important role in the continued employment participation decisions of employees as they approach pension age, we interact the wealth and debt variables with age group dummies (45–54 years; 55–64 years; and 65 years and over). We also include various personal characteristics as controls (see note to Table 4).<sup>19</sup> All explanatory variables are lagged one wave to help address endogeneity issues. The coefficients in a logit model do not have a ready interpretation; we therefore report estimated odds ratios. In the case of continuous variables, it is the ratio of odds occurrence with respect to a one unit difference in the predictor. To illustrate,

<sup>19</sup> Table 4 reports the estimates obtained for key variables. We can, however, report that older workers, the disabled, Indigenous, those completing year 11, and those partnered by someone with relatively high income are found to have weaker attachments to employment.

consider the RR variable in Table 4. The odds ratio estimate 0.98 indicates that a 1 percentage point increase in the RR lowers the odds of remaining employed by 2 per cent. This odds ratio estimate confirms the importance of RRs. They are precisely estimated as indicated by their strong statistical significance.

Housing assistance increases RRs. For example, among those eligible for CRA, median RRs are 60 per cent; but in the absence of CRA, the median falls to 58 per cent.<sup>20</sup> We can use these imputed RRs to estimate CRA's impact on employment attachments by using the logit model coefficients to predict the probabilities of continued employment over the sample time frame. Our findings suggest that its impact is very small. At actual RRs with CRA present, we forecast continued employment among 91.1 per cent of employed CRA clients. At imputed RRs that assume no CRA, predicted continued employment is increased to 91.4 per cent. This is a negligible impact (less than 1%) and is in part due to the very high year-on-year employment rate in the sample that limits the scope for any further increase. However, it also reflects the small influence that CRA has on RRs.

The other housing-related work incentive measures (mortgage debt, house value) yield interesting findings. More indebted older home owners are found to have stronger employment attachments. This is especially important among the cohort (55–64 years) approaching pension age, where our model implies that a mortgagor who takes on a \$100,000 larger mortgage, has odds of continuing in employment that are 1.18 times those of a mortgagor in the same age cohort but with a \$100,000 smaller mortgage. This finding has potentially important implications for future employment participation among mature-age workers.<sup>21</sup> In the last 30 years, the proportion of home owners with a mortgage in this age cohort has soared, as has their typical outstanding mortgage debt (see Wood 2015). Increasing employment participation among older workers can ameliorate the fiscal stress on government budgets that is associated with an ageing population. It is intriguing to note that an easing of this fiscal stress could come about as a result of growing indebtedness in the household sector.

According to the logit model estimates, larger amounts of superannuation wealth weaken employment ties among all persons aged over 45—an individual who has accumulated an extra \$10,000 in a superannuation account is 1–2 per cent less likely to continue in employment than would be the case in the absence of this \$10,000. Finally, the house value (gross housing wealth) interactions with age dummies are inconclusive. It would seem that households that have benefited from large capital gains and/or aggressively traded up in owner-occupied housing markets are just as likely to remain employed as they approach pension age as those with relatively low amounts of gross housing wealth.

The merging of the unemployed and NILF categories is a limitation of the logit model estimates. It assumes that the effect of a variable such as age on attachments to employment is the same whether the alternative is unemployment or leaving the labour force. Multinomial models address this by viewing individuals as choosing between a menu of alternatives, and the convention is to present such a choice in terms of a utility maximisation framework, with utility a

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<sup>20</sup> Among those who were employed in period  $t$ , 618 individuals (or 2,302 person-periods, which amounts to around 5.3% of the sample) were eligible for CRA between years 2001 and 2009.

<sup>21</sup> The following observations are subject to an important caveat. While the logit model controls for various personal characteristics, and effectively lags wealth and debt variables to address simultaneity, there remain potential endogeneity problems due to omitted variables. For example, the higher mortgage debt could be the preferred choice of those who had always expected to extend working lives beyond pension age given planned consumption profiles over the life course. There are those that have added to mortgages in order to smooth or bring forward consumption, and who were prepared to do so because they expect to work beyond pension age. They therefore achieve a preferred consumption profile over their life cycle. It is not the higher mortgage debt that is cementing employment ties but increasing longevity and plans to work longer.



function of the person's characteristics (or attributes of the alternatives).<sup>22</sup> Thus the probability of choosing one alternative (e.g. employment) over another (say NILF) is dependent on which yields the higher utility. The multinomial model assumes that this choice (the utilities associated with employment and NILF) is independent of the utility level associated with a third alternative (in this example, unemployment).

Table 4 offers odds ratio estimates in the three choice cases (employment, unemployment and NILF) where the model includes the same vector of key variables and controls as the binary logit model. The findings generally confirm our predictions and offer richer insights. A higher RR is an important negative influence on the chances of remaining employed relative to either unemployment or NILF, but a little more so in relation to shifts out of the labour force.

Higher home values for under 45s favour continued employment relative to unemployment. The effect is quite large; a \$100,000 boost in home value leaves the odds of continued employment at 1.14 times the odds of unemployment. This could reflect a collateral effect, whereby those younger workers whose employment is threatened are better able to 'go it alone' if they can draw on housing equity to help start a business. By the time owner-occupiers reach middle age, home values' influence on employment participation choices has reversed. Beyond age 45, increases in home values cut the odds of continued employment relative to unemployment. These effects work in the same direction for both the 45–54 and 55–64 year age groups, but are stronger among those approaching pensionable age. Higher home values for the under 45s are an insignificant influence on the odds of continued employment relative to *exiting the labour force*, but do have a positive effect on employment *relative to exiting the labour force* for the 45–64 year olds, albeit at the 10 per cent significance level.

An intriguing aspect of the multinomial findings is the changing role of mortgage debt across the life course. While mortgage debt is unimportant to the employment decisions of under 45s, it becomes a key factor strengthening employment ties among those approaching pension age (55–64 years). In this age group, an owner-occupier with a \$100,000 larger mortgage has odds of continuing in employment that are 1.21 times the odds of withdrawing from the labour force (though not a significant influence on the choice between continued employment and unemployment).

At conventional levels of significance, the superannuation balances of under 45s are positively associated with continued employment relative to either unemployment or NILF. This cannot be a collateral effect, as this age group have yet to reach the preservation age. We likely have an omitted variable bias problem here—for example, those with larger superannuation balances might also be found in more secure forms of employment<sup>23</sup>. Changing patterns over the life cycle are evident when we examine the amounts accumulated in superannuation balances. These balances are positively associated with employment ties among the young (under 45s), but by middle age those ties are more likely to unravel the larger are their superannuation balances. For example, among owners aged 55–64, a \$100,000 increase in superannuation (home value) lowers the odds of continued employment relative to exiting the labour force by 1.1 per cent (14.6%).

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<sup>22</sup> If it is assumed that utility only depends on the characteristics of the person, it belongs to the multinomial logit subclass of models. If it is assumed that choice is solely the function of the attributes of the alternatives (the characteristics of the person are irrelevant) it belongs to the conditional logit subclass of models.

<sup>23</sup> There is evidence supporting this suggestion; those employed on a permanent or ongoing basis have accumulated median superannuation balances (\$85,000) that are twice those of the median balances accumulated by those employed on a casual basis (\$42,353).

**Table 4: Odds ratio estimates of the probability of retaining employment in time  $t+1$  as opposed to (1) becoming unemployed; or (2) moving out of the labour force, 2001–10**

Variables <sup>25</sup>	Random effects logit	Multinomial logit <sup>24</sup>	
	emp. in $t+1$ vs unemp. or NILF in $t+1$	emp. in $t+1$ vs unemp. in $t+1$	emp. in $t+1$ vs NILF in $t+1$
RR (%)	0.984*** (0.00105)	0.987*** (0.00199)	0.985*** (0.000995)
Primary home debt (\$00,000s)	1.035 (0.0349)	1.024 (0.0739)	1.024 (0.0340)
Home value (\$00,000s)	1.017 (0.0184)	1.138*** (0.0475)	0.986 (0.0163)
Superannuation wealth (\$0,000s)	1.011*** (0.00308)	1.022*** (0.00704)	1.008*** (0.00303)
Aged 45–54* Primary home debt (\$00,000s)	1.036 (0.0625)	1.088 (0.124)	1.035 (0.0668)
Aged 55–64* Primary home debt (\$00,000s)	1.182** (0.0937)	0.965 (0.136)	1.211** (0.0965)
Aged 65 and over* Primary home debt (\$00,000s)	1.180 (0.215)	0.668 (0.276)	1.172 (0.192)
Aged 45–54* Home value (\$00,000s)	1.017 (0.0262)	0.885** (0.0443)	1.048* (0.0276)
Aged 55–64* Home value (\$00,000s)	0.994 (0.0254)	0.854*** (0.0489)	1.040* (0.0246)
Aged 65 and over* Home value (\$00,000s)	1.025 (0.0348)	1.575 (0.441)	1.044 (0.0302)
Aged 45–54* Superannuation wealth (\$0,000s)	0.989*** (0.00368)	0.983** (0.00798)	0.990*** (0.00366)
Aged 55–64* Superannuation wealth (\$0,000s)	0.987*** (0.00343)	0.989 (0.00918)	0.989*** (0.00328)
Aged 65 and over* Superannuation wealth (\$0,000s)	0.988*** (0.00426)	0.975** (0.0124)	0.992** (0.00394)
Observations	37,419	37,419	37,419
Number of persons	7,892		

Notes: Standard errors of the odds ratios in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Models also include controls for demographics and health characteristics (including age range dummies for persons aged 45–54, 55–64 and 65 and over), human capital, labour market status and income, as well as annual wave indicator variables and controls for Major Statistical Regions (variables to denote state capitals and balance of state). Complete coefficient results are available from the authors upon request.

Source: Authors' own calculations from the 2001–10 HILDA Survey.

<sup>24</sup> Multinomial results are based on two separate models run with a different base category: the first model uses unemployment as its base category and reports the odds of remaining employed in  $t+1$  as compared to being unemployed in  $t+1$ , while the second model uses NILF as its base category and estimates the odds of remaining employed in  $t+1$  as opposed to exiting the labour force (model 2).

<sup>25</sup> See Appendix 1 for a list of variable names and their corresponding definitions.

In Table 5 we shift our attention to the unwaged (unemployed and NILF) and the analysis of variables influential in determining the probability of *gaining* employment in wave  $t+1$  conditional on being unwaged in wave  $t$ . Consider first the odds ratio estimates obtained from a logit model of re-engagement with employment (see first column in the table); all explanatory variables are again measured at wave  $t$ . The key RR variable lowers the chances of a move into employment; in this model, a 1 percentage point increase in the RR lowers the odds of gaining employment by 1.4 per cent relative to the odds of remaining unwaged. Housing debt and wealth are unimportant as far as younger (under 45 years) age groups are concerned, in part because rates of home ownership are lower among young people, especially if unemployed or not in the labour force.<sup>26</sup> However, once our sample reach middle age, housing debt variables become very important; a home buyer aged 45–54 (55–64) with a \$100,000 additional mortgage debt burden has odds of gaining employment that are 39 per cent (40%) higher than those of the less indebted home buyer. Those occupying homes with a higher home value are also more likely to find an employment opportunity, especially the group aged between 55 and 64 years. An important control when trying to measure the effects of these housing variables is superannuation balances—though these balances are found to make moves into employment less likely, they are statistically insignificant.

We can simulate the effects of housing assistance on re-engagement (with employment) rates by using this logit model's coefficient estimates to forecast probabilities of gaining employment over the sample time frame. Among the unwaged who are eligible for CRA, median RRs are 67 per cent; but in the absence of CRA the median falls to 60 per cent.<sup>27</sup> Our findings indicate that at actual RRs, employment is predicted to be only 17.0 per cent of CRA clients that were unwaged one year previously. At imputed RRs that assume no CRA, employment is increased to 17.4 per cent, a 0.4 percentage point increase in the employment rate. While CRA eligible clients are a higher proportion of the unwaged than they are of the employed, the small impact is more to do with a modest fall in the RR of CRA eligible clients.

A multinomial model is also estimated on a sample of persons who were unwaged in period  $t$ . RRs remain a significant indicator of employment status in the next wave, with a 1 percentage point increase in the RR reducing the odds of employment by around 2 per cent (1%) as compared to unemployment (NILF), and marginally increasing the odds of unemployment versus NILF. Similarly, primary home debt appears to be an important driver among the under 45s and the scale of the effect is substantial; a \$100,000 increase in mortgage debt increases the odds of employment relative to unemployment by around 20 per cent. Home value and superannuation wealth are unimportant determinants of employment status in  $t+1$  among this younger age cohort; however, they do gain importance among the older cohorts. Home value has a significant role in determining transitions into employment versus out of the labour force in  $t+1$  across all three of the older age cohorts. Superannuation wealth produces significant effects among those approaching pensionable age, but not among the 45–55 years group, or those in the oldest cohort. For persons aged 55–64, a \$10,000 boost in superannuation wealth increases the odds of employment by around 2 per cent relative to unemployment. Labour force attachments are generally stronger among those with higher mortgage debt and this is particularly the case for those approaching retirement age. For the 55–64 years cohort, a \$100,000 increase in mortgage debt increases their odds of gaining employment relative to NILF by around 32 per cent.

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<sup>26</sup> The home ownership rate among those aged under 45 is 46.3 per cent for all persons, irrespective of their employment status in  $t+1$ ; it is 44.3 per cent among the unemployed and NILF in  $t+1$ . The home ownership rate in the all age groups whole sample is 70.1 per cent.

<sup>27</sup> Among those who were employed in period  $t$ , 790 individuals (or 3,681 person-periods, which amounts to around 13.3% of modelling sample) were eligible for CRA in years 2001–09.

**Table 5: Odds ratio estimates of the probability of gaining employment in time  $t+1$  as opposed to (1) remaining unemployed; or (2) remaining out of the labour force, 2001–10**

Variables	Random effects logit	Multinomial logit	
	<i>emp. in <math>t+1</math> vs unemp. or NILF in <math>t+1</math></i>	<i>emp. in <math>t+1</math> vs unemp. in <math>t+1</math></i>	<i>emp. in <math>t+1</math> vs NILF in <math>t+1</math></i>
RR (%)	0.986*** (0.00148)	0.981*** (0.00206)	0.988*** (0.00107)
Primary home debt (\$00,000s)	1.015 (0.0444)	1.191* (0.110)	1.011 (0.0315)
Home value (\$00,000s)	0.994 (0.0225)	1.027 (0.0388)	0.983 (0.0150)
Superannuation wealth (\$0,000s)	1.001 (0.00324)	0.998 (0.00306)	1.001 (0.00216)
Aged 45–54* Primary home debt (\$00,000s)	1.385*** (0.118)	1.129 (0.202)	1.257*** (0.0768)
Aged 55–64* Primary home debt (\$00,000s)	1.404*** (0.140)	0.722** (0.108)	1.320*** (0.0948)
Aged 65 and over* Primary home debt (\$00,000s) <sup>^</sup>	1.297 (0.279)	NA NA	1.246 (0.205)
Aged 45–54* Home value (\$00,000s)	1.023 (0.0321)	1.058 (0.0567)	1.040* (0.0223)
Aged 55–64* Home value (\$00,000s)	1.404*** (0.140)	1.018 (0.0562)	1.047** (0.0224)
Aged 65 and over* Home value (\$00,000s)	1.045* (0.0276)	1.474 (0.365)	1.048*** (0.0189)
Aged 45–54* Superannuation wealth (\$0,000s)	0.998 (0.00414)	0.999 (0.00536)	0.998 (0.00292)
Aged 55–64* Superannuation wealth (\$0,000s)	0.999 (0.00375)	1.018** (0.00742)	0.999 (0.00253)
Aged 65 and over* Superannuation wealth (\$0,000s)	1.002 (0.00427)	0.998 (0.0194)	1.002 (0.00305)
Observations	27,709	27,709	27,709
Number of persons	5,799		

Notes: See Table 4 notes. <sup>^</sup>Variable was omitted from the multinomial model estimating transitions into employment in  $t+1$  versus unemployed in  $t+1$ , as a result of too few records of persons aged 65 and over and in mortgage debt. \* statistically significant at 10 per cent; \*\* statistically significant at 5 per cent; \*\*\*statistically significant at 1 per cent.

Source: Authors' own calculations from the 2001–10 HILDA Survey.

## 2.3 Policy development implications of empirical findings

The findings in this chapter have potential policy development implications in the areas of housing assistance, fiscal policy and monetary policy.

### 2.3.1 Housing assistance

Our model estimates indicate that CRA has minimal negative impacts on employment participation. Among those of working age and eligible for CRA, but either *unemployed or not in the labour force*, its removal would increase the predicted rate of subsequently *gaining employment* from 17.0 per cent to 17.4 per cent.<sup>28</sup> This could be because its design ensures that no CRA is withdrawn until the income support payment it is attached to is reduced to zero.<sup>29</sup> On isolating a perhaps more 'work ready' sample of those that are working age and eligible for Newstart or Youth allowance, the effect when taking away CRA is again modest, raising the predicted rate of subsequently gaining employment from 19.7 per cent to only 20.2 per cent. Hence, any scope for CRA reform should ideally focus on indexation and targeting concerns, rather than the design of the program to increase employment participation rates.

While public housing tenants have very low employment participation rates, our results suggest that public housing is not the problem per se. Public housing tenants are a severely disadvantaged group who face a range of barriers to employment. As indicated in the case study reported below, reforms that strengthen financial incentives to work will have only small effects on employment rates. An integrated approach that addresses barriers to employment for those in public housing (e.g. drug and alcohol abuse, mental health problems, skills deficiencies and so on) has a better potential to improve the employment outcomes of tenants.

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<sup>28</sup> The pool of working-age persons affected in any one year of the study period is roughly equivalent to 9 per cent of all working-age persons.

<sup>29</sup> The absence of an employment effect could simply reflect a strong work ethic that overrides financial motives. We are grateful to a peer reviewer for suggesting this interpretation.

### Box 1: Case study: public housing tenants and employment bonuses

Both the McClure report (2015) and Productivity Commission report (2015) have put forward proposals that are expected to increase employment participation rates among public housing tenants. The McClure report recommends extending eligibility for CRA to tenants in public housing, but this extension of assistance is to be accompanied by housing authorities setting market rents instead of concessional rents (which are typically 25% of assessable income). The reforms will sharpen the incentive to work because rents no longer increase when tenants find work.<sup>30</sup>

In the 2015 Productivity Commission report there is a recommended extension of the Job Commitment Bonus<sup>31</sup> to all public housing tenants in receipt of income support payments. The Commission seeks to incentivise public housing tenants by financially rewarding unwaged tenants who find employment. The program could operate by offering a cash bonus to tenants who find a job and receive an employment income that is high enough, over a set amount of time, to cause a reduction in their income support payments. The practical implementation might involve returning a proportion of their withdrawn income support payments 'once they have passed employment milestones. Bonuses could be paid in instalments, for example after three and 12 months in continuous employment; a higher amount could be paid to those who also move out of public housing' (Productivity Commission 2015: 63).

We have used the multinomial model, whose findings are reported in this chapter, to estimate the likely impact of such a bonus on employment participation rates. The bonus has been set at \$2,500<sup>32</sup> and added to the denominator in RR formulae. We compare the predicted rates of employment with and without the bonus included in RR calculations. The comparison is conducted for two subgroups among public housing tenants.

- Working age tenants who are eligible for ISPs. We estimate that their median replacements rates will fall from 75 per cent to 68 per cent, if employment is sustained for 12 months.
- Public housing tenants eligible for Newstart or Youth allowance. We estimate that their median RRs will fall from 81 per cent to 71 per cent if employment is sustained for 12 months.

Despite the significantly larger financial rewards from employment, the model predicts that a little under 1 in 100 tenants eligible for Newstart or Youth allowance would become employed. An even lower increase in employment rates is anticipated among the larger group of working-age income support payment recipients.<sup>33</sup> These findings reflect the targeting of public housing by the most disadvantaged in our population. Public housing tenants typically face multiple barriers to employment, as evidenced by the importance of variables representing biographical disruption and socio-economic disadvantage in multinomial models of labour force status, and their high incidence among public housing tenants.

### 2.3.2 Broader policy concerns

Tax preferences for owner-occupied housing and historically low interest rates have inflated house prices and therefore housing wealth. But they have also encouraged growing indebtedness, as home buyers have to borrow more to finance purchases at higher real house prices, and in situ owners add to their mortgages in order to cash in some of their housing wealth gains. The implications of these findings differ across age cohorts.

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<sup>30</sup> Feeny, Ong et al. (2012) report findings from an evaluation exercise.

<sup>31</sup> For more information on the Job Commitment Bonus, refer to the Department of Human Services (DHS) website: <https://www.humanservices.gov.au/customer/services/centrelink/job-commitment-bonus>.

<sup>32</sup> This is the current bonus amount (as at July 2016) granted to persons who are continuously employed for 12 months. A further \$4,000 is granted to persons who remain continuously employed for 24 months.

<sup>33</sup> Rates of employment are predicted to increase from 14.98 per cent (10.79%) to 15.3 per cent (10.81%) among Newstart Allowance (Youth Allowance) recipients.

Among younger (under 45 years) home owners who are employed, higher home values seem to favour continued employment relative to unemployment. There also appears to be a positive effect on older 'inactive' (NILF) home owners' chances of regaining employment. We speculate that such outcomes might be due to a collateral effect. Home owners fortunate enough to have accrued large capital gains and whose employment is threatened, or who indeed lose their jobs, have the option to finance business start-ups or self-employment initiatives. Further research is required to document these links. But if confirmed the research would indicate a wider economic role for owner-occupied housing, which policy-makers might wish to encourage—though some might express concern about the rising indebtedness that is a consequence (see below). The uncertainty surrounding our results and their wider significance are highlighted by contradictory findings presented in recent AHURI research by Atalay, Barrett et al. (2016), which show that higher house price growth results in reduced labour market participation for older women and younger partnered couples. The evidence on links between housing wealth, house prices and employment outcomes are mixed, but they deserve further attention from researchers because they have potentially important implications for our national economy.

Our analysis does concur with Atalay, Barrett et al. (2016) in finding that higher mortgage indebtedness is linked with stronger labour market ties. Growing indebtedness among Australian home owners approaching retirement appears to be prompting longer working lives. These higher levels of mortgage debt are in part the product of higher real house prices that reflect capitalisation of tax concessions as well as historically low interest rates. While policy-makers might welcome these labour market consequences—longer working lives will help promote the Australian economy's productivity growth in future years—there is a downside. These longer working lives might not be welcome if they are unplanned among those carrying debt later in their lives. Moreover, when large numbers of heavily indebted owner-occupiers come to rely on continued house price gains and low interest rates, the resilience of housing markets and the broader economy is undermined.

Previous research has also shown that repayment risk in mid-to-late life is highly correlated with adverse life events such as marital breakdown and unemployment (Ong, Jefferson et al. 2013b). Moreover, Cigdem, Ong et al. (forthcoming) find that mortgagors with debt stress have lower levels of wellbeing (in both Australia and the United Kingdom). The growing use of owner-occupied housing as collateral to leverage self-employment may therefore come at a cost. Finally, while higher debt might be taken on in anticipation of longer working lives, unexpected life events (e.g. ill health) can seriously disrupt such plans. In that eventuality it is possible that lump sum superannuation pay outs will be used to pay down mortgage debt.

### 3 Housing wealth, mortgage debt and employment ties: a closer look

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In this chapter we take a closer look at those approaching retirement age (45–64 years) and the factors shaping decisions to withdraw from the labour force. The empirical work uses hazard models to analyse the duration of spells in the labour force. Among those aged 45–54 years of age, year-on-year transitions out of the labour force average 5 per cent over the study period; in the older 55–64 years subgroup, year-on-year exits out of the labour force average 16 per cent. Most of those transitioning out of the labour force do not return before the end of the study period (2010) and are most likely permanently retired.

- On controlling for measurable personal characteristics we learn that mortgagors in both age cohorts have stronger labour market ties. In the younger (older) age group the odds of leaving the labour force are only 19 per cent (27%) of outright owners' odds of leaving the labour force (all else being equal).
- The amount of housing equity that an owner-occupier has stored in their homes has no straightforward impacts on decisions to leave the labour force. Furthermore, the size of superannuation balances is not correlated with decisions to leave the labour force. We think this is because those with larger superannuation savings are more likely to be employed on permanent contracts.
- Those in the older group (55–64 years), who are approaching pensionable age, can fall back on an income buffer that on average replaces nearly 50 per cent of their in-work income. However, the modelling results fail to detect statistically significant effects from a RR variable representing the fraction of income that is replaced on transitioning out of the workforce.
- Social and demographic characteristics important in accelerating transitions out of the labour force include permanent disability, 'empty nester' status and superior educational qualifications.

The empirics suggest that the trend to repayment of mortgages later in life could have important economy-wide effects. It is associated with longer working lives and could therefore help offset some of the productivity consequences that arise due to an ageing population.

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#### 3.1 Introduction

Soaring house prices have helped baby boomers to accumulate large amounts of housing wealth. Generations X and Y have been less fortunate, because they had to borrow more in order to purchase homes at inflated prices. Some baby boomers have also become more indebted as a result of equity withdrawal, helped along by the emergence of flexible mortgages that allow the mortgagor to tap into their housing equity without moving or refinancing. In view of these developments, we ask the following key research question.



*What role does housing wealth and mortgage debt play in shaping employment participation decisions at different stages of individuals' employment life cycles?*

We focus on those aged 45–64 years in 2001 who are approaching retirement over the study period (2001–10). This is a key group for policy-makers as employment participation wanes as retirement approaches, and typically drops off sharply once pension age is reached. Ageing of the Australian population could then reduce economy-wide employment participation rates, with adverse consequences for economic growth. Housing has a potentially important role, though the direction of overall effects is uncertain. On the one hand, rising levels of housing wealth could accelerate early transitions out of the workforce, as the beneficiaries of capital gains feel that early retirement has become more financially viable. On the other hand, Australian home buyers are paying off larger mortgages later in life, and this could correlate with longer working lives. In addition, higher levels of housing wealth will not necessarily impact in one direction only; it can act as collateral that helps relax borrowing constraints and thereby facilitate business start-ups and self-employment initiatives.

The empirics begin with a description of employment pathways as retirement approaches, with particular reference to the contrasting paths taken by mortgagors and outright owners. The chapter then reports the findings from hazard models that are capable of identifying variables that are important as determinants of exit from the labour force. These models include housing and debt related variables, as well as a range of socio-economic and demographic controls. A concluding section discusses key findings and their policy implications.

## **3.2 Results**

Our more in-depth exploration of labour force attachments among home owners approaching retirement age uses a sample design that includes all those in HILDA waves 1 to 10 who were home owners in one or more waves, but aged between 45 and 65 years of age in 2001, as well as those who turned 45 between 2001 and 2010 (and were employed at age 45). From this group we select those who had some presence in the labour force (either employed or unemployed) over waves 1 to 10. Spells in the labour force are included, provided they began or were ongoing when the person was 45 years or older. The analysis focuses on the duration of these spells in the labour force,<sup>34</sup> and we are especially keen to identify housing-related variables that might affect attachment to the labour force in the pre-pensionable<sup>35</sup> age years.

The empirics are conducted for two subgroups separately. There is a younger cohort (45–54 years) that is in the middle years of the life cycle and would be expected to remain active in the labour force. Yet wave-on-wave (year-on-year) transitions out of the labour force average 5 per cent for this group over the study period; furthermore, 56 per cent of those exiting the labour force in any wave do not return to the labour force by the end of the study period (2010), suggesting that their change in labour force status is enduring if not permanent. The older cohort, in the age group 55–64 years, is much closer to pensionable age, a stage in the life cycle when attachments to the labour force traditionally wane. This is indeed the case, with year-on-year exits out of the labour force averaging 16 per cent in this older group. Once again, a large proportion of the older group transitioning out of the labour force are making an enduring move into what is likely to be early retirement (73% do not return to work).

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<sup>34</sup> A person may have more than one spell in the labour force—we include the most recent spell in our sample frame.

<sup>35</sup> That is, the age (65 years) when an Australian can become eligible for the Commonwealth age pension.

There are some interesting demographic and socio-economic characteristics prominent among these two groups. In the younger 45–54 years group, nearly half have outstanding mortgages, and almost all the rest are outright owners.<sup>36</sup> As this is a group of individuals who have entered middle age, the presence of a long-term health condition is common, at one in five, which likely accounts for some of their moves out of the labour force. In this middle-aged group, back in 2001 there was a sizeable minority with poor educational attainment—a little over one-third have year 11 or year 12 as their highest level of educational attainment. Two-thirds of the sample is married, but the majority (61%) have no dependent children.

It is typical for these middle-aged owners to be able to replace roughly one-third of working income if not employed. They have generally accumulated substantial amounts of both housing equity (a mean of \$370,000 at current prices) and superannuation wealth (a mean of \$260,000). The housing equity average is nevertheless depressed by the presence of mortgagors with negative equity. On a person-period basis, negative equity is present in 0.5 per cent of observations.

Those in the older group (55–64 years) who are approaching pensionable age, can fall back on an income buffer that on average replaces nearly 50 per cent of their in-work income. The incentive to work is therefore weaker among this older age group. Mortgagor status is less common in this group, with an outstanding mortgage present in only 20 per cent of person periods. On the other hand, disability is a common characteristic, afflicting almost one quarter of the sample, and the proportion with year 11 or 12 as their highest level of educational attainment is also higher, at 43 per cent. There is less gender balance in this older cohort, with males now 56 per cent of the sample. Dependent children are mostly absent (only 5% of the sample), so ‘empty nesters’ are an important feature of the demographic profile.

Average housing equity in this older age group is exactly the same as in the younger age group, despite the much smaller proportion of mortgagors in the sample. While mortgage indebtedness is less of a burden, they own housing of a lower market value (a mean of \$384,000 as compared to a mean of \$416,000 among the 45–54 years of age home owners). However, the older group have accumulated more superannuation wealth (a mean of \$280,000 as compared to \$260,000 among the 45–54 years of age home owners).

### 3.2.1 Life tables

We begin our analyses with life tables that describe the proportion of individuals that exit the labour force in any given year (1 to 9) of a spell in the labour force, *conditional on* their labour force presence in the previous wave. This measure is referred to as the hazard rate. We also report survival rates in each year of a spell—that is, the probability that a randomly selected individual will have continued presence in the labour force past year  $t$  ( $t = 1, 2, \dots, 9$ ). Table 6 is split into two panels: the first (a) presents our key measures for the younger (45–54 years) group, while the second (b) does so for the older (55–64 years) group.

The life table measures reported in Table 6 are therefore examining the strength of attachments to the labour force as the sample ages. The younger cohort (45–54 years) has reached the pre-pension age decade (55–64 years) by the end of the study time frame (2010). The older cohort (54–65 years) has gone beyond pensionable age by the end of the study time frame (2010). To explore the role of mortgage debt, we split each age cohort into two groups: those still paying off a mortgage debt in 2001 (mortgagors), and those who have transitioned into outright (‘mainstream’) ownership by 2001.

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<sup>36</sup> The proportions refer to person periods over the study time frame (2001–10). A small number of the sample falls out of home ownership and so the proportion of person periods spent as either mortgagors or outright owners sums to less than 1.

From the survival rate measures we learn that mortgagors in both age cohorts have stronger labour market ties, but especially so in the 54–65 years cohort. These mortgagors are closer to pensionable age, yet a little over one in three can expect to be continuously present in the labour force (employed or unemployed) for more than 9 years. The contrast with those who have reached outright ownership (the ‘mainstream’) is a stark one, as only one in five ‘mainstream’ owners can expect to be continuously in the labour force for more than 9 years. Survival rates among the younger cohort are much higher, as is to be expected since they are a considerable length of time away from pensionable age. Nevertheless, at year 9 the survival rate among mainstream owners is only 0.6, so a little over one in three have been lost to the labour force—ties to the labour force are much more durable among younger mortgagors, with a survival rate of 0.76 at year 9.

Attachment to the labour force is especially weak in years 7–9 of a continuous spell in the labour force. In the older cohort, hazard rates typically exceed 10 per cent for both mainstream and mortgaged owners in these years of a spell—this age group is by then in the more advanced stages of labour market careers, and so a sharply weaker attachment is unsurprising. In the younger age group, hazard rates are low and reveal little if any pattern in the earlier years of spells, before turning upwards in years 7–9 (for mortgagors)—but the upturn still leaves them below 10 per cent in nearly all years. The strength of ties to the labour force is particularly evident among younger mortgagors—their hazard rates are comfortably below 5 per cent in all years other than year 9.

These early findings suggest that housing plays an important role in shaping labour force participation decisions late in working careers. However, there are important caveats. Those paying off mortgages late in working careers might have planned to work later in life and therefore decided to carry higher levels of debt later in life. In other words, their indebtedness follows a plan to work longer, rather than the indebtedness causing longer working lives. These different preferences with respect to working lives might be correlated with measurable household characteristics; if so, more robust multivariate statistical methods could more precisely identify the nature of relationships between housing and labour force participation.<sup>37</sup> The next section reports findings from such a research approach.

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<sup>37</sup> There remains an important caveat: unmeasured personal characteristics correlated with both preferences between work, leisure and consumption as well as mortgage choices could be a source of bias in model estimates.

**Table 6: Duration of presence in the labour force for persons who were (1) outright owners; or (2) mortgagors at beginning of spell**

**(a) Aged 45–54**

Years of continuous employment (t)	Hazard rates		Survival rates	
	Outright owners	Mortgagors	Outright owners	Mortgagors
0	0	0	1	1
1	0.08	0.05	0.92	0.95
2	0.05	0.03	0.88	0.93
3	0.04	0.02	0.84	0.91
4	0.03	0.02	0.81	0.89
5	0.04	0.01	0.78	0.88
6	0.07	0.02	0.73	0.86
7	0.03	0.04	0.71	0.83
8	0.05	0.03	0.67	0.80
9	0.10	0.06	0.60	0.76

**(b) Aged 55–64**

Years of continuous employment (t)	Hazard rates		Survival rates	
	Outright owners	Mortgagors	Outright owners	Mortgagors
0	0	0	1	1
1	0.28	0.21	0.72	0.79
2	0.16	0.09	0.61	0.71
3	0.11	0.13	0.54	0.62
4	0.12	0.04	0.48	0.60
5	0.21	0.11	0.38	0.53
6	0.09	0.06	0.34	0.50
7	0.15	0.13	0.29	0.44
8	0.18	0.09	0.24	0.40
9	0.175	0.13	0.20	0.35

*Note: With individuals who have had multiple spells in the labour force over the sample time frame, we have only taken into account their final spell in the analysis.*

Source: Authors' own calculations from the 2001–10 HILDA Survey.

### 3.3 Modelling

Table 7 reports findings from a proportional hazards model that is a multivariate technique suitable for the analysis of the timing of events—in this case, end of a spell in the labour force.<sup>38</sup> The sample design is the same as that used to produce the life tables reported in the preceding

<sup>38</sup> Wood, Ong et al. (2014) use the same technique to model the duration of spells in housing affordability stress—an explanation of this modelling technique is presented in that report.

section. The model includes various socio-economic and demographic (control) variables that might shape decisions on the timing of an exit from the labour force. These variables capture the possible role played by factors such as the following.

- The presence of children in the household increases spending needs and delays retirement plans, especially among those with lower discretionary incomes.
- Married individuals have been found to earn wage premiums that could correlate with stronger ties to the labour force.
- The incentive to work (as measured by RRs) plays a role; if incomes when not working are a high proportion of income in work, attachment to the labour force will be weaker—this is more likely in lower income ranges.
- The global financial crisis was a severe shock to the economy that may have prompted many companies to introduce redundancy programs in order to become ‘leaner and fitter’ in a more competitive environment; redundancy programs often target older workers.
- Qualifications and education are an important component of human capital. Those with higher levels of human capital are typically more resilient in the face of technical change that favours the more adaptable members of the labour force. They also tend to have more interesting jobs and higher wage rates, which make continued presence in the labour force more appealing.
- Disability and health are important potential catalysts triggering moves out of the labour force. Not all dropouts from the labour force in the age categories examined (45–54 years and 55–64 years) are the product of voluntary retirement decisions that reflect financial considerations.

The proportional hazards model includes variables to capture the possible role played by these factors, as well as key variables designed to detect whether differing housing circumstances are related to transitions out of the labour force once these control variables are included.<sup>39</sup> The key housing variables are: firstly, mortgagor status (an indicator variable); and second, the amount of housing equity that the owner has stored in their primary home. Those with larger net housing wealth have a more substantial ‘buffer’ to fall back on in order to meet emergencies, especially medical emergencies, which are more likely in later life. Large amounts of housing equity should therefore facilitate early retirement intentions. Of course, the wealth stored in our homes is not the only asset that we can fall back on when leaving the labour force. The other obvious private source of financial security in retirement is superannuation, and so we also include the balances held in superannuation plans and accounts as a variable in the model specification.

We turn first to a description of our findings from the inclusion of the socio-economic and demographic controls. The results generally confirm expectations. People with disabilities are much more likely to transition out of the labour force. This is particularly evident in the 45–54 years age group, where disabled people have odds of moving out of the labour force that are roughly 2.5 times those of the ‘able-bodied’. The odds ratio falls to 1.5 in the 55–64 years age group; however, this nevertheless remains one of the more important influences shaping labour force participation decisions. Educational qualification variables confirm expectations (i.e. that those with higher education are more likely to remain in the workforce) in the younger age group, but not in the older group closer to retirement. This disparity between the age groups is also evident with respect to gender; while males’ ties to the labour force are stronger among

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<sup>39</sup> The findings reported in Table 7 should be regarded as preliminary. We do not have well-established empirical models of retirement decisions. There are a number of future directions for research that will be developed on completion of the project.

45–54 year olds (with a likelihood of leaving the labour force almost 50% that of females), this effect disappears among 55–64 year olds. The presence of dependent children deters moves out of the labour force, and in contrast to gender and disability variables, the effect is greater in the older age group.

The financial and economic variables offer a mixed picture. The incentive to work, as measured by RRs, is not statistically significant in these models. It would seem, given the findings on employment participation in the preceding analytical chapter, that the tax and benefit system effects are important in the early-to-middle segments of working lives, but in later stages other factors are more important. Interestingly, superannuation is not one of those ‘other’ important variables. Contrary to expectations, the amount of wealth accumulated in superannuation accounts does not shape the timing of moves out of retirement, even in the older group, who have passed the preservation age.

One of the important variables is clearly mortgagor status. In the younger (older) age group, the odds of a mortgagor leaving the labour force is only 19 per cent (27%) that of a mainstream owner’s odds of leaving the labour force. If an owner-occupier has an outstanding mortgage debt to pay off, their ties to the labour force are very strong. Yet higher levels of housing equity (net housing wealth) are also associated with stronger ties to the labour force; a \$10,000 increase in housing equity cuts the odds of leaving the labour force by 1.3 per cent (0.9%) relative to the 45–54 years old (55–64 years old) owner-occupier with \$10,000 less in housing equity.<sup>40</sup> This is puzzling. It implies that an outright owner with no mortgage debt obligations is, predictably, more likely to leave the workforce (all else being equal); *however*, the effect is muted among those in the mainstream with *higher* amounts of housing equity. Furthermore, a mortgagor has much stronger ties to the labour force (all else being equal) and those ties are more durable among mortgagors who have *higher* levels of housing equity.

The interrelationship between housing equity and mortgagor status could be due to a collateral effect; housing wealth is more fungible due to the emergence of innovative mortgage products. Mortgagors who have been made redundant, or wish to change direction in their work careers, could be dipping into their housing wealth in order to release funds that can be used to finance business ventures and self-employment initiatives. This is, of course, more practical the higher the housing equity that can be drawn down. However, on adding an interaction variable that is the product of the mortgagor indicator variable and housing equity (while retaining all other variables in the model specification), the interaction effect is found to have a positive influence on transitions out of the labour force (that is statistically significant in the older age group). This runs counter to the collateral hypothesis. On the other hand, the housing equity variable on its own continues to detect a negative influence on moves out of the labour force—and in the presence of our interaction variable, this represents the effect of housing equity on the labour force participation decisions of mainstream owners. These are early findings on a topic of great importance, given ageing of the population, and they warrant further investigation.

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<sup>40</sup> The effect is only weakly statistically significant in the older age group.

**Table 7: Hazard model estimates of probability of exiting the labour force for persons aged 45–54 and 55–64 years—odds ratios**

<b>Variables<sup>41</sup></b>	<b>Aged 45–54</b>	<b>Aged 55–64</b>
RR	0.995 (-0.00358)	0.995 (-0.00378)
Mortgagor	0.192*** (-0.0364)	0.273*** (-0.0792)
Disability	2.589*** (-0.473)	1.494** (-0.262)
Male	0.516*** (-0.0884)	0.779 (-0.138)
Housing equity (\$0,000s)	0.987** (-0.00542)	0.991* (-0.00562)
Superannuation wealth (\$0,000s)	1.001 (-0.00358)	1.001 (-0.00274)
Married, no kids	0.733* (-0.13)	0.192*** (-0.056)
Single, kids	0.484 (-0.243)	0.675 (-0.445)
Single, no kids	0.598** (-0.134)	0.129*** (-0.0436)
Certificate	0.468*** (-0.107)	0.702 (-0.174)
Diploma	0.330*** (-0.113)	0.718 (-0.221)
University	0.334*** (-0.0839)	0.699 (-0.194)
Year 12	0.494** (-0.143)	0.641 (-0.204)
Observations	3,218	1,263

*Notes: Robust standard errors in parentheses. Standard errors are clustered by *xwaveid*: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Sample is confined to persons who were home owners at beginning of labour force spell (*t1*). Constant term is suppressed from hazard models. Model also includes time indicators and Major City indicators that are suppressed for space considerations.<sup>42</sup> Reference categories are: outright owners, married with kids, year 11 and Sydney.*

Source: Authors' own calculations from the 2001–10 HILDA Survey.

<sup>41</sup> See Appendix 1 for a list of variable names and their corresponding definitions.

<sup>42</sup> Complete results tables are available from the authors upon request.

### **3.4 Policy development implications of empirical findings**

This chapter examines those approaching retirement, so as to explore the factors that might be driving early retirement, or alternatively promoting longer working lives. In an ageing society with increasing age dependency ratios this is a critical issue. If the changing personal characteristics of those approaching retirement favours longer working lives, we can be more sanguine about the consequences of an ageing population in terms of productivity, economic growth and government fiscal positions. Housing has a potentially important role to play. This is because it can, as we have seen in Chapter 2, affect the incentive to work through the income buffer it provides, which people can fall back on to replace their in-work earnings. However, it is also relevant because mortgages are being paid off later in life—and as we found in Chapter 2, this is associated with stronger work ties. Moreover, owner-occupiers' employment ties could benefit from a collateral effect that allows them to tap their housing equity to finance self-employment initiatives; a factor that might be more important in later working lives when accumulated housing equity has reached higher levels.

The empirical findings suggest that financial incentives to work are unimportant; this could be because work satisfaction is a more relevant consideration in the later stages of work careers. This implies that reforms to tax and benefit programs (including housing assistance) that are designed to sharpen the incentive to work for the elderly are unlikely to be effective. On the other hand, we find that mortgagor status is strongly correlated with enduring participation in the labour force, even as pension age approaches. Whatever the direction of causation between debt and working lives, this is a significant finding, because it confirms the importance of the mortgagor link at later stages of work careers. The trend towards later repayment of outstanding mortgage balances will correlate with an increase in labour force participation rates among older workers, and help offset the productivity consequences of an ageing workforce. However, as we cautioned in Chapter 2, older indebted workers are exposed to hazards that can adversely impact wellbeing, and there are economy-wide implications that could warrant concern.



## 4 Intergenerational transfers, employment and earnings

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Housing assets are the largest component of most households' wealth portfolio and are typically more liquid than superannuation balances. Housing is therefore an important source of intergenerational wealth transfers. We estimate that in any one year, 5.9 per cent of Australians benefit from a parental cash transfer and roughly 1.4 per cent receive bequests. The research reported in this chapter is motivated by the idea that beneficiaries might make different choices with respect to their education and work careers, because they can afford to take more risks and the cash sums received could help relax borrowing constraints.

We match a sample of Australians who have received an intergenerational transfer with a matched sample of Australians who were not recipients (despite being equally likely to have been a beneficiary). Our key findings are:

- beneficiaries consequently have larger bank balances and higher investment incomes to bridge unexpected shocks
- beneficiaries are also more likely to have been awarded a bachelor's degree and to have engaged in some form of self-employment.

The circulation of housing wealth between generations is thus helping to shape the economic opportunities of younger generations. The business start-ups that intergenerational transfers seem to promote may have significant economic spin-offs for productivity and economic growth. On the other hand, the children of 'lifetime' renters are bypassed by these wealth circuits, with the danger being that wealth inequalities become more entrenched.

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### 4.1 Introduction

The role of intergenerational transfers has attracted increasing attention as home owning baby boomers have reaped large capital gains, which can be unlocked using flexible mortgage products. Since housing is the largest component of most households' wealth portfolio and is more liquid than superannuation balances (before preservation age; 55 years), the steep increase in house prices since the mid-1990s provides baby boomer parents with growing opportunities to give their children 'a helping hand'. It would seem that baby boomer parents are doing just that (see Table 9). There is also convincing evidence (see Barrett, Cigdem et al. 2015b) that intergenerational transfers are helping younger age cohorts into home ownership, and so housing wealth is beginning to circulate within families. There could also be labour market connections, as parents meet some or all of the schooling and higher education costs of their children by unlocking some of the wealth tied up in their homes. Behavioural adaptations are also possible if beneficiaries take more risks by (for example) starting new businesses in anticipation of bequests, or with the assistance of cash transfers from family donors. We might also witness lower work effort if instead of motivating risk-taking business ventures and assisting with education, beneficiaries work and study less in the knowledge that living standards will be cushioned by their parents' largesse. These connections have potentially significant implications for productivity and growth, and motivate this chapter of the report.

We explore these ideas using a propensity score methodology that first identifies (using HILDA) those receiving a bequest or cash transfer from parents between 2001 and 2010. Instead of simply comparing outcome measures across beneficiary and non-beneficiary groups, the method matches each beneficiary to a control who was not a recipient but was equally likely to receive an intergenerational transfer (given their personal characteristics such as age, number of siblings and so on). The approach tries to mimic randomised clinical trials where patients that share the same ailment are randomly assigned into two groups, a treatment group that receives medication and a control group that is given a placebo (see Wood and Cigdem 2012).

Barrett, Cigdem et al. (2015b) used the propensity score methodology to assign HILDA Survey respondents into a treatment group (those receiving cash transfers and bequests) and a matched control group. Their study investigated whether beneficiaries entered home ownership earlier and bought housing of higher value using larger deposits. These treatment and control designs are equally useful for the investigation of possible behavioural effects in labour markets and we use them in this section for that purpose.<sup>43</sup>

## 4.2 Results

### 4.2.1 Descriptive statistics

The number of individuals in the HILDA sample who report receiving bequests or monetary gifts, and the value of those bequests or gifts, are reported in Table 8, along with the mean value of transfers in each year from 2002–12. Many more Australians receive a cash transfer (roughly four times more) than an inheritance

Over the course of 2002–12, approximately 1.8 million Australians inherited money on one or more occasions.<sup>44</sup> At current prices, the average amount of each inheritance (conditional on being a beneficiary) was \$79,000, but the distribution is strongly skewed because the median is much lower at \$25,000. On a per-person basis, the average cumulative value of inheritances is \$95,000.

A considerably larger fraction (5.9%) of the Australian population typically benefit from a parental cash transfer over the course of a year. Over the decade 2002–12, a large number of Australians (5.8 million) received one or more cash transfers, but the average amount of any one cash transfer (\$4,600) is much smaller than the typical size of inheritances—and again the distribution is skewed, since the median is \$1,000. Over the decade, 2.7 million Australians were the recipients of multiple cash transfers, and of those beneficiaries, the average they received was three transfers. On a per-person basis, the average cumulative value of cash transfers over the period 2002–12 is thus higher at \$9,000 and the median is also higher at \$2,000.

Columns 1 and 2 of Table 9 (below) compare the personal characteristics of heirs (recipients of an inheritance or bequest) and non-heirs, using data from the HILDA Survey; columns 3 and 4 compare beneficiaries of parental cash transfer with non-beneficiaries. Those receiving bequests are on average somewhat older (48.1 years) than non-bequest recipients (44.0 years). Increasing longevity in the broader population means that parents are bequeathing when their children are in middle age, rather than in their early adulthood, as was more likely to be the case during much of the twentieth century. On the other hand, recipients of transfers are significantly younger (37.0 years) than heirs, as well as their counterparts who do not receive

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<sup>43</sup> See Barrett, Cigdem et al. (2015b) and the earlier Wood and Cigdem (2012) for a more complete description of the propensity score technique.

<sup>44</sup> Population estimates here and elsewhere in this chapter are determined using HILDA's population weights.

gifts/transfers (45.8 years). These age comparisons help us to interpret other divergent socio-economic characteristics as reflecting life-cycle considerations. Thus married people make up a smaller proportion of beneficiaries, and those receiving cash transfers from parents are less likely to report being home owners.

Recipients of both bequests and cash transfers have fewer siblings, and females are more likely to have beneficiary status. Country of origin seems to have no bearing on the pattern of intergenerational transfers, but those with higher levels of educational attainment are over-represented in the beneficiary groups. Household disposable income is somewhat higher in households receiving these windfall gains.

**Table 8: Receipt of parental cash transfer or an inheritance/bequest (current prices)**

Wave <sup>45</sup>	Inheritance/bequest			Parental cash transfer		
	Mean (\$)	Obs.	%	Mean (\$)	Obs.	%
2002	62,866	182	1.4	3,970	582	4.6
2003	66,548	191	1.5	4,608	666	5.5
2004	59,831	176	1.5	3,472	701	5.8
2005	74,655	172	1.4	3,165	760	6.1
2006	115,834	167	1.3	3,292	707	5.8
2007	65,723	173	1.4	4,651	676	5.5
2008	86,904	157	1.2	4,360	753	6.1
2009	65,262	176	1.4	3,567	703	5.5
2010	77,451	191	1.5	4,457	858	6.6
2011	83,743	215	1.3	7,018	1,078	6.5
2012	104,043	264	1.5	5,819	1,081	6.5
Total	79,280	2,064	1.4	4,572	8,565	5.9

*Notes: The sample is a pooled, unbalanced longitudinal sample drawn from the Responding Persons HILDA files, comprising a total of 147,822 person-year observations. Counts include only those persons who provided an answer to questions regarding the amount of bequest or parental transfer received.*

Source: Barrett, Cigdem et al. (2015a: Table 1).

<sup>45</sup> Note that the sample time frame in this table is longer than the time frame used in the descriptive tables and propensity score analysis (2002–12 versus 2002–10). The reason for the shorter time frame in the subsequent analysis is that the 2010 HILDA data offers wealth modules that are not available in waves 11 or 12; we utilise this wealth information to compare the wealth positions of transfer recipients and non-recipients.

**Table 9: Characteristics of transfer recipients and non-recipients**

	Inheritance/bequest		Parental cash transfer	
	Recipients	Non-recipients	Recipients	Non-recipients
<i>Tenure</i>				
Owner (with or w/out mortgage) (%)	80.4	69.3	61.8	71.8
Renter (%)	19.6	30.7	38.2	28.2
<i>Personal characteristics</i>				
Male (%)	43.5	48.1	42.9	48.3
Age (years)	48	44	37	45
Number of children (no.)	0.702	0.894	0.835	0.88
Number of siblings (no.)	2.599	2.832	2.212	2.898
Born in an English speaking country (%)	11.9	9.0	8.6	9.4
Born in non-English speaking country (%)	83.3	13.4	9.5	13.0
Born in Australia (%)	75.6	77.6	82.0	77.6
Married/partnered (%)	43.5	73.7	69.1	74.6
<i>Household structure</i>				
Couple, no children (%)	34.6	28.2	27.5	29.1
Couple with dependents/child (%)	36.2	40.2	40.1	39.8
Couple with non-dependent child (%)	5.1	6.9	5.6	6.9
Lone parent with dependents/child (%)	3.6	6.0	4.7	5.9
Lone parent with non-dependent child (%)	3.3	3.0	1.8	3.3
Lone person (%)	15.8	12.9	17.3	12.6
Other household type (%)	1.3	2.6	3.1	2.4
<i>Socio-economic characteristics</i>				
Household disposable income (\$)	94,594	91,080	92,230	91,326
Employed full-time (%)	52.0	56.0	58.1	55.2
Employed part-time (%)	24.6	20.6	24.4	20.5
Not in labour force (NILF)	20.9	20.1	14.1	21.1
<i>Education</i>				
Postgraduate	6.2	5.0	6.4	4.9
Graduate certificate/diploma	7.8	6.8	8.6	6.7
Bachelor's	18.0	16.3	28.5	14.7
Diploma	11.6	9.9	10.7	10.1
Certificate	21.7	24.2	17.1	25.0
Year 12	11.9	12.4	15.3	11.9
Year 11	22.7	25.4	13.5	26.8

	Inheritance/bequest		Parental cash transfer	
	Recipients	Non-recipients	Recipients	Non-recipients
<i>Location</i>				
Victoria	25.1	24.8	31.0	23.9
Queensland	22.2	21.5	19.7	21.9
South Australia	9.6	0.09	0.085	0.092
Western Australia	7.6	0.092	0.075	0.093
Tasmania	2.9	0.03	0.027	0.031
Northern Territory	0.8	0.9	0.8	0.9
Australian Capital Territory	3.3	2.1	3.4	2.1
New South Wales	28.6	29.4	26.4	29.7
Agg. bequest/gift, W1–W10 (\$)	84,557	NA	13,765	NA
Observations	898	7,774	1,131	7,541

*Notes* : Sample drawn from wave 10 of HILDA. The figures for the value of transfers received (bequests and inter vivos transfers) reflect the total amount received by recipients over the first 10 waves of HILDA.

Source: Barrett, Cigdem et al. (2015a: Table 2).

#### 4.2.2 Propensity score matching results

Comparison of labour market outcome measures by recipient status risks confounding the possible effects of intergenerational transfers with other variables correlated with recipient status. For example, we know from Table 9 that a higher proportion of heirs are female, and gender discrimination is widely believed to influence labour market outcomes among women. To avoid attributing gender-based differences in outcomes to intergenerational transfers, or those gender-based differences masking differential outcomes that are in fact due to intergenerational transfers, Table 10 presents propensity score matching results comparing beneficiaries with paired non-recipients. As explained in the introduction, the technique matches each recipient of a inheritance/bequest or cash transfer (from parents), with a ‘control’ who is equally likely to receive a bequest or cash transfer (as determined by personal characteristics such as number of siblings, gender and so on).

Table 10 (bequests) and Table 11 (cash transfers) present the findings with respect to a range of labour market and human capital outcome measures that were not used in the matching process; we list the mean values of these variables among the treated (beneficiaries) and the matched controls, as well as the statistical significance of the differences between mean values (t-test).

Recipients of both bequests and parental cash transfers have lower earnings than non-recipients, and are more likely to have withdrawn from the labour force despite having better qualifications. However, these differences are only statistically significant for cash transfer beneficiaries, and in respect of qualifications (not earnings). For example, 29 per cent (18%) of cash transfer (bequest) beneficiaries have a bachelor’s degree, while only 21 per cent (15%) of the matched controls have a bachelor’s degree. The inferior earnings of recipients of cash transfers are likely due to their lower average hours of work (37 hours versus 39 hours) and weaker attachment to the labour force—though only the difference in hours worked is statistically significant. There are big differences in the bank balances and net investment incomes of heirs as compared to their matched controls. At an average \$26,000, their bank balances are more than double those of the matched controls; and an annual average of \$4,200

net investment income is over one-third greater than the \$3,100 accrued by the matched controls.<sup>46</sup>

Beneficiaries do, therefore, have superior income buffers to fall back on to meet acute spending needs in emergencies, or to bridge unexpected income shocks. These intergenerational transfers can therefore offer insurance protection that can promote risk-taking in employment activities. It is here that we uncover strong evidence confirming our hypotheses: 22 per cent (17%) of those receiving an inheritance (cash transfer) are self-employed, but 16 per cent (11%) of the matched controls are self-employed. These differences are statistically significant. When combined with compelling evidence that transfers also promote home ownership (see Barrett, Cigdem et al. 2015a, 2015b), we unveil a picture in which the intergenerational circulation of housing wealth is a prominent feature helping to fuel asset accumulation among the offspring of Australian home owners. The evidence also suggests that intergenerational transfers promote the birth of small businesses and self-employment. We might expect this to have positive effects on economic growth, as the transfers help relax borrowing constraints that can stifle the formation of new enterprises. On the other hand, this circulation of housing wealth will bypass the children of parents who rent or have accumulated little in the way of housing wealth. It is important to investigate these linkages in further research.

**Table 10: Impact of bequests on human capital and labour supply**

Outcome (2010)		Treated	Controls	Diff.	T-stat
Wages and earnings	Mean wages and earnings per week (all jobs) (\$)	1,001.1	1,047.9	-46.9	-0.81
	Mean wages and earnings per week (main job) (\$)	990.6	1025.8	-35.3	-0.59
Highest qualification attained	% with postgraduate degree (master's or PhD)	6.3	5.9	0.4	0.33
	% with graduate diploma/certificate	8.5	7.8	0.7	0.48
	% with bachelor's with(out) honours	18.0	15.4	0.6	1.24
	% with (advanced) diploma	12.2	11.1	1.1	0.56
	% with certificate III or IV	22.3	23.2	-0.9	-0.37
	% with year 12	10.3	10.7	-0.4	-0.25
	% with year 11	22.4	26.0	-3.6	-1.42
Labour force, broad	% in labour force	78.3	80.5	-2.2	-0.96
	% not in labour force (NILF)	21.7	19.5	2.2	0.96
Labour force, detailed	% employed full-time	51.3	54.1	-2.8	-0.97
	% employed part-time	24.3	23.2	1.2	0.48
	% unemployed, looking for full-time work	1.3	2.8	-1.5	-1.82
	% unemployed, looking for part-time work	1.2	0.4	0.8	1.44
	% NILF, marginally attached	3.5	4.0	0.5	-0.4
	% NILF, not marginally attached	18.2	15.5	2.6	1.25

<sup>46</sup> However, the difference in investment income is not statistically significant.

Outcome (2010)		Treated	Controls	Diff.	T-stat
Occupation	<i>% machine operators/drivers and labourers</i>	10.3	14.7	-4.4	-2.08
	<i>% managers and professionals</i>	44.1	45.1	-1.0	-0.30
Hours worked	Hours usually worked in all jobs (per week)	37.672	37.638	.035	0.04
Bank deposits and investments	<i>Bank account balance (\$)</i>	25,721	12,093	13,628	3.40
	<i>Net investment income^ (\$)</i>	4,228	3,142	1,086	1.08
Employment and contract status	<i>% self-employed/employee of own business</i>	21.5	16.1	5.4	2.13
	<i>% employed as casual</i>	11.4	14.9	-3.5	-1.41
	<i>% employed as permanent</i>	76.7	75.2	1.5	0.48

Notes: Variables with statistically significant different values are in italics. Sample is confined to persons aged 25–65 in any one wave between years 2001–10. Treatment recipients (beneficiaries) are matched with the control sample on their mean pre-treatment characteristics.<sup>47</sup> Probit regression model estimates used to estimate the propensity scores, as well as the post-estimation diagnostic tests to verify match quality, are available from the authors upon request. There are 682 persons (9.3% of sample) who received a bequest at least once between waves 2002 and 2010<sup>48</sup>; the mean and median total amount of bequest/inheritance received over the sample time frame was \$82,444 and \$29,000, respectively. ^Investment income is calculated as the sum of interest, dividends, royalties and rental income net of expenses. For persons who report negative financial year investment income, their negative amounts are subtracted to arrive at a net investment figure.

Source: Authors' own calculations, from the 2001–10 HILDA Survey.

<sup>47</sup> For individuals who received a bequest or inheritance in more than one wave during the sample time frame, we use as our reference year the earliest year that the individual received a bequest/transfer to calculate their mean pre-treatment characteristics.

<sup>48</sup> Bequest and transfer information collected in wave 1 of HILDA is excluded from the sample as a result of unreliable survey data collected in this wave.

**Table 11: Impact of parental transfers on human capital and labour supply**

	Outcome (2010)	Treated	Matched controls	Diff.	T-stat
Wages and earnings	Mean wages and earnings per week (all jobs) (\$)	963.1	1024.3	-61.2	-1.25
	Mean wages and earnings per week (main job) (\$)	938.3	1002.3	-64.0	-1.33
Highest qualification attained	% with postgraduate degree (master's or PhD)	6.5	4.9	1.6	1.21
	% with graduate diploma/certificate	8.8	8.0	0.8	0.51
	% with bachelor's with(out) honours	28.6	20.9	7.6	3.21
	% with (advanced) diploma	11.9	10.9	1.0	0.57
	% with certificate III or IV	17.7	24.1	-6.4	-2.69
	% with year 12	13.5	12.6	0.9	0.48
	% with year 11	13.0	18.6	-5.7	-2.61
Labour force, broad	% in labour force	87.3	89.6	-2.3	-1.23
	% not in labour force (NILF)	12.7	10.4	2.3	1.23
Labour force, detailed	% employed full-time	57.9	61.7	-3.8	-1.35
	% employed part-time	25.9	24.4	1.5	0.6
	% unemployed, looking for full-time work	2.8	2.2	0.6	0.66
	% unemployed, looking for part-time work	0.7	0.9	-0.2	-0.42
	% NILF, marginally attached	3.8	3.7	0.1	0.1
	% NILF, not marginally attached	8.9	6.7	2.2	1.4
Occupation	% machine operators/drivers and labourers	7.6	10.0	-2.4	-1.31
	% managers and professionals	51.2	45.6	5.5	1.82
Hours worked	<i>Hours usually worked in all jobs (per week)</i>	37.1	39.4	-2.4	-2.85
Bank deposits and investments	Bank account balances (\$)	10,131	12,563	-2,431	-0.77
	Net investment income^ (\$)	1,273	1,584	-311	-0.38
Employment and contract status	% self-employed/employee of own business	17.1	11.2	5.9	2.77
	% employed as casual	15.7	14.9	0.8	0.35
	% employed as permanent	72.5	74.2	-1.7	-0.57

Notes: See notes Table 10. There are 874 persons (12% of sample) who received a parental gift/transfer at least once between waves 2002 and 2010; the mean and median total amount of parental gift/transfer received over the sample time frame was \$13,266 and \$3,000, respectively.

Source: Authors' own calculations, from the 2001–10 HILDA Survey.

### 4.3 Policy development implications of empirical findings

Housing assets are typically the most important component of households' wealth portfolio. With the emergence of flexible mortgage products, along with strong capital growth over the last 20 years, home owning parents have more opportunities to help their children through



intergenerational transfers. To measure possible effects on labour supply and human capital, we use a research method that mimics clinical trials. Every person who has received an inheritance (or cash transfer from parents) is matched to a control who has not been a beneficiary, but is judged to be similarly likely to have received one given their personal characteristics. We find that recipients of both bequests and parental cash transfers have lower earnings and are more likely to have withdrawn from the labour force despite better qualifications. On the other hand, beneficiaries are significantly more likely to be self-employed, suggesting that intergenerational transfers could be stimulating business start-ups; we find that 22 per cent (17%) of those receiving an inheritance (cash transfer) are self-employed, while only 16 per cent (11%) of the matched controls are self-employed. These links between intergenerational transfers and self-employment could be the result of borrowing constraints that are relaxed by transfers; or the role of transfers as an income buffer that promotes risk-taking. Regardless of the causal link, our evidence hints at an intergenerational circulation of housing wealth that helps recipients establish business ventures that might not otherwise 'get off the ground'. Further research is needed to establish the significance of these economic spin-offs.

Offsetting the above positives are negative implications for equality (see also Barrett, Cigdem et al. 2015b). The evidence shows that children from affluent socio-economic backgrounds are more likely to receive intergenerational transfers than those from a disadvantaged background. Moreover, our findings suggest that beneficiaries are more likely to obtain a university qualification. Intergenerational wealth transfers may help entrench and even exacerbate inequality in lifetime economic opportunities. If intergenerational transfers become an increasingly important pillar supporting educational, housing and employment opportunities, policy-makers will need to heed the consequences for those children of less well-off parents who are bypassed by the intergenerational circulation of wealth.

## 5 Policy development options

Recent policy initiatives that aim to raise employment participation are varied, but typically fall into three types. The first focuses on delaying eligibility for non-work sources of retirement income, including the age pension and superannuation pay-outs. The second aims to incentivise workforce participation by lowering the tax on income earned through tax offsets. The third is a general tightening of eligibility criteria for income support payment access. Reforms to housing assistance programs have played a negligible role in policy-making around the issue of incentives to work.

Furthermore, none of the above initiatives address the fact that the majority of older Australians have typically accumulated large reserves of housing wealth, encouraged by tax and means test concessions that offer preferential treatment of the family home. They can increasingly draw down on this housing wealth without undergoing a costly application process, as a result of financial innovations that have turned housing wealth into an 'ATM' that borrowers can draw from as and when they choose (Ong, Jefferson et al. 2013; Smith and Searle 2010). This growing fungibility of housing wealth will likely play a role in influencing workers' decisions to either continue in or withdraw from the labour force as pensionable age approaches.

The housing wealth of older Australians is also likely to affect the education and work career paths of their adult children. This is because parents may dip into (or bequeath) their housing wealth in order to assist their children. Those anticipating transfers from their parents may factor this expectation into their education and employment decisions. We know little about how this intergenerational circulation of housing wealth is impacting young adults' working careers and education outcomes. It is important to empirically explore these ideas and establish whether intergenerational transfers are a source of dynamism and innovation (e.g. business start-ups); or, alternatively, contributing to a growing wealth inequality whereby the children of parents who lack large amounts of wealth fail to meet their educational and employment potential.

Yet another housing-related development with potentially important implications for labour markets and hence productivity is that growing numbers of Australian households are taking on higher levels of mortgage debt (relative to household incomes), and paying down their mortgages later in life (Wood, Ong et al. 2014). One interpretation of this phenomenon argues that increasing longevity has encouraged many Australians to plan longer working lives; carrying higher levels of mortgage debt later in the life cycle is therefore a financially prudent way of smoothing consumption over the life cycle. On the other hand, there is an argument that soaring real house prices have not been anticipated, and as a consequence home buyers borrowed more in order to climb the 'housing ladder'. This is a source of 'mortgage stress', which is prompting mortgagors to work harder and extend their working lives. Both perspectives predict longer working lives; if this prediction is confirmed by the evidence, it would assuage fears about a productivity slowdown due to population ageing related drops in employment participation rates.

The research findings are particularly timely given an accelerating rate of population ageing in Australia. Population ageing has prompted fears of an enduring economic slowdown, because participation rates fall as pensionable age approaches and then decline sharply beyond that age. Holding all else constant, an ageing population will lead to a decline in productivity and lower GDP per capita, if policy reforms are not put in place to encourage the extension of working lives among ageing Australians and to promote workforce participation among those from disadvantaged backgrounds.

## 5.1 Summary of key research questions and answers

*Do different government transfer programs, and especially housing assistance, blunt incentive to work and depress employment participation rates?*

There are two main housing assistance programs: CRA and public housing. Our modelling suggests that CRA has a negligible influence on the future employment outcomes of those already employed. This is because the overwhelming majority of working people continue in employment year on year. However, even among unemployed adults receiving Newstart or Youth allowance, CRA has little influence on the chances of a successful transition back into employment. One important reason is a judicious CRA design feature that restricts eligibility to those in receipt of an income support payment, but only withdraws CRA once eligibility to the underlying income support payment is lost. Thus, Newstart (or Youth) allowance and CRA are never simultaneously withdrawn. This is especially important for lower-wage workers or part-timers who can invariably retain at least some, if not most CRA, on a return to work.

Public housing tenants have very low employment participation rates, which some commentators have argued is due to welfare dependence. Our modelling results suggest that even though the typical public housing tenant can replace a relatively high fraction of in-work income when not in work, these blunt work incentives are not the main cause of their low rate of participation. Public housing tenants are a severely disadvantaged group who face multiple barriers to employment. As indicated in the case study reported in Chapter 2 (see Section 2.3), reforms that strengthen financial incentives to work will have only small effects on employment rates. An integrated approach that addresses barriers to employment for those in public housing (e.g. drug and alcohol abuse, mental health problems, skill deficiencies and so on) is likely to be a more effective approach to improving the employment outcomes of public housing tenants.

*Home buyers are taking on larger mortgages (relative to household incomes) and repaying outstanding mortgage debt later in life. Is this going to delay age-related declines in rates of employment?*

While housing-related work incentive effects on labour supply appear to be unimportant, the same cannot be claimed in relation to mortgage debt and its influence on the length of 'working lives'. Our empirical analysis, as well as earlier AHURI research reported in Atalay, Barrett et al. (2016), confirms that higher mortgage indebtedness is linked with stronger labour market ties. Growing indebtedness among Australian home owners approaching retirement appears to be associated with longer working lives. These higher levels of mortgage debt may be in part the product of unexpectedly high real house prices, which prompted home buyers to take on high levels of debt in order to finance their preferred housing choices. An alternative explanation is that Australians now expect to live longer lives, so plan to work beyond pensionable age and are therefore comfortable with decisions to pay off mortgages later in life. Whatever the explanation, the result is the same: longer working lives and a more gradual decline in rates of labour force participation as Australians age. This will help the Australian economy mitigate productivity slowdown due to population ageing.

There is another important policy implication. There have been fears that growing indebtedness among Australians in midlife reflects a deliberate plan to 'de facto' access superannuation balances before reaching preservation age. In other words, heavily indebted Australian home owners are approaching retirement in the knowledge that their superannuation balances can be used to pay down their mortgages. This would, of course, undermine an important goal of retirement incomes policy—that is, alleviating pressure on government age pensions. The evidence that we present here offers some comfort to policy-makers. It seems that those carrying mortgage debt as they approach retirement age have much stronger employment ties and are working longer than their outright-owner counterparts. These longer working lives imply

accumulation of larger superannuation balances, as well as a later drawdown of those balances.

While policy-makers might welcome these labour market consequences, there is a downside. Previous research has also shown that repayment risk in mid-to-late life is highly correlated with adverse life events such as marital breakdown and unemployment (Ong, Jefferson et al. 2013b). Moreover, Cigdem et al. (forthcoming) find that mortgagors with debt stress have lower levels of wellbeing (in both Australia and the United Kingdom). Carrying higher levels of mortgage debt later in life could thus have negative consequences for wellbeing in later years. Finally, while higher debt might be taken on in anticipation of longer working lives, unexpected life events (e.g. ill health) can seriously disrupt such plans. In that eventuality, it is possible that lump sum superannuation pay-outs will be used to pay down mortgage debt.

*Housing remains the most important component of most households' wealth portfolio. Intergenerational transfers are an important feature of contemporary family life and housing wealth will be an important direct or indirect funding source for these transfers. Are these transfers helping to shape the education and employment outcomes of beneficiaries?*

To estimate the effects of intergenerational transfers on education and employment outcome we use a research method that mimics clinical trials. Every person that has received an inheritance or cash transfer from their parents is matched to a control who has not been a beneficiary, but is judged to be similarly likely to have received one given their personal characteristics.

There are three key findings:

- 1 Beneficiaries have better educational qualifications and in particular are more likely to hold a bachelor's degree.
- 2 Beneficiaries' average bank deposit account balances are more than double those of our control group, and average net investment income is roughly one-third higher.
- 3 The proportion of beneficiaries in the labour force is roughly the same as for non-beneficiaries, but a significantly higher proportion are self-employed.

The recipients of transfers therefore have more financial assets that can act as a buffer to meet income shocks, and collateral to relax borrowing constraints. In view of these differences, beneficiaries might take more risks, and are in a better position to borrow, whether to take advantage of educational opportunities or to finance business start-ups. The evidence confirms expectations about education and business start-ups, but whether this is because beneficiaries are less risk averse or better able to relax borrowing constraints awaits further research. It would therefore seem that the intergenerational circulation of housing wealth helps recipients achieve their educational goals, as well as establish business ventures that might not otherwise 'get off the ground'. These findings add to a growing body of literature that is showing how housing wealth plays an important role as a source of asset-based welfare (Doling and Ronald 2010; Doling and Elsinga 2013).

Offsetting the above positives are negative implications for equality (see also Barrett, Cigdem et al. 2015b). The evidence shows that children from affluent socio-economic backgrounds are more likely to receive intergenerational transfers than those from a disadvantaged background. Intergenerational wealth transfers may help entrench and even exacerbate inequality in lifetime economic opportunities. If intergenerational transfers become increasingly important as a pillar supporting educational, housing and business start-up opportunities, policy-makers will need to heed the consequences for those children of less well-off parents who are bypassed by the intergenerational circulation of housing wealth.

## 5.2 Final remarks

There are a number of channels through which housing can influence employment outcomes. Government housing assistance can blunt incentive to work and deter employment participation among clients of these programs. However, we find that these effects are modest.

Housing can also impact home owners' employment decisions, because large amounts of wealth are accumulated in housing; this wealth might prove helpful in launching self-employment initiatives, but could also ease transitions into early retirement. There is mixed evidence here and we need further research in order to pin down these possible linkages.

We are on firmer ground when examining the idea that indebted mortgagors are delaying their retirement by working longer. This could help maintain rates of employment despite an ageing population. There is firm evidence of such an effect, but carrying debt later in life exposes older people to risks that are costly to hedge. There is a complex array of considerations here that policy-makers might wish to carefully weigh up.

The circulation of housing wealth across generations has received little attention from researchers. However, it will have a potentially important influence on the educational opportunities and work career paths of generations X and Y. The evidence presented in this report suggests that the beneficiaries of transfers are better educated and more likely to be self-employed. These wealth transfers could well have positive effects on productivity, but by the same token, those bypassed by the intergenerational circulation of housing wealth could fall further behind and consequently under-achieve over their working lives. Research into these intergenerational channels is at an early stage of development. The baby boomer generation of home owners have accumulated very large amounts of housing wealth. How they choose to pass this on to their children, and how it is subsequently used, could prove to have an increasingly important influence on the welfare of generations X and Y. This is an important future research direction.

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## Appendix 1: List of variable names and definitions used in multinomial models (reported in Chapter 2) and hazard models (reported in Chapter 3)

Explanatory variables	Definition	Binary or continuous
Time indicators	Beginning of spell in labour force (reference)	Binary
	First year of spell	
	Second year of spell	
	Third year of spell	
	Fourth year of spell	
	Fifth year of spell	
	Sixth year of spell	
	Seventh year of spell	
	Eighth year of spell	
Ninth year of spell		
Gender	Female (reference)	Binary
	Male	
Age bands	Aged < 45 (reference)	Binary
	Aged 45–54 years	
	Aged 55–64 years	
	Aged 65 years or over	
Family type	Married, kids (reference)	Binary
	Married, no kids	
	Single, kids	
	Single, no kids	
Real equivalised gross household income (\$0,000s)	Amount of equivalised gross household income, in thousands of dollars in 2010 prices	Continuous
Self-assessed health	Long-term health condition, disability or impairment	Binary
Highest educational qualification	Bachelor's degree or higher	Binary
	Advanced diploma/diploma	
	Certificate	
	Year 12	
	Year 11 (reference)	
Replacement rate (RR)	Measure of incentive to work	Continuous
Labour force	In labour force	Binary
	Not in labour force (reference)	
Superannuation wealth	Estimate of superannuation wealth, in tens of thousands of dollars	Continues

<b>Explanatory variables</b>	<b>Definition</b>	<b>Binary or continuous</b>
Primary home debt	Total amount owing on primary home, in hundreds of thousands of dollars	Continuous
Home value	Approximate value of home today, in hundreds of thousands of dollars	Continuous
Housing equity	Estimate of housing equity, in tens of thousands of dollars	Continuous
Home ownership status	Outright owner (reference) Mortgagor	Binary
Location	Sydney (reference) Balance of New South Wales Melbourne Balance of Victoria Brisbane Balance of Queensland Adelaide Balance of South Australia Perth Balance of Western Australia Tasmania Northern Territory Australian Capital Territory	Binary

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