Final Report

The relationship between intergenerational transfers, housing and economic outcomes

authored by

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ACRONYMS

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Limited
AIHW	Australian institute Housing and Welfare
DFL	DiNardo, Fortin and Lemieux (1996)
FHOG	First Home Owners Grant
GFC	Global Financial Crisis
HILDA	Household, Income and Labour Dynamics in Australia
OLG	Overlapping Generations
PSID	Panel Study of Income Dynamics
PSM	Propensity Score Matching

EXECUTIVE SUMMARY

Home ownership represents an important social and economic cornerstone of Australian society. In addition to providing security of tenure, ownership has represented an important savings vehicle by which Australians can accumulate wealth over the life-cycle. While aggregate home ownership rates have remained relatively stable over recent decades, this has masked the increasing challenge that some groups have experienced attaining this form of tenure. For example, there is evidence of later transition into home ownership and a lower likelihood of home ownership among middle-upper-income Australians aged 25–44 years. Other groups, such as low-income households, have also experienced declines in home ownership rates.

The reasons for these developments are varied and reflect social and demographic changes that have tended to delay or curtail the attainment of ownership. In some cases, such as later partnering, this will tend to reduce home ownership rates in early parts of the life-cycle. There is also evidence, especially recently, that economic developments have impacted entry into home ownership. Rapid increases in the price of housing have been accompanied by historic low levels of first-time home buyers. Such developments have occurred against a backdrop of relatively low interest rates and a downturn in the economy following the GFC that was moderate compared to other countries. One pattern that has attracted increasing attention is the role of parental transfers in facilitating entry into the housing market. The evidence around the nature and magnitude of such transfers is, however, limited and the analysis in this report seeks to present evidence on this phenomena. In particular, the analysis will consider bequests and *inter vivos* transfers from parents to their children. In examining these intergenerational transfers, three specific questions are addressed:

→ What is the nature of *inter vivos* transfers from older Australians to their children and what role do they play in facilitating sustainable housing outcomes?

→ What is the magnitude and nature of bequests and what role do they play in facilitating entry into the housing market?

→ What are the implications of intergenerational transfers for inequality and what are the likely consequences over time?

The analytical approach in this report is economic in nature. That is, the analysis focuses on how the economic decisions and outcomes of individuals and households are affected by intergenerational transfers. The model of behaviour that motivates the analysis is one in which economic agents make utility maximising subject to the constraints they face. An intergenerational transfer can be characterised as relaxing the constraints faced by the recipients and in doing so present new opportunities for increased consumption, especially housing-related expenditures. Intergenerational transfers are also likely to have important implications for the distribution of wealth and the effect of this is considered in the empirical analysis.

Existing literature on intergenerational transfers highlights the magnitude of such transfers across countries. Moreover, there is evidence, at least in an international context, that intergenerational transfers are used to facilitate and assist with entry into the housing market. The empirical evidence suggests that such transfers allow for entry into the housing market earlier than would be possible in the absence of the transfer, and relaxes the deposit or down payment constraint for first-time home buyers. Further, there is some evidence that intergenerational transfers tend to be inequality reducing reflecting the pattern whereby in a proportional sense, relatively wealthy recipients tend to receive less than their poorer counterparts. In Australia the evidence around the nature, extent and implications of intergenerational transfers is far more limited due, in part, to a paucity of data available for analysis.

The first empirical analysis uses a Propensity Score Matching (PSM) methodology to identify the relationship between tenure outcomes in wave 10 of HILDA and the receipt of intergenerational transfers in the preceding nine waves of HILDA. The PSM methodology allows us to estimate the impact of a 'treatment', such as the receipt of a parental transfer or a bequest, on one group by comparing their outcomes to a control group comprising of persons who have never received a bequest, but who share a similar set of characteristics with the treatment sample.

Its statistical appeal lies in its ability to identify a suitable control group in cases where a treatment is not randomly assigned. Bequests and parental transfers are non-randomly distributed across the population because there are personal characteristics that result in some individuals being more likely to receive these intergenerational transfers. For instance, it is conceivable that a person with a large number of siblings will have lower chances of receiving a parental gift or bequest as compared to a person who is an only child because their parents are less able to assist when there is a large number of children in a household. In this case, simply incorporating an indicator for receiving a transfer in a model of tenure outcome will produce biased estimates, as it will also capture the financial resourcefulness of one-child families and other unobservable factors that are correlated with receiving a bequest. The PSM methodology overcomes the challenge of non-random treatment by identifying a set of control observations that look similar to those which are treated, but which do not actually receive a treatment. The approach is termed 'quasi-experimental' as it provides a way of mimicking a randomised control trial where selection into a treatment is randomly assigned between control and treatment groups.

The first step in the analysis involves identifying appropriate treatment and control groups. Analysis of the impact of bequests on the 'treated group' suggests that such transfers can have a marked impact on the likelihood of being observed in home ownership. The analysis indicates that receipt of a bequest increases home ownership rates *among beneficiaries* by between 4 and 8 percentage points. This impact is the effect of treatment (the receipt of a bequest) on the treated. Outright ownership is estimated to increase to be around 10 percentage points higher among bequest recipients compared to non-recipients among individuals aged 25–65 years of age. Though parental transfers or gifts tend to be smaller than bequests, large impacts of parental transfers on ownership rates are also identified. Such an outcome likely reflects the timing and purpose associated with *inter vivos* transfers.

The analysis of first home ownership uses a duration or hazard rate approach. The analysis identifies a positive relationship between the receipt of intergenerational transfers and the hazard or conditional transition into home ownership tenure for the first time. In particular, for the sample of individuals the hazard or probability of transition into first home ownership is effectively doubled in the period in which a bequest is received. As a point of comparison, marriage more than triples the conditional probability of transitioning into first-time home ownership. For couples, it is the receipt of a bequest in the previous period that is positively associated with the transition into home ownership. In the case of parental transfers or gifts, large (>$5000) *inter vivos* transfers are positively associated with transition into home ownership. The lack of a significant effect for *inter vivos* transfers in general most likely reflects the large number of small non-housing related transfers of this nature reported. Regression analysis also indicates that recipients of transfers (bequests and *inter vivos*) purchase a higher priced house compared to first-time home buyers who do not receive a transfer of this nature. This suggests that intergenerational transfers impact on first home ownership on two dimensions: increasing the likelihood that the recipients transition into ownership and increasing the value of the housing purchased.

The final empirical analysis examines how intergenerational transfers impact on the distribution of wealth. The level of wealth holdings for any given household are likely to depend on a range of factors such as age, human capital, tenure status and transfers received. The focus in this

report is the role of transfers on the distribution of wealth and the methodological approach compares the actual distribution of wealth that is observed with the distribution of wealth that transfers in the form of bequests and *inter vivos* gifts *not occurred*. That is, a counterfactual or hypothetical wealth distribution is constructed on the basis of what would have happened if no *inter vivos* transfer or bequests had been received. Importantly, the methodological approach allows for other determinants of wealth, such as age, education and housing tenure to be controlled for when the counterfactual wealth distributions are calculated.

A key advantage of the methodological approach is that the actual and counterfactual wealth distributions can be presented graphically. This is done using a series of density functions which indicate the likelihood or probability that households have a given level of wealth. The results point to two main findings. First, it is clear that renters are less likely to receive transfers compared to those in home ownership. Moreover, the transfers that did occur over the period 2001–10 tended to increase overall inequality. While the analysis is largely descriptive in nature, it does flag the potential for wealth to become increasingly concentrated over time and the important role that housing and housing tenure may play in such an outcome.

The findings in this report are important for the development of policies around tax and transfer polices in general, along with policies specifically targeted to encouraging home ownership. If the aim is to facilitate home ownership, the findings highlight the need to consider how policies may be more targeted especially to those groups who may not benefit from intergenerational transfers. More generally, the findings provide an opportunity to initiate a discussion around how the large wealth holdings held by older generations that benefitted from increasing house prices can be 'unlocked' so as to directly benefit younger generations, as well as relieving increasing pressure on government budgets.

1   INTRODUCTION

1.1   Motivation and aims of the project

Home ownership represents an important part of the social and economic fabric in Australia. In addition to the security of tenure that ownership brings, it has important economic and welfare implications given the role that housing has traditionally placed in the accumulation of wealth over the life-cycle. The period since the Second World War has been characterised by increasing home ownership rates that plateaued at a relatively high rate compared to other countries. For many Australians, housing careers consisted of a period of co-residence with parents followed by a spell in rental tenure, prior to establishing oneself as an owner in the housing market. Over the life-cycle, there was a general expectation that households would 'trade-up' the property ladder and achieve higher levels of housing consumption.

Over the past few decades, a variety of social and economic developments have impacted on this 'traditional' housing career. Younger Australians, for example, are attaining higher levels of education before entering the workforce. While such a pattern will tend to delay entry into the home ownership market, other developments have led to the interruption of housing careers. In particular, a higher rate of relationship breakdown relative to the immediate post-war period has meant that in many cases housing careers are interrupted midway through the life-cycle.

Economic developments have also been important. In Australia, the period since the mid-1980s has been characterised by cycles featuring steep increases in house prices that then plateau at successively higher real levels. The recent increase in housing prices in Sydney and Melbourne in particular have focused attention on the affordability of housing for younger Australians and its impact on home ownership rates. While the home ownership rate among all individuals increased slightly between 1996 and 2006, this masks some significant changes for particular groups. For example, there is evidence of delayed entry into home ownership and a lower likelihood of home ownership among middle-upper-income young Australians between 25–44 years old and those who are between 45–64 years old and on low-incomes (Yates & Bradbury 2010). Offsetting this, single adults have experienced increases in home ownership (Flood & Baker 2010).

It is the case that there remains some debate about the exact cause of the rapid increase in housing prices in markets such as Sydney and Melbourne. Senior policy-makers including the Reserve Bank of Australia and Treasury have expressed some concern that the increase in prices has a speculative aspect driven by investors, rather than being driven by market fundamentals (Reserve Bank of Australia 2014; Janda & Clarke 2015). There is agreement, however, that the recent increase in prices has occurred at the same time as the proportion of first home buyers in the market has shrunk to historic lows.

The apparent decline in entry into home ownership has a number of important economic implications. If younger Australians were to be excluded from the housing market, there could be important consequences for the accumulation of wealth and, in turn, this could impact on the sustainability of tax and transfer programs (Yates & Bradbury 2010). More generally, inequalities in the generation and distribution of wealth may arise if some groups are systemically excluded from housing markets. In this context, some concern has been expressed that members of the 'Baby Boomers' generation are using accumulated wealth to enhance their own holdings of property and, in doing so, making it more difficult for younger cohorts to move into home ownership (Willetts 2010). In this context, there is a realisation that more recent cohorts of Australians are unlikely to have the same experience of earlier generations which attained high rates of home ownership and then benefitted from the increased wealth that arose from rising property prices.

One development that has gained increasing attention in light of the decline in the proportion of first home buyers is the potential for parental transfers to mitigate the effect of higher housing

prices. Parental or intergenerational assistance may take a number of forms including direct transfers or acting as guarantor for loans taken out by children. While there is some evidence that parental transfers have become more important vehicles by which younger cohorts can enter into home ownership, the evidence remains largely anecdotal (Anonymous 2014; Drury 2014; Yeates 2015).

If intergenerational transfers are important for housing careers, this has important implications on a number of economic, social and policy dimensions. First, intergenerational transfers may be confined to households that are relatively wealthy. Transfers will then have the potential to exacerbate existing inequalities over time. It may be the case, for example, that only younger cohorts in wealthy households receive transfers. These recipients will then have the opportunity to enter home ownership earlier in their housing careers, and are thereby able to accumulate more wealth (through a tax advantaged asset) than younger cohorts in less wealthy households that are unable to make transfers.

In addition, intergenerational transfers have important implications for the design of tax and transfer policies. A well-defined tax system generally attempts to achieve vertical equity, a goal that is achieved when those who have a higher capacity to pay contribute more in the form of higher taxes. If intergenerational transfers are an important means to accumulate wealth, their tax treatment becomes an important question. Similarly, understanding how parental transfers substitute for or complement existing public transfers is important for designing effective policies. It may be the case that in the absence of demand-side subsidies such as the First Home owners Grants Scheme (FHOG), parents provide transfers to their offspring. Alternatively, an increase in such transfers might 'crowd-out' familial transfers so the net effect of such transfers is substantially mitigated. If transfers only occur in relatively affluent households, policy instruments that are targeted or means-tested might be more effective. In short, understanding the nature of transfers from parents to their children is likely to be an important consideration in designing effective policies.

The aim of this project is to improve our understanding of the nature of intergenerational transfers in Australia and their implications for housing outcomes, and related economic behaviours and outcomes. At present, there is little evidence available about the frequency and size of intergenerational transfers or their impact, especially in the context of housing careers. To the extent that there is empirical evidence, it is largely anecdotal, somewhat dated and relies on data that arguably cannot be generalised to the Australian population. In analysing the nature, extent and implications of intergenerational transfers, this project begins to fill an important knowledge gap and thereby provide an evidence base on which policy can be developed.

1.2   Research questions

The research has two aims. First, to provide evidence on how housing careers and related economic outcomes are impacted by intergenerational transfers and the distributional consequences of those transfers over time. In undertaking this analysis, the research will feed directly into a range of policy issues around tax and transfer programs, as well as economic policies to ensure sustained economic growth. Second, the analysis will inform policies designed to ensure the sustainability of housing outcomes over the life-cycle as individuals seek to enter home ownership for the first time or respond to other life-events that impact on tenure status.

The specific research questions to be addressed are:

1. What is the magnitude and nature of bequests and what role do they play in facilitating home ownership, changes in housing consumption or assisting home buying households into outright home ownership?

2. What is the nature of *inter vivos* transfers from older Australians to their children and what role do they play in facilitating sustainable housing outcomes?

3. What are the implications of intergenerational transfers for inequality and what are the likely consequences over time?

The research questions are addressed via three related but nonetheless distinct pieces of quantitative analysis. In each case the analysis is undertaken using the Household, Income and Labour Dynamics in Australia (HILDA) dataset produced by the Melbourne Institute of Applied Economic Research.[1] The HILDA dataset is a longitudinal database that contains a rich array of individual and household level information on key demographic, labour market and housing market measures; it also provides information on individuals' family background, such as parents' labour market and occupational status and parents' educational attainment. The HILDA data has been collected annually since 2001 and 13 waves of data are available for analysis.

The first empirical analysis (Chapter 4) examines the tenure outcomes for individuals/ households in 2010 or wave 10 of the HILDA data. The approach adopted is a propensity score methodology (PSM) which allows the effect of some 'event' or 'treatment', such as the receipt of a bequest or transfer (hereafter referred to as the treatment group), to be robustly measured when selection into a treatment is not randomly assigned. For instance, it is conceivable that a person with a large number of siblings will have lower chances of receiving a parental gift or bequest as compared to a person who is an only child because their parents are less able to assist when there is a large number of children in a household. The PSM allows us to compare 'like-with-like' by identifying a control group of individuals who did not receive a bequest/transfer, but who have personal characteristics similar to those of the treatment group of individuals who did receive a bequest/transfer over the study timeframe. The method attributes any difference in housing outcomes between control and treatment groups to the effect of the bequest/transfer. The analysis will address research questions 1 and 2 and focus on the role of intergenerational transfers in the form of bequests or parental transfers on housing outcomes at a point in time.

The second empirical analysis (Chapter 5) presents the results from an analysis of first home ownership. In particular, a series of hazard or duration models are estimated and reported that identifies the determinants of entry into first home ownership. As with the analysis in Chapter 4, of key interest is the role of the receipt and amount of bequests or parental transfers on housing outcomes, in this case first home ownership. In addition, data is presented that shows how the receipt of bequests and parental transfers is correlated with the purchase price and value of loan for first home buyers. If parental transfers or bequests do in fact affect the decisions of first home buyers, then adjustment may occur with respect to the timing of the purchase, or the size of the house purchased. The analysis in Chapter 5 will shed light on this issue and in doing so address research questions 1 and 2.

The final empirical analysis (Chapter 6) will focus on the impact of intergenerational transfers on inequality. Statistical techniques will be applied to selected waves of the HILDA data to identify how intergenerational transfers affect the distribution of wealth over time and in doing so address research question 3.

The remainder of the report is set out as follows. In Chapter 2, a discussion of the institutional, policy and theoretical context in which the analysis is set against is presented. In effect, Chapter 2 will 'set the scene' for the remainder of the report by providing context in which the

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[1] 'This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the author and should not be attributed to either DSS or the Melbourne Institute.'

analysis is conducted and interpreted. Following this, a literature review around the question of intergenerational transfers and housing outcomes is set out. The emphasis in this chapter will be on existing empirical analyses that have examined the extent of intergenerational transfers and their relationship to housing outcomes and distribution of wealth. Chapters 4, 5 and 6 will contain the empirical analysis described above. In Chapter 7, the policy implications of the analysis is described. Finally, in Chapter 8 concluding comments are set out and possible avenues for future research flagged.

The empirical analysis in this report highlights the important role that intergenerational transfers make for the observed housing outcomes of Australian households. In particular, we find evidence that intergenerational transfers in the form of bequests and parental transfers are associated with housing outcomes. The analysis in Chapter 4 identifies a statistically significant positive relationship between the receipt of a bequest and home ownership. In particular, the receipt of a bequest increases rates of home ownership by between 4 and 8 percentage points. While the value of parental transfers is somewhat smaller, the analysis in Chapter 4 also identifies large effects of such transfers on home ownership outcomes in Wave 10 of the HILDA dataset. It is possible that such a finding reflects the more targeted nature of parental transfers in terms of their purpose and timing. In a similar fashion, the duration analysis in Chapter 5 finds evidence that receipt of a bequest and parental transfers are associated with faster entry into first home ownership.

There is also evidence that transfers in the form of bequests and *inter vivos* gifts from parents affect the distribution of wealth. These have an important housing dimension as the analysis in Chapter 6 finds that renters are less likely to receive transfers. Moreover, the net effect of such transfers over the period up to 2010 indicates that they have tended to increase the level of inequality.

The findings in this report highlight some significant policy challenges. While economic theory provides insight into what might be the appropriate response in terms of the design of tax and transfer policies, there are specific limitations in place in this regard. Those limitations reflect current and historical institutional arrangements that mean it is unlikely that a 'textbook' response is possible. For example, while the economic argument for wealth taxes can be set out and the rationale for including the imputed rent from owner-occupied housing in means tests may be compelling, historical and institutional arrangements mean such policies response are most likely unfeasible.

What the analysis in this report does highlight is the need for a conversation around the 'welfare role' of housing and housing wealth. Moreover, this discussion should acknowledge that housing represents an important intergenerational mechanism whereby advantageous outcomes can be extended to the next generation. In doing so it is clear that intergenerational transmission of wealth and socio-economic status extend beyond the pathways, such as education, which have been acknowledged and studied in the literature previously. In turn, targeted policies, such as first home buyer grants, may need to consider how such policies can take into account the role played by intergenerational transfers on housing-related outcomes.

2 THE HISTORICAL, POLICY AND THEORETICAL CONTEXT

This chapter provides a general overview of historical, institutional and theoretical considerations that are critical for understanding the analysis in this report. That is, it provides a context and a framework against which the remainder of the report can be read and interpreted. The reader is also directed to the Positioning Paper that accompanies this report (Barrett et al. 2015) for additional discussion.

2.1 Institutional and policy considerations

2.1.1 Historical developments

Historically, home ownership has been the dominant form of housing tenure in Australia. Following the Second World War, the Australian Government actively promoted home ownership for a variety of economic and social reasons. After increasing rapidly during the 1950s, since the early 1960s the home ownership rate has been relatively steady at around 70 per cent (Kryger 2009). Outright ownership has fluctuated over time so that although around one-half of home-owning households were outright owners in 1981, by 2001 that figure had increased to around 60 per cent. Traditionally, around 25 per cent of households are tenured in private sector rentals and around 5 per cent in public housing. The latter form of tenure in particular has been increasingly seen as a residual form of tenure occupied by individuals and households with high needs such as the long-term unemployed, sole-parent households and the disabled (Jacobs et al. 2010).

The aggregate trends in housing described above mask some underlying changes in the nature of housing tenure in Australia. Yates (2000, 2002) and Flood and Baker (2010) document that over the period 1986–2006 there were sustained falls in the rate of home ownership among households in the 25–44-year-old age groups of around 15 per cent. Burke et al. (2014) have identified how home ownership rates have changed for successive cohorts of Australians. The evidence (Table 1 below) points to a substantial decline in the ownership rates among younger households over time. For example, among 25–34-year olds, the proportion of households in home ownership has declined by one fifth, from over 60 per cent to less than 50 per cent over the three decades beginning 1981. A similar, though somewhat less pronounced decline, has occurred in the households aged 35–44 years of age. Also of note is that although home ownership rates have remained relatively stable for older age groups (45–54 and 55–64 years of age), outright ownership rates have fallen for these groups over time. Such a change may, of course, simply point to transitions to home ownership being delayed as opposed to not occurring at all.

Particular concern has also been expressed that first-time home ownership has become increasingly unattainable. The Australian Bureau of Statistics (ABS) data indicate that the proportion of households that are first-time buyers has fallen to historically low levels in recent years. In Figure 1 below we show the proportion of first home buyers in Australia and separately for New South Wales and Victoria. In New South Wales in particular, where affordability issues are cited as being particularly acute, the proportion of first home buyers has fallen to around 12 per cent for approximately two years. Similarly, for Australia, the proportion of first home buyers has fallen to some of the lowest levels, around 15 per cent, recorded during the 30 years during which data have been collected (Bloxham et al. 2010).

Table 1: Home ownership rates, by age cohorts, 1981–2011

Year	Age cohorts	Owner	Purchaser	Home ownership
1981		9.7%	51.7%	61.4%
1991	25–34 years	14.1%	39.0%	53.1%
2001		11.3%	40.0%	51.3%
2011		5.1%	43.3%	48.4%
1981		21.6%	52.7%	74.3%
1991	35–44 years	28.2%	42.2%	69.4%
2001		23.2%	45.9%	69.2%
2011		10.4%	54.9%	65.3%
1981		39.6%	38.7%	78.3%
1991	45–54 years	46.6%	29.4%	76.0%
2001		42.3%	35.7%	78.0%
2011		24.9%	49.1%	74.0%
1981		57.2%	23.4%	80.6%
1991	55–64 years	66.8%	12.3%	79.1%
2001		66.7%	15.9%	82.6%
2011		48.0%	32.2%	80.2%

Source: Burke, Stone and Ralston (2014)

Figure 1: First home buyers as a proportion of total home buyers
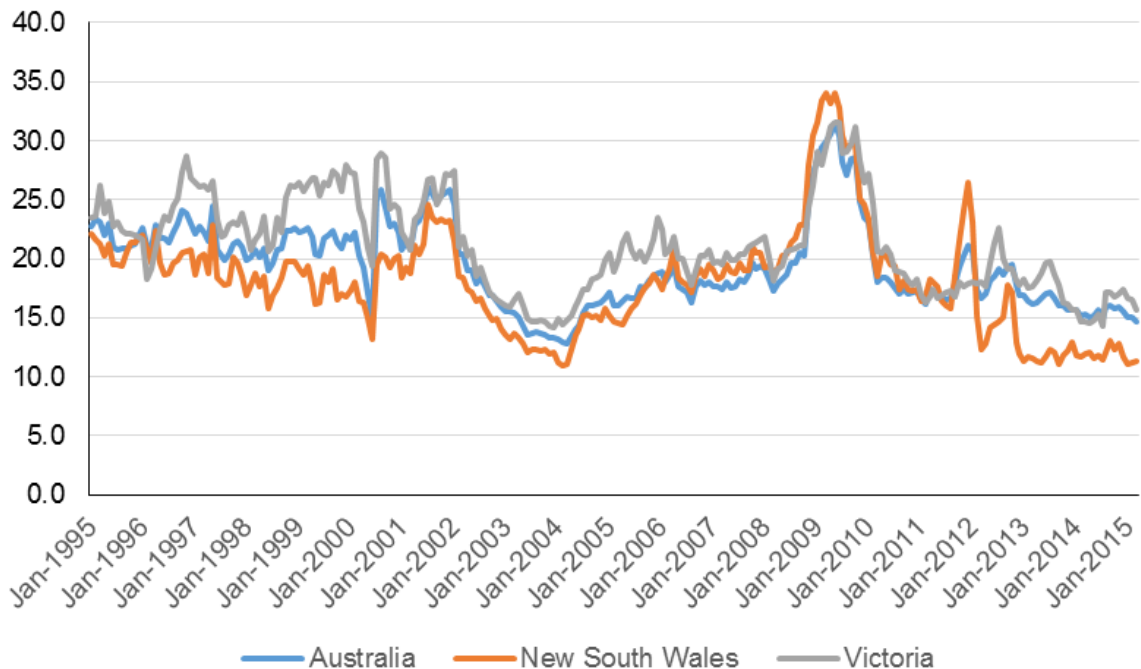
Source: Authors' calculations using ABS (2015)

A variety of factors are cited for these developments including the presence of an increasing number of investors and dual income childless households in the property market. For some groups, such as the low-income older age groups who experienced declining rates of home

ownership over the periods 1996–2006 may have been permanently 'scarred' by the challenging economic circumstances experienced in the decade between 1983 and 1993, along with challenges in the housing market such as the high interest rates in the late 1980s. Significantly, Flood and Baker (2010) also identify a loss of outright ownership among young households; a pattern they suggest may be attributable to decreases in the level of bequests received by this group.

Of course changes in housing outcomes need to be assessed in the context of wider changes in the socio-demographic and socio-economic space. Social changes around norms relating to marriage, education and career have also changed significantly over the past three decades (Flatau et al. 2007). As in other countries, Australians have delayed marriage and fertility decisions, and attained increasing levels of education over time. More recently they have also tended to remain in the parental home for longer periods (Cobb-Clark & Gorgens 2014). These social and economic developments have been cited as important considerations for changes in home ownership rates in other countries. In the United States context, Fisher and Gervais (2011) note that delays in partnering will mechanically lower home ownership rates while increased uncertainty associated with earnings will also tend to reduce the rate of home ownership. Similarly, in the United Kingdom, Andrew (2010) highlights the likelihood that increased student debt will delay entry into home ownership for future graduates.

The change in tenure outcomes also reflects changing economic conditions faced by households over the past few decades, especially in recent years where house prices have increased rapidly in some markets. In Figure 2 below the change in house prices across Australia and the capital cities is presented. Though the index *does not* allow the *level* of house prices to be compared, it does show how prices have changed over time across locations. For example, there is clear evidence of the rapid increase in prices in Perth that coincided with the mining boom in the mid-2000s, along with the rapid increase in the Sydney market over the past three years.

Figure 2: House price index, Australia and capital cities 2003–14
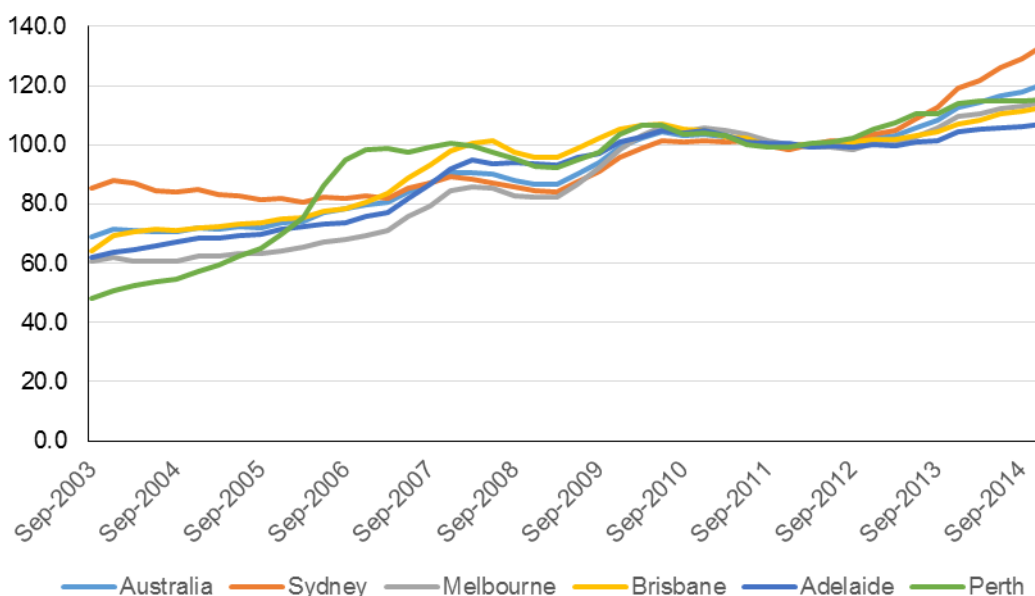
Source: Authors' calculations using ABS (2015)

When analysing home ownership in Australia, an important consideration is its function as a store of wealth. Traditionally, housing has represented the largest component of a household's asset portfolio and the principal savings vehicle for Australian households (Findlay 2010; Headey et al. 2005). For example, notwithstanding the Global Financial Crisis (GFC) between

2006 and 2010, the share of real estate in asset holdings for Australian households increased from 54 per cent to 60 per cent. As discussed below, there are sound financial and economic reasons why housing represents such a significant component of household wealth holdings.

2.1.2 Policy context—tax and transfer policies

High levels of home ownership have been considered to be an important objective for successive governments over time and this is reflected in a range of policy settings. For example, housing assets generally receive generous tax treatment and are treated favourably in the context of Australia's income support framework. Transfers from the government are generally non-contributory and heavily means-tested, though the family home is generally excluded from any assets test that does apply (Whiteford 2010). In the context of the retirement incomes system, home ownership is identified implicitly, if not explicitly, as an important means of saving and one of the 'pillars' of retirement income (Yates & Bradbury 2010).

A variety of tax concessions also apply to owner-occupied housing. Capital gains on owner-occupied housing are not taxable and nor is the imputed rent on owner occupied housing. First-time home buyers generally receive some reduction in stamp duty payable on the purchase transaction, though over recent times such concessions have been targeted to the buyers constructing new houses (Office of State Revenue 2012). It is also notable that during the late 1970s successive governments abolished death duties and gift duties. While applying more widely than real property assets, in many cases such taxes would have applied to housing assets transferred *inter vivos* or at death.

The recent review of the Australian taxation system, the 'Henry Tax Review', made some recommendations about the treatment of housing including the retention of the means test exemption for owner-occupied housing up to a generous threshold (Department of Treasury 2010). At the same time, no specific recommendation was made about the possible reintroduction of a wealth transfer tax such as a tax on bequests. Significantly, a specific recommendation was made to replace the existing taxes on the conveyance of land with a broad-based land tax, though to date only the Australian Capital Territory has initiated such a reform (McLaren 2013).

The current Commonwealth Government has committed to a wide ranging review of the Australian taxation system (Australian Government 2015). Notwithstanding this, it notes 'that there is a strong consensus that it would not be appropriate to tax either the imputed rent on owner-occupied housing or capital gains derived from it' (p.65). This suggests that it is likely that owner-occupied housing will retain its tax advantageous status into the future and continue to represent an important means by which households can accumulate savings over the life cycle.

It is also the case that government policy has supported home ownership through direct grants to first home buyers (FHOG) (Wood et al. 2010). Although originally introduced in 2000 to offset, at least partially, the effect of the GST for new home buyers these grants to first-time owner occupiers remain. During the GFC the amounts available under the FHOG were temporarily increased and more recently the grants have been redirected by the states which administer the schemes to focus on the purchase of newly constructed housing (Office of State Revenue 2012). The impact of subsidies such as the FHOG scheme have been analysed by a number of researchers with the finding that such schemes generally have only a limited impact on the attainment of home ownership. While such subsidies relax the deposit gap faced by potential home owners, it has little or no impact on the ongoing borrowing constraints faced by households and merely serves to bring forward the purchase of housing for those households that would have eventually purchased rather than remain in the private rental market (Wood et al. 2010). Moreover, there is the potential for such subsidies to be captured by the supply side of the market (Dungey et al. 2011).

2.2 Theoretical context

The analysis in this project is quantitative in nature and relies on an economic framework. In the Positioning Paper (Barrett et al. 2015) an extended discussion was set out that described the nature of the economic approach and how it could be usefully applied to understand and analyse the processes of interest in the current report. The interested reader is directed to that publication for a more detailed discussion of the economic approach to analysing economic decisions and outcomes. Below is an abridged version of that discussion.

From an economic perspective, agents (individuals or households) are assumed to 'optimise' or make the best possible choices subject to the constraints they face. In the current context, the constraints that a household or individuals may face could include the level of income they earn or credit market constraints that limit the amount of borrowing that can be undertaken against expected future earnings. In this setting, interest is generally focused on how behaviour and outcomes change when the constraints that agents face vary. The models are generally somewhat simplified abstractions of what is happening in the real world, though economic models are generally a rich source of testable hypotheses.

2.2.1 A basic model

The general approach in economics is to argue that economic agents make the best possible decisions given the constraints that they face.[2] The manner in which this is usually conceptualised is that agents maximise utility subject to a budget constraint. Typically, agents are assumed to consume a bundle or set of goods that are denoted as x. Here, x may consist of a bundle of goods such as food, clothing and shelter or housing. In general, economists argue that if the size of x increases, that is the bundle of goods that an agent consumes increase, then utility also increases.

Agents are generally constrained from consuming unlimited amounts of goods and services. The most important constraint and the one that can be readily identified is the budget constraint. In short, with a limited income (which we refer to as m), agents only have so much to spend on the items they may wish to consume. Total expenditure on all goods must be less than or equal to income (m). We can then think of the economic agent's problem as that of maximising utility subject to their budget constraint. For example, households will choose quantities of food (*f*), clothing (*c*) and housing (*h*) so as to maximise utility subject to the budget constraint. More formally, we can write the following problem:

$$\max_{c,f,h} \quad U(x) \quad subject\ to\ p_c \cdot c + p_f \cdot f + p_h \cdot h \leq m$$

where x is a vector representing the quantities of food, clothing and housing consumed.

This description of the economic approach is clearly highly stylised. It considers only three goods for instance. Likewise, there is no provision for saving in the model where an agent may defer consumption until a later period, or use borrowings to bring consumption forward in time. Clearly, such a consideration is pertinent for housing where purchases of housing services are often associated with the use of a loan (mortgage). One manner by which such considerations can be introduced into a model is through a life-cycle model.

2.2.2 A life-cycle model

A 'life-cycle' model captures the notion that individuals age over time and undertake very different economic activities at different stages of life. Young individuals tend to invest in

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[2] Throughout the discussion we will refer to 'economic agents' without identifying exactly the nature of the who or what is an 'agent'. In many cases decisions are made by individuals, in other cases, decisions are made by 'households'. In the empirical analysis the analysis will examine the outcomes for both individuals and households depending on the analysis being undertaken.

human capital by acquiring education. Following a period during which they enter the labour force and save, they will generally retire and draw down accumulated wealth. Both the behaviours and the constraints faced during each stage of the life-cycle differ. These changes are often associated with important life events such as marriage and the birth of children which also coincide with housing-related decisions. The life-cycle model attempts to capture these important changes and identify the implications for economic behaviours and outcomes.

The simplest way to extend the basic model described above is to incorporate life-cycle considerations into a two or more period model. For example, suppose that agents live for two periods, $t = 0 \; and \; t = 1$.[3] In the first period, individuals choose not only how much to consume but also how much to save. Saving is important because in the second period individuals do not work and the amount of resources available for consumption might simply consist of earnings from accumulated saving and the savings themselves. Moreover, if individuals can choose how much they wish to work in the first period, $t = 0$, then decisions around work effort (and hence income levels) and savings choices can be identified from the model.

In such a case, the problem facing the individual may look like the following:

$$\max_{c_0, c_1} \quad U(c_0, c_1) \qquad subject \; to \qquad c_0 + c_1 \cdot \frac{1}{(1+r)} \leq y_0 + y_1(1+r)$$

where c_0 is consumption in period 0; c_1 is consumption in the second period; y_0 is the first period income; y_1 is second period income, and r is the interest rate. In this case, the inter-temporal budget constraint simply requires that lifetime consumption is less than or equal to lifetime income. Consumption can be moved across periods by saving and borrowing.

It is important to include this temporal aspect into models of economic behaviour that consider choices around housing, since housing is an asset that if purchased in t=0 provides a stream of services that can be consumed in t=1. While housing services can be purchased like other services in the rental market, home ownership generally involves large lumpy expenditures financed by borrowing in capital markets.

One relevant feature of borrowing and savings in capital markets is noteworthy. The nature of capital markets means that loans must generally be backed by collateral and this generally introduces an important constraint facing most households, namely an inability to borrow against future earnings. These capital market imperfections mean that households often face credit or collateral constraints. The inability to borrow against future income streams may mean that a household is constrained and therefore cannot purchase the desired level of housing (Zeldes 1989).

The simple multi-period model described above can be generalised in a way that highlights how the issue of intergenerational transfers, the focus of this study, can be explored.

2.2.3 Overlapping generations model

Overlapping generation models analyse economies consisting of a series of 'generations'. Consider a life-cycle model in which individuals 'live' for three periods. At a given point in time there may be a 'young cohort' composed of dependent children who are accumulating human capital through schooling; a 'middle cohort' composed of working households with dependent children; and, an 'old cohort' who have retired and whose consumption is financed by accumulated savings. In such economies, cohorts progressively age so the young cohort in

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[3] Here the two periods might be considered to represent the period of one's life when they are working $(t = 0)$ and the period when they are retired $(t = 1)$. A more complex model would have additional periods such as when one is investing in education.

this period becomes the 'middle-aged' cohort in the following period. Similarly, the old cohort 'die' in the following period.

Where economic agents (individuals or households) have children, the welfare of those children directly or indirectly impact on the wellbeing of the parent. For example, parents who are concerned about the future incomes of children may make investments in their child's education. Alternatively, they may transfer resources to the children through a gift or a loan if the child faces capital market constraints. Similarly, old households that will 'die' in the following period may increase the welfare of their children (the 'middle cohort') by bequeathing some assets upon their death.

The transfers identified may be in the form of *inter vivos* gifts or loans, or they may be associated with bequests. There is an extensive literature that examines the motivations behind such transfers (Laferrère & Wolff 2006). These may include altruism, exchange motives, demonstration effects and insurance motives (Cox 1987). In general, such models extend beyond what is required for an understanding of the behaviours and outcomes considered in this report. Nonetheless, at an intuitive level the potential implications of *inter vivos* transfers and bequests can be readily understood.

Consider, for example, an *inter vivos* transfer from a parent to an adult child. Recall that the life-cycle model requires that lifetime consumption be no greater than lifetime resources or income. An unanticipated transfer effectively increases the expected lifetime income of the child and allows for greater consumption opportunities over the remainder of the recipient's life. This may, for example, lead to an increase in housing consumption through the purchase of a larger house. Alternatively, if the child had been constrained by credit market imperfections that meant they were unable to purchase housing, the transfer may relax this constraint and allow the child to increase the amount of housing consumed or do so sooner by reducing the time required to save for a down-payment. An unanticipated transfer represents an income shock in the context of the life-cycle model that allows higher consumption during the remainder of an individual's life. In effect, the transfer represents an unexpected increase in lifetime income and it might be expected that such a positive shock will lead to increased consumption of all goods including housing services over the recipient's lifetime.

It is important to emphasise that there are a number of alternative mechanisms by which such transfers might impact on economic behaviours (Guiso & Jappelli 2002; Mayer & Engelhardt 1996). Households that receive transfers may, for example, reduce their own savings. Alternatively, the transfer may be used to supplement the recipients own savings and thereby increase the value of the housing services consumed by purchasing a larger house or better quality house. Housing purchase decisions may also be brought forward in time by supplementing the recipient's own savings with the transfer and relaxing the down payment constraint that purchasers generally face. Alternatively, the transfer may be simply used to increase the level of deposit or down-payment that a household puts down, thereby reducing the mortgage repayments they face.

In some cases transfers may be anticipated and such transfers are likely to have different implications for observed behaviours and outcomes. In the case of bequests for example, it may be the case that they are anticipated though the exact timing and amount is unknown. Similarly, children may (correctly) expect that parents will make *inter vivos* transfers at some point, though the size and timing remains unknown.

There are a number of avenues through which an anticipated transfer may change economic behaviours. For example, consider a household that is credit constrained but is anticipating a transfer in the future. Current consumption of housing services may increase if the transfer means that a deposit constraint is less likely to be binding in the future. It is important to note that anticipated transfers are also likely to have more nuanced implications for economic behaviour and outcomes beyond those directly related to housing decisions. For example,

anticipation of a large transfer in the future may lead to an individual investing less in acquiring human capital or education. In turn, consumption may be higher in earlier stages in the life-cycle (other things being equal) in the expectation that lifetime resources will be boosted by the receipt of the (anticipated) transfer later in the life-cycle. More generally, a household that anticipates receipt of an *inter vivos* transfer or bequest may save less in the current period and increase consumption of all goods, not just housing, in the future. In effect, an anticipated transfer relaxes the lifetime constraint by increasing expected lifetime income.

It is also important to note that by incorporating bequests and other transfers into an overlapping generations (OLG) model it is possible to identify how the distribution of wealth and inequality may evolve over time (Gokhale et al. 2001).

The discussion above has been general in nature and has presented the intuition associated with the relationship between intergenerational transfers and housing and related economic outcomes. In the next chapter, we discuss existing evidence on the impact of transfers on outcomes, with particular reference to housing outcomes.

3   LITERATURE REVIEW

A detailed literature review was set out in the Positioning Paper for this project (Barrett et al. 2015). The short literature survey set out below highlights some key studies around the same themes that the empirical analysis in Chapter 4 through to Chapter 6 address, along with some studies not identified in Barrett et al. (2015). With most of the literature dealing with international evidence, it is important to understand that policy implications are likely to be heavily dependent on the institutional framework being considered. For example, the empirical evidence discussed below highlights how in some countries intergenerational transfers reflect social norms whereby resources are pooled across generations; in other countries the transfers are important in a context where credit markets are poorly developed. Likewise, tax policies are likely to be an important determinant of the extent and form that transfers take. While the Australian context has been described briefly in Chapter 2, it is important to keep this in mind when considering the empirical evidence described below.

3.1   International evidence

3.1.1 The nature and magnitude of transfers

In general, there is limited evidence around the extent of intergenerational transfers and the behavioural implications of those transfers. In most cases such transfers occur within families. The lack of empirical evidence around such transfers reflects two considerations. First, that economic interest in the importance of transfers is relatively new reflecting a growing awareness of the importance of non-market intra-family interactions. While many of these transactions have an exchange nature to them, other transfers appear to be purely altruistic in nature (Laferrère & Wolff 2006). The second is the lack of data that has been available for analysing the nature of transfers and their implications for behaviours and outcomes.

For the United States, Schoeni (1997) uses the Panel Study of Income Dynamics (PSID) to examine transfers, both *inter vivos* and bequests. While such transfers often take the form of direct cash transfers or in-kind gifts, Schoeni (1997) also identifies the substantial nature of time transfers that occur. For downwards intergenerational transfers, he notes that the likelihood that a transfer is received and the amount transferred is positively associated with parental wealth. Conversely, for recipients of transfers, the incidence of receipt and the amount received is negatively related to household resources. Such a pattern may reflect altruistic or insurance motives. That is, parents transfer resources to children as they are concerned about the child's wellbeing, or because the transfer alleviates a shock experienced by the recipient household. Similarly, Berry (2008) shows that those individuals who receive financial transfers are more likely to be needy. It is noteworthy that the evidence also suggests that recipients are less likely to be home owners. McGarry (1999) argues that while *inter vivos* transfers from parents are generally negatively correlated with the recipient's current income, no such relationship exists for bequests. Rather, bequests are more likely to be negatively related to the recipient's permanent or expected lifetime income.

Zissimopoulos and Smith (2011) present evidence about the transfers made by parents to their children in Europe and in doing so compares their behaviour to that of parents in the United States. The analysis suggests that transfers in the United States are approximately 50 per cent higher than in Europe. Significantly, Zissimopoulos and Smith (2011) note that transfer behaviour varies across European countries. These differences appear to reflect differences in cultural or social norms, and, institutional and policy settings. For example, there is some evidence that public expenditures on family policies is negatively related to parental monetary gifts, though the impact is relatively small and does not imply that public expenditures crowd out intra-familial transfers. Also in a European context, Emery (2013) highlights the important role played by the number of siblings on the likelihood that a child receives a parental transfer. The analysis suggests that the number of siblings is substantially more important than parental

income in explaining the extent of transfers. In terms of bequests, Karagiannaki (2015) documents the magnitude of bequests in Britain over a 35-year period to 2010. The data indicate a substantial increase in the value of estate assets passing on death during this period, with the increase largely though not solely reflecting the increase in the value of housing assets over this time. That is, though housing assets were the main contributor to the increase in the value of inheritances over this period, there were also substantial increases in financial assets. It is important to note that the proportion of the adult population receiving bequests may be considered relatively small in any given year, being approximately 2 per cent of the population annually.

Transfers, especially bequests may also be important for the level of inequality. Zissimopoulos and Smith (2011), however, conclude that the average amount of gifts provided to children by parents across the countries studied did not appear to be substantial enough to affect wealth inequalities across generations. For the United Kingdom, Karagiannaki (2015) found that the greater dispersion of inheritances among inheritors tended to increase the level of inequality during the period 1985–2010. However, this was offset by an increase in the proportion of the population that actually received large inheritances.

3.1.2 The impact of transfers on housing and related outcomes

A number of studies have sought to identify the various mechanisms by which intergenerational transfers may impact on housing-related decisions. Recall that housing-related decisions such as the timing of home purchase, the size of mortgage borrowings and the quantity of housing services may all be affected by the receipt of transfers. For the United States, Engelhardt and Mayer (1998) find evidence of transfers affecting housing decisions on multiple dimensions. Recipients of transfers generally spend a shorter period saving for down payments or deposits and reducing their own saving for every dollar in transfers received. In addition, there is evidence that the down payment is higher among transfer recipients, and the value of the house purchased is higher. Luea (2008) provides more recent evidence and finds that recipients of intergenerational transfers are 1.2 times more likely to purchase a home compared to non-recipients with the largest impact on those who receive relatively large transfers. There is also evidence that the amount of housing services purchased increased with the value of the transfer, but do not necessarily reduce the mortgage burden incurred.

Analysis for Europe is more nuanced, reflecting the variety of institutional regimes and social norms across countries. Kurz (2004) considers home ownership outcomes for successive birth cohorts in West Germany. Though a direct measure of inheritances is not available, the analysis indicates that the children of home owners are more likely themselves to transition into home ownership. Clearer evidence of the relationship between intergenerational transfers and tenure outcomes is provided for Italy by Guiso and Jappelli (2002) who find that transfers (bequests and *inter vivos* gifts) have only a small impact on the time spent saving for a down payment. Nonetheless, it is important to emphasise that entry into home ownership in Italy generally occurs much later than in other countries, with home ownership rates peaking just prior to retirement. For Ireland, Duffy and Roche (2007) find that around one-third of households receive an *inter vivos* transfer and the transfer represented 21 per cent of the down payment for a newly purchased home. Spilerman and Wolff (2012) note that parental transfers impact on both the likelihood that individuals are home owners and the amount of housing consumed in France.

There is also evidence around the intergenerational transfers for North European countries. Using a large administrative dataset for Danish households, Kolodziejczyk and Leth-Petersen (2013) find little evidence that intergenerational transfers are used to support home ownership. For the Netherlands, Mulder and Smits (2013) report that around 9 per cent of individuals receive financial support for home ownership from parents. It is noteworthy that there is little evidence that financial support from parents was based on the child's needs, nor that support was directed explicitly towards support for ownership *per se.*

Two other types of analysis are relevant for understanding the relationship between intergenerational transfers and housing outcomes. The first utilise changes in tax laws that may directly or indirectly affect transfers and housing outcomes. Yututake et al. (2011) model the relationship between transfers and housing-related decisions using Japanese data that relies on changes in tax policies around gifts designed to encourage investment in housing. The analysis indicates that a reduction in taxes associated with gifts for the purpose of acquiring a residence does in fact lead to higher investment in housing. Nonetheless, its net impact is relatively small. Japelli et al. (2014) also exploit policy changes to identify how intergenerational transfers in Italy are impacted by the abolition of transfer taxes, namely gift and bequests. They find evidence that the likelihood of making transfers is negatively related to transfer taxes. That is, the reduction of taxes tended to increase the likelihood that real assets are transferred across generations.

The second type of study of interest focuses on the effect of transfers on the accumulation of wealth. For the United States, Boehm and Schlottmann (2001) find that children of home owners are more likely to enter into home ownership. Moreover, higher levels of education of children leads to greater levels of housing and non-housing wealth accumulation for the children of home owners. Interestingly, they find that low-income households accumulate less wealth over the period for every dollar in gifts received compared to higher income households. A study by Wolff and Gittleman (2014) found that between 1989 and 2007 the proportion of households reporting the receipt of *inter vivos* transfers increased by almost fourfold, from 1 per cent to almost 4 per cent. Moreover, the value of gifts increased substantially during this period. It is notable that no such trends were observed for bequests over this period. The analysis of transfers, both bequests and *inter vivos*, suggested they tended to be equalising or inequality reducing. Although wealthier households tended to receive greater transfers, they were smaller in a proportional sense than those received by less wealthy households.

Table A1 in the Appendices of the Positioning Paper (Barrett et al. 2015) provides a summary of the key findings identified in the international literature cited above as well as Australian studies covered in the next section.

3.2 Australian evidence

For Australia, evidence on the extent of and impact of intergenerational transfers is limited. An early study by O'Dwyer (2001) used data on deceased estates to examine the frequency with which individuals receive bequests, especially those related to property. The study did identify some interesting patterns. For example, older households generally hold lower levels of housing assets than younger cohorts. This reflects a cohort effect, with younger households experiencing higher lifetime incomes that are reflected in their wealth holdings, including property. Moreover, older cohorts have generally entered into the dissaving segment of the life-cycle and experience declining levels of wealth including housing wealth.

Similar to the United Kingdom (Karagiannaki 2015), O'Dwyer (2001) finds that few households receive a bequest on an annual basis. Moreover, as bequests are usually divided among living descendants, it is argued that labour market outcomes are likely to be more important than inheritances in determining life chances and the distribution of wealth. Nonetheless, it is the case that individuals in occupations that may be considered more prestigious, such as managers, tend to receive higher bequests than those who are less skilled. Moreover, those inheritances are themselves positively correlated with the housing wealth of beneficiaries. This suggests that it is possible that the transfers of wealth via bequests may exacerbate existing inequalities over time.

King and McDonald (1999) examine intergenerational transfers using the ABS *Survey of Families 1992*. The data also provides some information on the provision of gifts or loans for the purchase of property. Assistance with home or land purchase peaks at ages 30–35 years for recipients and around 5.5 per cent of respondents report receiving this type of transfer in

the previous 10 years. Inheritances are reported to be received by around 3 per cent of the population in the previous 10 years, peaking at the age of 50–60 years as parents pass away. The value of inheritances also tends to be substantially higher than the average value of gifts or loans. Overall, the evidence suggests that inter-household/inter-family transfers are common, and have a potentially important influence on the housing careers of recipients.

4 ATTAINMENT OF HOME OWNERSHIP AND OUTRIGHT OWNERSHIP; A PROPENSITY SCORE APPROACH

In this chapter we ask the following key research questions:

→ Is the receipt of a bequest (gift) from parents positively associated with home ownership status?

→ Does the receipt of a bequest (gift) from parents ease transitions to outright home ownership?

These questions were investigated in the Positioning Paper and addressed using a sample of individuals aged 25–65 years in wave 10 (2010) of the HILDA data. Their 2010 tenure outcomes, and the role of bequests and transfers, was explored in a series of probit models that relate tenure choice to the observable characteristics of individuals. The tenure choice models had the following specification:

$$T_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \varepsilon_i$$

where T_i is a measure of tenure status in 2010 equal to 1 if the individual is a home owner (in wave 10), or zero otherwise; X_i is a vector of socio-demographic and socio-economic variables (as measured in 2010) that capture some of the key determinants of housing tenure, and Z_i is a measure of the receipt of a parental transfer or bequest that takes the value 1 if one or more bequests (parental transfers) were received between 2002 and 2010, zero otherwise. In other models that were estimated, the vector Z_i captures the value of the parental transfers or bequests that is received.

Results from the probit analysis suggested that receipt of bequests increases the likelihood that individuals attain home ownership. They also confirmed the role of bequests in accelerating the achievement of outright ownership. We found statistically significant but modest effects. For example, we predicted that receipt of a bequest over the previous nine-year period lifts the probability of being in home ownership by 2–4 percentage points, with an even larger impact on the likelihood of attaining outright home ownership. The larger effect on outright ownership might reflect the later stage of the life cycle at which bequests are typically received; in other words, bequests are often received after first home ownership has been achieved.[4]

Despite receipt earlier in the life cycle, model specifications that included the receipt of gifts suggest that they are a less important influence on tenure status in wave 10. In general, there is no evidence that the receipt of a gift *per se* is associated with a higher probability that the individual is observed in home ownership.

In this Final Report we offer findings from an alternative methodology to the tenure choice modelling approach that is based on improved measures of the socio-economic and demographic controls employed in our probit models.[5] The propensity score matching (PSM) approach we invoke here mimics the methods of a randomised control trial. In the social sciences it is generally impossible to undertake randomised experiments allowing for well-defined treatment and control groups. However, in the medical sciences the conduct of randomised trials is routine; for example, new drugs are invariably trialed by taking a group of patients who are willing to participate in a trial and suffer the same medical ailment. A randomly-selected 'treatment' group receive the drug while the remaining patients receive a placebo; patients do not know whether they receive the placebo or the drug. The randomised

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[4] For a detailed presentation and discussion of these findings, see pp.28–30 of Barrett et al. (2015).

[5] See Appendix Table A1 where variable definitions are listed.

nature of the trial ensures that the treatment and control groups will not differ on any observable or unobservable variables that might also affect medical outcomes. Bequests and parental transfers are non-randomly distributed across the population because there are personal characteristics that result in some individuals being more likely to receive these intergenerational transfers. For example, a person with a large number of siblings will have lower chances of receiving a parental gift or bequest, *all else being equal.* These characteristics could be correlated with the outcome of interest, such as housing tenure, and hence 'contaminate' comparison of outcomes across a group receiving a bequest (parental transfer) and a group that does not receive a bequest (parental transfer).

The propensity score approach invoked in this chapter imitates a key property of randomised trials by selecting a control group of non-recipients that are statistically equivalent or similar to recipients in respect of key personal characteristics. The goal is to ensure that the control (counterfactual) sample is a replica of the treatment group in terms of its (pre-treatment) observable socio-economic and demographic characteristics. In randomised trials equivalence on observables is accompanied by treatment and control groups that will not also differ with respect to unobservable variables. Thus, if the same attribute transfers to the PSM method, it corrects for any systematic unmeasured differences that mean some individuals are predisposed to receive parental transfers, and where these unmeasured differences are also correlated with home ownership status. Comparisons of housing tenure outcomes between counterfactual and treatment samples can then be attributed to the effect of the 'treatment on the treated'. The PSM method therefore addresses sources of selection bias that a simple tenure choice model does not deal with. In the next section we explain the steps taken in order to execute this research approach.

4.1 Data, methodological issues and sample specification

4.1.1 Methodology

The analysis of home ownership status uses all persons aged 25–65 years with a reported tenure status in 2010. Home ownership is identified by answers to the following HILDA survey question:

> Which household members are the legal owners of the property?

Results for both the 25–65 age group and the younger 25–45 years of age subsample are reported. The two samples reflect differences in the underlying processes of interest in this report. For younger individuals, the effect of bequests is potentially greater given entry into first home ownership generally occurs during this part of the life-cycle. Conversely, it is generally the case that bequests are less common among this set of younger individuals. A further consideration relates to housing tenure patterns that have been identified elsewhere in the literature. While it has been common to assume that once home ownership has been achieved it is secured for the rest of the life cycle, evidence is suggesting that such a presumption is no longer valid in contemporary housing markets (Wood et al. 2013b). Bequests might then help ex-owners return to home ownership.

Though gifts are typically smaller than bequests, they are received earlier in the life cycle when first transitions into home ownership are made. A separate inquiry is conducted into the role of gifts. Analyses of outright ownership status are again conducted on all persons with a reported tenure status in 2010. As with home ownership status, results are reported for both the 25–65 age range as well as the younger 25–45 year subsample, and a separate PSM exercise is conducted for bequests and gifts.

Application of the PSM method proceeds in four steps. The first step requires estimation of a probit model of the probability of receiving a bequest (gift). A rich range of potential recipient socio-economic and demographic variables is augmented by key family characteristics, such as the number of siblings as well as variables representing parental background. The probit

model coefficient estimates play a critical role as they are used to generate the predicted conditional probability of receiving a bequest (gift) for each member of the sample.[6] This conditional probability is commonly referred to as the propensity score. Rather than matching on an individual characteristic, the PSM method uses the propensity score so that matching is achieved on a vector of personal characteristics. The analysis used a series of three matching algorithms.

The *nearest neighbour* algorithm involves matching a member of the group receiving a bequest (gift) with a person who did not receive a bequest, but has an estimated propensity score closest to that of the recipient. The chosen match is returned to the sample and is therefore available as a potential match for each remaining bequest (gift) beneficiary.[7] A second approach, the *radius (with caliper) method*, proceeds with the same matching process as in nearest neighbour, but discards the match if the difference in propensity scores exceeds some limit (the caliper). Controls that fail the caliper threshold are added back and can therefore be chosen as a match for some other recipient of a bequest. The radius method does not use recipients of a bequest that do not have a close neighbour. The third approach is commonly referred to as the kernel matching approach. It departs from the first two algorithms by utilising all observations in the control group to construct the matched control sample, rather than only selecting a subsample of them. It assigns weights to each observation within the control group that are proportional to the distance between the propensity score for non-treated person *i* and treated person *j*; a higher weight is placed on control observations that are nearer to the treatment group in terms of their propensity score, and less weight on those more distant (Caliendo 2005).

Once a matched set of controls has been formed, a series of post-estimation diagnostics are applied. They include t-tests on each characteristic to detect statistically significant differences in the mean values of characteristics between treatment (those inheriting or accepting a gift) and matched control (non-beneficiary) groups, and a standardised bias test (Rosenbaum & Rubin 1985). A standardised bias test indicates the reduction in bias attributable to matching; it is measured by first estimating the standardised residual which is simply the difference in means between the treatment and unmatched control sample for variable x divided by the standard deviation of the pooled sample. The standardised residual is then recalculated for each variable, only this time the numerator is the difference in means in variable x between the treated and *matched* control group while the denominator remains as the standard deviation for the pooled sample. Differences in the standardised residuals between the matched and unmatched samples for each variable offer a measure of the percentage reduction in bias due to matching. As a general rule of thumb, balance in the covariates is achieved when the standardised bias in the matched sample is less than 25 per cent (Rubin 2001). If these balancing tests fail, the probit model is re-estimated using an alternative specification and this process is repeated until the balancing tests are passed. Following this, the average effect of bequests (gifts) on the individuals receiving bequests (gifts) is calculated as the difference between their home ownership rate and the home ownership rate among the matched counterfactual control group. This is commonly referred to as the average treatment effect on the treated.

4.1.2 Data

We begin by describing the key features of the sample used in the PSM analysis (Table 2 below). Approximately two-thirds of the 25–65-year old survey participants were home owners in 2010, a share roughly the same as in the Australian population.[8] The proportion of home owners among the younger group is, as expected, somewhat lower (54%). The difference in

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[6] See Tables A1 and A2 in Appendix for a list of variable definitions and model estimates, respectively.

[7] This procedure is typically referred to as nearest neighbour with replacement.

[8] This figure is similar to that reported in Australian Bureau of Statistics (2013).

mortgagor status is not as large at 43 per cent (25–65-year olds) and 47 per cent (25–45-year old), a pattern that most likely reflects the sharp increase in indebtedness among those approaching retirement in recent times (Wood et al. 2013b). Further, outright ownership is uncommon among the younger age group (7%) as renting is a much more common form of tenure (46%) Around 10 per cent of the 25–65 years of age sample received a bequest between 2002 and 2010, with a large majority receiving just one bequest.[9] Gifts from parents are less commonly received at 5 per cent of all 25–65-year-old survey participants, though such transfers are somewhat more frequent among the younger participants (7.3%). In contrast, bequests reach a lower 6.7 per cent in this younger age group.

Table 2: Descriptive statistics, PSM sample

	Aged 25–65 in 2010		Aged 25–45 in 2010	
	Count	**%**	**Count**	**%**
Bequest recipient, 2002–10[a]	682	9.3	245	6.7
Gift recipient, 2002–10[b,c]	367	5.1	264	7.3
Home owner 2010	4,698	64.3	2,017	54.4
Outright h/owners 2010	*1,537*	*21.1*	*271*	*7.3*
Mortgagor 2010	*3,161*	*43.3*	*1,746*	*47.1*
Renter/living rent free in 2010	2,604	35.7	1,688	45.6
Sample size	7,302		3,705	

Source: Authors' own calculations, wave 1–10 HILDA.

Note: [a] Mean and median amount of bequest received between 2002–10 was $82 444 and $29 000, respectively.

[b] Mean and median amount of parental gifts/transfers received between 2002–10 was $29 382 and $10 500, respectively.

[c] Only includes persons who received a parental gift/transfer amounting to $5000 or more.

4.2 Empirical estimates

4.2.1 Housing pathways and bequests

Table 3 below presents the findings with respect to achievement of home ownership status in 2010. Consider first the 25–65-year old PSM samples. Note that the positive effect found in the positioning paper using a probit model is also identified using the PSM methodology. Using the PSM methodology, the analysis indicates that receipt of a bequest increases home ownership rates *among beneficiaries* by between 4 and 8 percentage points.[10]

Consider first the measured effects obtained from application of the nearest neighbour algorithm. In the group benefiting from a bequest (the 'treatment' rate of home ownership) there is a 73 per cent rate of ownership, compared to 69 per cent in the matched non-beneficiary (control) group. This represents a 4 percentage point difference or 6 per cent of the rate in the matched control group. The rates of ownership in the treatment and matched control group are higher than in the all sample (25–65 years) design. This is because the ownership rates of heirs are boosted by their inheritance, and the control has been chosen such that their observable personal characteristics are statistically indistinguishable. The higher rates of ownership among the matched control suggest that heirs have personal characteristics,

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[9] 85 per cent of bequest recipients received a single bequest between waves 2002–10.

[10] The balancing tests are satisfied using the first round probit model estimates. Tests for balance in the covariates between the treatment and control groups are illustrated in Figure A1 in Appendix. Given space considerations, we only present the balancing estimates for the Radius Matching with Caliper method. Balancing test diagnostics for the nearest neighbour and kernel matching algorithms are available from the authors upon request.

including income and employment, that would make them more likely than the remainder of the 25–65-year sample to become home owners even in the absence of a bequest.

Alternative matching algorithms offer estimates of a similar order of magnitude, though somewhat larger, and also statistically significant (in contrast with the nearest neighbour difference in ownership rates which is insignificant). A larger impact is also found for the younger age group (25–45 years of age) where first transitions into home ownership are typically made. This is despite the lower incidence of bequests among the young (7% of the 25–45-year group receive bequests, but 12% do so in the 45–65 year group). It is also possible that the average size of any bequest differs among these groups. Home ownership rates among beneficiaries are increased by 7 percentage points (13%) from 53 per cent to 60 per cent using the nearest neighbour algorithm, and similar though slightly smaller effects are detected using alternative algorithms, and again the differences using alternative algorithms are statistically significant. The larger effect among the young reflects a higher propensity to inherit while still renting or living in the parental home. In the older age cohort bequests are more likely to be received after making a transition into home ownership. This conjecture is strongly supported by the HILDA data; a little over three-quarters (77%) of 45–65-year old beneficiaries were already home owners, and this age group more frequently receive bequests anyway. Even in the younger 25–45-year age group, nearly one-half (47%) were home owners before inheritance.

Table 3: Difference between bequest recipients and non-recipients in home ownership status in 2010

Matching algorithm	Treatment-rate of h/ship	Control-rate of h/ship	Effect of bequest on treated	Treatment-rate of h/ship	Control-rate of h/ship	Effect of bequest on treated
	Aged 25–65 year			Aged 25–45 years		
Nearest neighbour	73.3%	69.2%	4.1% (1.58)	59.8%	52.8%	7.1% (1.52)
Radius	73.3%	66.7%	6.6% (3.57)	59.8%	51.5%	8.3% (2.48)
Kernel	73.3%	65.7%	7.6% (4.19)	59.8%	52.2%	7.7% (2.37)

Source: Authors' own calculations, wave 1–10 HILDA. t-stats reported in brackets.

Bequests and their possible effects on pathways into mainstream or outright ownership are presented in Table 4 below. We might expect home buyers receiving a bequest after a first move into home ownership to use at least some of their windfall to pay down mortgages and accelerate transitions into mainstream ownership. The (nearest neighbour) findings offer compelling evidence in support of this hypothesis. Among the non-beneficiary controls aged 25–65 years, mainstream ownership is reached by only 23 per cent; in comparison 33 per cent of bequest recipients no longer had an outstanding mortgage in 2010. The 10 percentage point difference is equivalent to a 43 per cent increase when calculated with respect to the control rate of outright ownership. Since bequests are less likely among the 25–45 years cohort, and outstanding mortgages are generally larger, the acceleration into mainstream ownership due to inheritances is less pronounced with a 6 percentage point difference, though this is from a lower base of just 6 per cent in the matched control group and therefore represents a doubling of the rate in the control group.[11]

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[11] Findings are again similar using the other algorithms.

Table 4: Difference between bequest recipients and non-recipients in home ownership status in 2010

Matching algorithm	Treatment-rate of h/ship	Control-rate of h/ship	Effect of bequest on treated	Treatment-rate of h/ship	Control-rate of h/ship	Effect of bequest on treated
	Aged 25–65 year			**Aged 25–45 years**		
Nearest neighbour	32.6%	22.7%	9.8% (7.77)	11.0%	5.5%	5.5% (2.13)
Radius	32.5%	23.3%	9.1% (4.84)	11.0%	5.9%	5.1% (2.46)
Kernel	32.6%	21.9%	10.7% (5.69)	11.0%	6.4%	4.6% (2.28)

Source: Authors' own calculations, wave 1–10 HILDA. t-stats reported in brackets.

4.2.2 Housing pathways and parental transfers

The median parental transfer of $10 500 is significantly smaller than the median bequest ($29 000); and only 6 per cent of the sample received gifts compared to approximately 8 per cent that reported the receipt of a bequest. These statistics suggest that gifts will have more limited impacts compared to bequests. However, it is also true that gifts are likely to be timed to coincide with specific needs of children, including around home ownership decisions. The summary statistics indicate that parental transfers are marginally more common among the young 25–45 age group (7%). This stage in the life cycle is commonly associated with first transitions into home ownership.

Table 5 below presents evidence around the possible impacts on home ownership status employing the sample of 25–65 year old individuals with a reported tenure status in 2010.[12] Consider the findings obtained using the nearest neighbour method. In the 25–65 year age group the rate of home ownership is 53 per cent in the matched control and 67 per cent in the 'treatment' group that receive gifts. The 14 percentage point increase is large—representing a 26 per cent increase evaluated at the matched control's ownership rate. Estimates are similar when using alternative algorithms.[13]

These impacts of the 'treatment on the treated' are larger than those found for bequests using the same PSM methods. Interestingly, the 53 per cent ownership rate in the matched control group is lower than the 64 per cent ownership rate in the full sample. This indicates that recipients of gifts have personal characteristics that leave them less likely to signal home ownership status than the rest of the sample—a pattern that is the opposite of that found among bequest recipients.

The percentage point increase in the younger cohort is somewhat higher than that in the full sample, and it comes off a lower base. Using the nearest neighbour estimates, the 60 per cent home ownership rate among those reporting the receipt of a parental transfer is 15 percentage points higher than the 44 per cent rate in the matched control, a 34 per cent proportionate increase as measured with respect to the matched control.

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[12] See Appendix Table A3 for probit regression estimates used to estimate the propensity score for parental transfer recipients

[13] Appendix Figure A2 illustrates the performance of the Radius Matching with Caliper based on the standardised bias test

Table 5: Difference between gift recipients and non-recipients in home ownership status in 2010

Matching algorithm	Treatment-rate of h/ship	Control-rate of h/ship	Effect of gift on treated	Treatment-rate of h/ship	Control-rate of h/ship	Effect of gift on treated
	Aged 25–65 year			Aged 25–45 years		
Nearest neighbour	66.5%	52.9%	13.6% (3.85)	59.5%	44.3%	15.2% (3.26)
Radius	66.4%	52.1%	14.3% (5.22)	59.8%	45.6%	14.2% (4.08)
Kernel	66.5%	53.7%	12.8% (4.85)	59.5%	44.8%	14.6% (4.39)

Source: Authors' own calculations, wave 1–10 HILDA. t-stats reported in brackets.

Note: Only includes persons who received a parental gift/transfer amounting to $5000 or more.

While gifts can make a substantial contribution to the deposit required on home purchase, and therefore relax borrowing constraints, their relatively small value is likely to have a more modest effect on paying down outstanding mortgages when compared to bequests. This is especially so for the 25–45-year age group, where any outstanding mortgage is likely to be large. In Table 6 below we consider how gifts are related to transition into outright ownership. Each of the matching algorithms yields estimates of the percentage point increase in rates of outright ownership, which vary between 3 and 6 percentage points for the 25–65 years cohort; this is around a third of the effect on bequest recipients with mortgages. Transfers also accelerate transitions into the mainstream for the young age group by between 4 and 5 percentage points.

Table 6: Difference between parental gift* recipients and non-recipients in outright home ownership status in 2010

Matching algorithm	Treatment-rate of h/ship	Control-rate of h/ship	Effect of gift on treated	Treatment-rate of h/ship	Control-rate of h/ship	Effect of gift on treated
	Aged 25–65 year			Aged 25–45 years		
Nearest neighbour	15.8%	11.4%	4.4% (1.59)	8.3%	3.4%	4.9% (2.29)
Radius	15.7%	10.1%	5.6% (2.59)	8.4%	4.1%	4.3% (2.23)
Kernel	15.8%	12.5%	3.3% (1.61)	8.3%	4.5%	3.8% (2.06)

Source: Authors' own calculations, wave 1–10 HILDA. t-stats reported in brackets.

Note: Only includes persons who received a parental gift/transfer amounting to $5000 or more.

The PSM methodology provides what is arguably a more robust identification of the relationship between intergenerational transfers and housing outcomes than was presented in the accompanying Positioning Paper for this study. Nonetheless, the results are consistent with the results presented in that earlier report. With respect to bequests, we find a statistically significant relationship between the receipt of a bequest and home ownership in the order of between 4 and 8 percentage points. This effect is more pronounced for the younger cohorts (aged 25–45 years) where those receiving a bequest exhibit higher home ownership rates of around 8 percentage points. A key benefit of the PSM methodology is that it allows the

matched control and treatment groups compared to the full sample. This comparison suggests that bequest recipients are more likely to attain home ownership than the rest of the population regardless of the receipt of a bequest.

Given that bequests are often received later in an individual's (or household's) housing career, it is likely that such transfers will impact on the attainment of outright home ownership. The PSM results indicate that a typical inheritance lifts the rate of outright ownership among all beneficiaries by between 9 and 11 percentage points. The effect for younger beneficiaries is somewhat smaller, between 5 and 6 percentage points.

The findings from an examination of the impact of parental transfers are somewhat more nuanced. Significantly, notwithstanding that gifts are generally smaller than bequests, the receipt of a relatively large gift (>$5000) is associated with an increase in rates of home ownership (among those receiving gifts) of 13 to 15 percentage points. Moreover, if they had not received a gift recipients would be less inclined or able to attain home ownership than the rest of the population. Intergenerational transfers of this kind are therefore more likely to reach those on the margins of ownership. Further, parental transfers have a statistically significant effect on outright ownership status, though this effect is somewhat smaller than that experienced by bequest beneficiaries.

5 FIRST HOME OWNERSHIP AND INTERGENERATIONAL TRANSFERS

In this chapter, the analysis considers the impact of intergenerational transfers on the behaviours of first-time home buyers. This group represents a key constituency who have faced an increasingly challenging set of circumstances in housing markets. Notwithstanding that interest rates are currently at historically low levels, rapid increases in prices have been identified as being a barrier to those households who wish to enter the housing market for the first time, especially in inner city markets in Sydney and Melbourne.

As discussed in Chapter 2, the importance of first-time buyers is reflected in the range of policy initiatives designed to facilitate entry into the housing market. The analysis presents novel results on the relationship between intergenerational transfers and housing-related outcomes for this group. Two substantive pieces of analysis are reported. The first extends the work presented in the Positioning Paper (Barrett et al. 2015). Recall that the transition analysis presented in the Positioning Paper identified the conditional probability that individuals change tenure around the time that bequests are received. In doing so, the analysis exploited the panel nature of the HILDA data. The evidence in that paper indicated that households that received bequests were more likely to transition into home ownership. The duration analysis discussed in Section 5.1 generalises this approach to identify how the time until entry into first home ownership is related to the receipt of intergenerational transfers over the period covered by the HILDA data.

The second analysis examines decisions around home purchase for those who enter into home ownership. In particular, using the detailed information available in HILDA it uses regression analysis to identify the relationship between the magnitude of housing loans and the house purchase price for first-time buyers, and intergenerational transfers. The regression analysis is similar to that presented in Engelhardt and Mayer (1998). Together, the analyses provide insight into the different dimensions along which housing-related outcomes may be affected by transfers for first-time buyers.

5.1 Empirical analyses

5.1.1 Duration models

The panel nature of the HILDA dataset provides an opportunity to analyse the dynamic nature of behaviour and outcomes. In Barrett et al. (2015) the transition from one 'state' to another over time was considered using transition matrices. In particular, the conditional probability of transition from one state (e.g. rental tenure) into an alternative state (e.g. home ownership) was considered. That is, the process of interest compared the following:

$$\Pr\left(S_{i,t}, S_{i,t+1} \middle| T_{i,t}\right)$$

Where $S_{i,t}$ is the tenure status in period t for household i and $T_{i,t}$ identifies if the household received a transfer $\left(T_{i,t} = 1\right)$ or not $\left(T_{i,t} = 0\right)$. Hence, the probability of transitioning into an alternative tenure status, conditional on the initial tenure status, was examined.

The duration analysis presented in this chapter generalises this approach and is similar to that presented in Guiso and Japelli (2002). In that paper, the time or duration until entry into home ownership was analysed. Alternatively, the process in that paper was characterised as an analysis of the effect of transfers on the time spent saving before entering into home ownership. The analysis in this chapter focuses on economic agents that have not previously entered into home ownership and considers the time until a transition into first home ownership

occurs.[14] Of key interest is how the transition into first home ownership is affected by the receipt and or value of an intergenerational transfer such as a bequest or parental gift.

The transition from one state (e.g. rental tenure) into another state (e.g. home ownership) is often modelled using the hazard rate. The hazard rate methodology can be conceptualised by considering a group of households that have not yet entered into home ownership. Each of these households can be considered 'at risk' of transitioning into another state, namely home ownership. Consider a period such as one year. The hazard rate is the proportion of those households which at the start of each year have not entered into first-time home ownership but do so by the end of the year. The hazard rate is a conditional probability—that is, it is the proportion of households (or individuals) which transition into first-time ownership *conditional* on being eligible to experience first-time home ownership. Intuitively, the hazard rate lies between 0 and 1, with a higher hazard rate indicating that the conditional probability of transitioning into home ownership is greater.

When a set of households or individuals is observed for an extended duration, it is possible to identify how the hazard rate changes over time. Again, consider a set of economic agents (households or individuals) at risk of entering into first home ownership. In some cases, observations will not be observed to enter into first home ownership. This may be because the data collection period ends prior to transition into the state of interest (first home ownership) or because the observation attrites out of the sample prior to the end of the data collection period. In this case, the observation is said to be censored.

In waves 6 and 10 of the HILDA data it is possible to identify households that have not previously purchased a home or have done so for the first time since the HILDA was initially collected in 2001. It is the transition of these households into first-time home ownership that is analysed using duration models. In effect, the hazard or conditional transition into home ownership is estimated using econometric techniques that control for observable characteristics of the household including the disposable income of the household, the location of the household, and the receipt of intergenerational transfers.

There are a variety of ways in which hazard rates can be modelled from a statistical or econometric perspective. Some approaches impose specific functional forms on the hazard rate so that it is always increasing or decreasing. The approach adopted in this chapter is one that provides maximum flexibility in the shape of the hazard function. In particular, a proportional hazard model similar to that described in Meyer (1990) and discussed in Lancaster (1990, pp.172–208) is estimated to describe the time until the household enters home ownership for the first-time. The form of this hazard function is as follows:

$$h_n(\tau) = h_0(\tau) \exp\{z_n(\tau)'\beta\}$$

where $h_n(\tau)$ is the hazard rate for individual (or household) n, $h_0(\tau)$ is the 'baseline' hazard common to all individuals (households), $z_n(\tau)$ is a vector of observable characteristics that may vary with time, and β is a vector of parameters to be estimated.

Importantly, duration models such as this allow for the incorporation of non-time varying and time-varying covariates which may shift the hazard rate. An example of a non-time varying covariate in the case of a household may be the gender of the head of the household. Time-varying covariates, as their name suggest, may vary over time and could include the receipt (or value) of a gift or bequest among other things.

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[14] The analysis is undertaken for all individuals, for those individuals who remain single or unpartnered during the period of analysis, and for couple households. The alternative specifications reflect the likelihood that home ownership decisions are often made jointly by individuals within a household setting. Reference to household or individual should be taken to mean both types of economic agents.

5.1.2 Regression models

The duration analysis discussed above focuses on the timing of entry into home ownership. Intuitively, intergenerational transfers may also affect other aspects of the home ownership decision. For example, recipients of transfers may increase the size of the down payment or deposit available for the purchase of a home, and in doing so increase the total purchase price or decrease the size of the housing loan taken out. In an approach similar to that reported in Engelhardt and Mayer (1998), the second analysis in this chapter will consider these two additional aspects of the behaviour of first-time home buyers. The first considers how the purchase price of housing varies according to the receipt and value of intergenerational transfers. Second, regression models that capture the value of the housing loan taken out by first-time buyers are also estimated.

The analysis is this context is a reduced form in character and care should be applied when interpreting the regression results as capturing a causal relationship. Rather, they should simply be interpreted as identifying the conditional means of the variables of interest. That is, the value of the loan taken out and the price of the property purchased.

There are two reasons why the results should be treated carefully. The first relates to the nature of the sample that is used in the analysis. This is described in more detail in Section 5.2, but it is important to emphasise that data limitations associated with the HILDA dataset mean that it is only a small group of first-time home buyers whose decisions can be analysed. Hence, it will not be possible to readily generalise the results from the regression analysis. The second reason reflects the complex nature of the decisions being considered. Decisions around savings and housing expenditures are complex and require the needs of the household or individual to be considered in a life-cycle context. As noted in Chapter 2, it is likely to be important whether the transfer is expected as behavioural responses may differ for anticipated and unanticipated transfers. To assign a causal interpretation to the regression estimates would most likely require a more complex methodology that considered the nature of economic decisions over the life-cycle and additional information about the transfers that are analysed. Notwithstanding these limitations, the analysis provides the first insight into how the financial aspects of home purchase may be related to intergenerational transfers from an Australian perspective.

5.2 Data, methodological issues and sample specification

5.2.1 Duration models

Prior to presenting the results from the duration or hazard rates models, it is important that a number of methodological and data issues are discussed.

Duration or hazard rate modelling requires information about the time spent in particular states. A state here can be thought of as a period of time spent in a tenure such as renting or co-residence with parents. The HILDA data provides the opportunity to undertake such analysis because its longitudinal or panel nature means that individuals and households are interviewed repeatedly over time. Moreover, the rich set of covariates available in HILDA means that it is possible to identify the impact of a variety of observable characteristics on transitions into home ownership.

A key consideration when undertaking duration analysis is the problem of length-biased sampling. To understand why this is potentially a problem, consider a set of individuals who we are interested in identifying their transition or hazard into home ownership. [15] For example, in the HILDA sample all individuals are interviewed for the first time in 2001. This provides a stock or set of individuals whose tenure status can be measured at that date. Individuals who are not

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[15] The discussion here relates to individuals though clearly it could apply to households were they the unit of observation.

in home ownership in 2001 will be 'at risk' of entering into that tenure status (home ownership) in the future. A key problem that often arises in duration analysis is that for a 'stock' sample, such as the set of individuals interviewed in HILDA for the first time in 2001, it will not always be possible to identify how long individuals have been in their initial state. It is well recognised in the duration modelling literature that in such a stock sample, individuals who have been in a particular state (non-home ownership) for an extended period of time will be more likely to appear in the sample. Moreover, such individuals might, because of unobservable characteristics, be more likely to remain in the non-ownership state in the future. Inclusion of such individuals in any analysis will likely lead to biased estimates from duration estimates.

The problem of length-biased sampling is avoided in HILDA by focusing on individuals who have not previously owned housing. It is possible to do so because in waves 6 and 10 of the HILDA survey individuals are asked:

Do you currently own OR have you ever owned a residential property?

At what age did you first acquire, or start buying, a residential property?

Hence it *is* possible to define a set of individuals who, in the first wave of HILDA (and waves 6 and 10), had not yet entered into home ownership. Moreover, given information about age, it is possible to identify how long they have been in that state. This information allows the problem of length-biased sampling to be avoided as full information about how long an individual has in fact been in the 'non-ownership' state can be inferred.

The second issue to note around the duration models is the unit of analysis. Decisions around housing, for example, are generally considered to be made at the household or income unit level. The covariate of interest in this study, however, is an intergenerational transfer or bequest that is reported and received at the individual level. To address this, the duration models are estimated using a number of different samples. In the first instance, the time to first home ownership is modelled at the individual level. Such an approach means that members of a couple are separate observations in the sample and both will likely report transition into home ownership simultaneously. While it is possible to control for marital status, the receipt of an intergenerational transfer is reported at the individual level and it is likely to be reported for only one member of the couple notwithstanding its impact on the joint decision around home ownership. To address this concern, the duration models are estimated with two alternative 'units of observation'. First, duration models are estimated for individuals who remain unpartnered throughout the period of analysis. That is, a sample of individuals who remain single is analysed. Second duration models are estimated for couples, where those couples remain partnered throughout the period of analysis. In the latter case, if either member of the couple receives a transfer or bequest then it is attributed to the 'couple'. For the sample of couples, it is simply assumed that the male represents the head of the household and the characteristics of the couple such as age and education are represented by the characteristics of the male.

The number of spells for each of the samples is set out in Table 7 below along with some characteristics of those spells. The number of spells for individuals considered separately is, as expected, greater than that for the sample of singles and couples. As expected, fewer spells among the couples are censored, that is, observation of the spell is completed prior to the unit of observation being observed to transition into home ownership for the first time. It has been noted in the literature previously that marriage or partnering is an important determinant of transitions into home ownership, and in general it might be expected that couple households are more likely to transition into home ownership than other types of households (Hendershott et al. 2009). The proportion of couples that receive a bequest is higher (7.7%) compared to those individuals who remain single throughout the sample period (3.5%). Recall, however, that for couples a transfer may be received by either member of the household and attributed to that household. Interestingly, couple households receive fewer parental transfers than the

other groups, though the amount transferred tends to be higher ($12 774) than that received by all individuals ($8250) or singles ($6040).

Table 7: Spells prior to first home ownership

	Individuals	Singles	Couples
No spells	5,584	3,508	776
Proportion censored spells	0.643	0.875	0.595
Proportion females	0.528	0.505	-
% spells in which bequest received	0.049	0.035	0.077
Value bequest if received ($)	$47,731	$40,185	$94947
% spells in which transfer received	0.254	0.306	0.173
% spells in which parental transfer >$5000 received	0.052	0.052	0.052
Total value transfers if received ($)	$8,250	$6,040	$12,774

Source: Authors' own calculations using HILDA data, waves 1–13.

5.2.2 Regression models

The regression models also focus on the behaviours of first-time home owners. In particular, the value of the home purchased and the value of the loan taken out to finance the home purchase. The analysis is, however, more limited by data considerations than the duration analysis. In particular, individuals are only asked about the value of the loan taken out in waves 6 and 10 of the HILDA data. Moreover, the question relates only to the current home that is occupied as an owner-occupier. In some cases, individuals had purchased a home as a first-time buyer and subsequently returned to rental tenure or purchased a second home by the time of the interview in waves 6 and 10. Further, for those individuals who entered into home ownership for the first time after wave 10, it was not possible to conclusively identify the value of the loan taken out for the purpose of purchasing an owner-occupied dwelling.

These data constraints mean that the analysis is restricted to a set of respondents in waves 6 (or 10) of HILDA who had purchased their first home prior to wave 6 (10) and remained in that dwelling until waves 6 (10). The regressions are undertaken for individuals only and characteristics of the sample are shown in Table 8 below. Note that separate means are shown for those individuals who do (and do not) receive a bequest or transfer two years prior to the purchase of their first home. The number of individuals who receive a bequest is relatively small (38) and the regression results presented in Section 5.3 should be interpreted with that limitation in mind.

Table 8: Summary statistics, regression analysis

	No bequest received	Bequest received	No transfer received	Transfer received
Age (years)	31.089	34.474	31.649	28.112
New South Wales	0.289	0.316	0.292	0.276
Victoria	0.225	0.342	0.225	0.267
Queensland	0.228	0.158	0.232	0.181
South Australia	0.095	0.079	0.091	0.121
Western Australia	0.085	0.053	0.089	0.052
Tasmania/ ACT NT	0.077	0.053	0.072	0.103
Completed HS	0.188	0.184	0.191	0.164
Post HS qualification	0.182	0.105	0.171	0.233
Undergraduate degree	0.225	0.263	0.216	0.302
Postgraduate degree	0.091	0.158	0.089	0.129
Dis/able inc. ($0,000s)	3.788	5.670	3.857	3.898
Received bequest	0.000	1.000	0.040	0.034
Amt bequest ($0,000s)	0.000	6.625	0.203	0.691
Recd parental transfer	0.121	0.105	0.000	1.000
Amt transfer ($0,000s)	0.178	0.387	0.000	1.473
House price ($0,000s)	31.104	38.782	30.858	35.417
Housing loan ($0,000s)	22.983	21.363	22.458	26.274
No observations	924	38	846	116

Source: Authors' own calculations using HILDA data, waves 1–10.

As expected, those individuals who receive a bequest tend to be somewhat older (34.5 years) compared to those who do not receive a bequest (31.1 years). In comparison, those who receive a transfer are younger than those who do not (28.1 years and 31.6 years respectively). Of particular interest are the size of the home loan and the value of the house which is purchased. Among those who receive a bequest, the purchase price is somewhat higher compared to those who do not receive a bequest ($387 000 and $310 000 respectively), while the value of the home loan taken out is similar ($213 000 and $230 000 respectively). Among those who report receiving a transfer from parents, the purchase price and loan value are higher ($354 000 and $262 000 respectively) compared to those who do not report receiving a parental transfer ($308 000 and $224 000 respectively).

5.3 Empirical estimates

5.3.1 Duration models

The results from the duration models are presented in Tables 9 to 14 below. The results reported are those for the set of individuals (or couples) aged less than 65 years of age. This age corresponds with entry into retirement for most individuals and it is likely that if the initial transition home ownership has not occurred by that age it is unlikely to occur. Alternative specifications that consider only those individuals aged less than 45 years of age and those that include all individuals are also estimated with similar results to those in Tables 9 to 14.[16]

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[16] These results are available on request.

Results are presented separately for all individuals (Tables 9 and 12), those who remain singles prior to censoring or entering into home ownership (Tables 10 and 13) and couple households (Tables 11 and 14). A series of models are estimated for each sample that measures the receipt of a bequest or a parental transfer differently. In particular, estimates from models that incorporate indicator variables that capture the receipt of a bequest in the current or previous periods, the value of bequests received along with the receipt of a large bequest (>$10 000) are reported. In each case, the receipt or value of the bequest is a time varying covariate which takes on positive values only in those periods where the bequest is received. A similar set of specifications are presented for parental transfers. In the case of couples, the receipt and amount of a bequest or transfer considers both individuals in the couple household.

The duration models can be interpreted by considering what effect the covariate of interest has on the hazard or transition into first home ownership. The underlying or baseline hazard is not reported. Rather, the coefficients indicate how the baseline hazard is moved, in a proportional sense, by the coefficient of interest. For example, in column (1) of Table 9 the coefficient on the '*Received bequest*' variable indicates that the receipt of a bequest shifts up the baseline hazard by approximately 97 per cent, *ceteris paribus*.[17] That is, it effectively doubles the hazard or the conditional probability of transitioning into first home ownership. In comparison, being married more than triples the baseline hazard or the conditional probability of transitioning into first home ownership, *ceteris paribus*. The large effect of being married has been noted in other research such as Hendershott et al. (2009).

In general, the results of the duration models are consistent with *a priori* expectations. The results for all individuals are reported in Table 9 below. As expected, there is a clear life-cycle pattern associated with the hazard into first home ownership which peaks at ages 25–34 years. Similarly, the hazard into first home ownership is increasing in education levels. Education levels here could be interpreted as a proxy for permanent income and similar patterns are observed in the results reported in Tables 10 and 11 below.

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[17] The effect on the baseline hazard can be calculated as follows, $e^{\beta x}$. Hence, $e^{0.638} = 1.97$, indicating that the receipt of a bequest shifts the baseline hazard up by a factor of 1.97 or 97 per cent.

Table 9: Duration model estimates, all individuals (bequests)

	(1)	(2)	(3)	(4)	(5)
Female	0.106**	0.149***	0.107**	0.105**	0.149***
	(0.0468)	(0.0525)	(0.0468)	(0.0468)	(0.0525)
Age 25–34 years	0.432***	0.393***	0.432***	0.428***	0.392***
	(0.0572)	(0.0648)	(0.0572)	(0.0572)	(0.0648)
Age 35–44 years	0.108	0.0780	0.108	0.106	0.0772
	(0.0747)	(0.0833)	(0.0747)	(0.0747)	(0.0833)
Age 45–54 years	-0.0973	-0.167	-0.0914	-0.103	-0.168
	(0.105)	(0.116)	(0.104)	(0.105)	(0.116)
Age 55–64 years	0.119	0.168	0.123	0.115	0.166
	(0.135)	(0.141)	(0.135)	(0.135)	(0.141)
New South Wales	-0.0989	-0.166	-0.105	-0.0983	-0.165
	(0.0985)	(0.106)	(0.0985)	(0.0985)	(0.106)
Victoria	-0.130	-0.244**	-0.138	-0.130	-0.244**
	(0.101)	(0.110)	(0.101)	(0.101)	(0.110)
Queensland	-0.0621	-0.144	-0.0673	-0.0630	-0.145
	(0.101)	(0.109)	(0.101)	(0.101)	(0.109)
South Australia	-0.0929	-0.176	-0.0899	-0.0877	-0.173
	(0.117)	(0.128)	(0.117)	(0.117)	(0.128)
Western Australia	0.243**	0.159	0.230**	0.241**	0.159
	(0.113)	(0.124)	(0.113)	(0.113)	(0.124)
Completed HS	-0.0109	0.0250	-0.00585	-0.0123	0.0242
	(0.0681)	(0.0765)	(0.0681)	(0.0681)	(0.0765)
Post HS qual.	0.343***	0.311***	0.350***	0.344***	0.311***
	(0.0678)	(0.0764)	(0.0678)	(0.0678)	(0.0764)
Undergraduate	0.489***	0.501***	0.489***	0.490***	0.501***
	(0.0640)	(0.0717)	(0.0640)	(0.0640)	(0.0717)
Postgraduate	0.483***	0.546***	0.494***	0.486***	0.545***
	(0.0853)	(0.0937)	(0.0852)	(0.0853)	(0.0937)
Dis. Inc. ($000s)	0.146***	0.139***	0.146***	0.146***	0.139***
	(0.00705)	(0.00773)	(0.00705)	(0.00706)	(0.00773)
Married	1.240***	1.174***	1.238***	1.239***	1.174***
	(0.0522)	(0.0572)	(0.0522)	(0.0522)	(0.0572)
Received bequest	0.683***	-	-	-	-
	(0.156)				
Received bequest (t-1)	-	0.199	-	-	-
		(0.226)			
Amount bequest ($000s)	-	-	0.00456***	-	-
			(0.000937)		
Received lge bequest	-	-	-	0.979***	-
				(0.179)	
Received Large bequest (t-1)	-	-	-	-	0.460
					(0.280)
Log likelihood	-6724.43	-5508.04	-6723.23	-6720.92	-5507.24
No. observations	32,560	27,124	32,560	32,560	27,124

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Table 10: Duration model estimates, singles (bequests)

	(1)	(2)	(3)	(4)	(5)
Female	-0.0527	-0.0190	-0.0570	-0.0533	-0.0197
	(0.0991)	(0.111)	(0.0993)	(0.0991)	(0.111)
Age 25–34 years	0.572***	0.495***	0.572***	0.578***	0.496***
	(0.125)	(0.140)	(0.125)	(0.125)	(0.140)
Age 35–44 years	0.438***	0.249	0.432***	0.441***	0.249
	(0.157)	(0.180)	(0.157)	(0.157)	(0.180)
Age 45–54 years	0.484**	0.291	0.476**	0.484**	0.290
	(0.194)	(0.219)	(0.194)	(0.194)	(0.219)
Age 55–64 years	0.910***	0.893***	0.909***	0.901***	0.894***
	(0.237)	(0.250)	(0.237)	(0.237)	(0.250)
New South Wales	0.0644	0.328	0.0475	0.0454	0.326
	(0.235)	(0.284)	(0.236)	(0.236)	(0.284)
Victoria	0.173	0.340	0.161	0.161	0.340
	(0.240)	(0.291)	(0.241)	(0.240)	(0.291)
Queensland	0.283	0.415	0.267	0.267	0.413
	(0.243)	(0.295)	(0.243)	(0.243)	(0.295)
South Australia	0.353	0.569*	0.343	0.337	0.569*
	(0.267)	(0.319)	(0.267)	(0.267)	(0.319)
Western Australia	0.346	0.606*	0.329	0.327	0.604*
	(0.267)	(0.315)	(0.267)	(0.267)	(0.315)
Completed HS	-0.358**	-0.326**	-0.369**	-0.356**	-0.325**
	(0.144)	(0.162)	(0.145)	(0.144)	(0.162)
Post HS qual.	0.351**	0.271	0.353**	0.354**	0.272
	(0.152)	(0.171)	(0.152)	(0.152)	(0.171)
Undergraduate	0.352**	0.283*	0.359**	0.356**	0.284*
	(0.140)	(0.158)	(0.141)	(0.140)	(0.158)
Postgraduate	0.114	0.191	0.137	0.0976	0.191
	(0.213)	(0.228)	(0.213)	(0.214)	(0.229)
Dis. Inc. ($000s)	0.294***	0.274***	0.294***	0.293***	0.274***
	(0.0217)	(0.0245)	(0.0217)	(0.0217)	(0.0245)
Rcd bequest	0.884***	-	-	-	-
	(0.324)				
Rcd bequest (t-1)	-	0.281	-	-	-
		(0.506)			
Amt beq.t ($000s)	-	-	0.0102***	-	-
			(0.00296)		
Rcd lge bequest	-	-	-	1.294***	-
				(0.363)	
Rcd lge beq. (t-1)	-	-	-	-	0.291
					(0.713)
Log likelihood	-1858.48	-1503.36	-1855.71	-1856.94	-1503.42
No. observations	16,879	13,446	16,879	16,879	13,446

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Table 11: Duration model estimates, couple households (bequests)

	(1)	(2)	(3)	(4)	(5)
Age 25–34 years	0.0396	0.0557	0.0370	0.0384	-0.169
	(0.147)	(0.166)	(0.147)	(0.147)	(0.198)
Age 35–44 years	-0.118	-0.134	-0.120	-0.121	-0.314
	(0.206)	(0.229)	(0.206)	(0.206)	(0.253)
Age 45–54 years	-0.483*	-0.594*	-0.491*	-0.486*	-0.821**
	(0.292)	(0.339)	(0.292)	(0.292)	(0.363)
Age 55–64 years	-1.146**	-0.913*	-1.173**	-1.149**	-1.022**
	(0.481)	(0.495)	(0.485)	(0.482)	(0.505)
New South Wales	-0.0592	-0.310	-0.0608	-0.0577	-0.338
	(0.243)	(0.249)	(0.243)	(0.242)	(0.272)
Victoria	-0.348	-0.610**	-0.348	-0.348	-0.661**
	(0.257)	(0.266)	(0.257)	(0.257)	(0.293)
Queensland	-0.230	-0.464*	-0.226	-0.227	-0.421
	(0.247)	(0.253)	(0.247)	(0.247)	(0.276)
South Australia	-0.213	-0.465	-0.195	-0.199	-0.455
	(0.289)	(0.303)	(0.288)	(0.288)	(0.333)
Western Australia	0.260	-0.136	0.262	0.257	-0.104
	(0.291)	(0.321)	(0.291)	(0.291)	(0.355)
Completed HS	0.184	0.104	0.186	0.186	0.101
	(0.172)	(0.196)	(0.172)	(0.172)	(0.226)
Post HS qual.	0.265	0.261	0.266	0.266	0.206
	(0.163)	(0.181)	(0.163)	(0.163)	(0.208)
Undergraduate	0.385**	0.490***	0.389**	0.390**	0.724***
	(0.170)	(0.183)	(0.170)	(0.169)	(0.203)
Postgraduate	0.302	0.403	0.308	0.307	0.550*
	(0.251)	(0.270)	(0.251)	(0.251)	(0.301)
No. dep. children	-0.213***	-0.206***	-0.214***	-0.214***	-0.169**
	(0.0598)	(0.0658)	(0.0598)	(0.0598)	(0.0689)
Dis. Inc. ($000s)	0.164***	0.161***	0.162***	0.163***	0.147***
	(0.0223)	(0.0230)	(0.0223)	(0.0223)	(0.0242)
Received bequest	0.455	-	-	-	-
	(0.325)				
Received bequest (t-1)	-	0.672*	-	-	-
		(0.366)			
Amount bequest ($000s)	-	-	0.00292	-	-
			(0.00231)		
Received lge bequest	-	-	-	0.470	-
				(0.447)	
Received large bequest (t-1)	-	-	-	-	1.334***
					(0.476)
Log likelihood	-957.37	-799.80	-957.62	-957.75	-657.05
No. observations	3,256	2,835	3,256	3,256	2,524

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Of main interest in the present analysis is the effect of bequests and parental transfers on the transition into first home ownership. In this respect, the evidence suggests that the concurrent receipt of a bequest increases the hazard into first-time home ownership while the receipt of a bequest lagged one period does not do so. For example, focusing on columns 1 and 2 in Table 9 we observe that the coefficient on '*received bequest*' is positive and statistically significant, indicating a positive association between concurrent receipt of a bequest and the hazard into first home ownership. In the case of the bequest received in the previous period (*received bequest (t-1)*), however, the estimated coefficient is statistically insignificant. Intuitively it might have been expected that the receipt of a bequest would have a lagged impact on housing-related transitions. It may be the case, however, that individuals also inherit a property at the same time as the receipt of a bequest is reported. It is not possible with the HILDA data to separately identify such transfers.

An advantage of the HILDA data is that it also contains information on the value of bequests and parental transfers received. The amount of the bequest measured in $000s (column 3, Table 9) is also positive and significant (0.00456). Similarly, the receipt of a large bequest is also positively associated with an increase in the hazard rate into first home ownership (column 4, Table 9).

The results from the samples of individuals who are single throughout the period of analysis (Table 10) and couple households (Table 11) are similar though somewhat more nuanced. In the case of singles, the results are similar to those for all individuals. That is, there is evidence that the receipt of bequests, the amount of a bequest, and the receipt of a large bequest are all positively associated with transition into first home ownership. In each case the estimated coefficients are slightly larger than that for the set of all individuals reported in Table 9.

For couple households (Table 11), the strongest results are associated with the receipt of a large bequest in the previous period. While concurrent receipt of a bequest and the concurrent receipt of large bequests are associated with a higher likelihood that the household transitions into first-time home ownership, the coefficients are not statistically significant. Such a pattern highlights the need for additional analysis, but may simply capture the different decision-making processes in households where agreement is required at the household level for major decisions such as tenure choice following the receipt of a bequest.

The results for the duration models incorporating information about transfers indicate somewhat different patterns (Tables 12 to 14). In general, for the socio-demographic characteristics the results are similar to those discussed above. That is, the hazard into first-time home ownership peaks for the age group 25–34 years, is increasing in education levels and positively related to disposable income.

Again, interest is centred on the effect of the receipt and amount of parental transfers. Here the results are somewhat different to those reported for bequests. Rather than increasing the hazard into first home ownership, there is evidence that receipt of a parental transfer is associated with a *decrease* in the hazard into first-time home ownership (singles and individuals, column 1 Tables 12 and 13 respectively) or, in the case of couples, has no effect (Table 14). This may reflect the fact that many individuals in HILDA report the receipt of a parental transfer each period. In many cases, such transfers appear to be small and unrelated to transitions into home ownership. While it is not possible to identify the reason for the parental transfer in HILDA, when only large transfers are considered (>$5000) there is a clear positive association with the receipt of a parental transfer and the transition into first-time home ownership (column 4, Tables 12 and 14). For singles, however, the effect is only significant for large parental transfers received in the previous period (Table 13).

Table 12: Duration model estimates, all individuals (parental transfers)

	(1)	(2)	(3)	(4)	(5)
Female	0.106**	0.105**	0.148***	0.104**	0.147***
	(0.0468)	(0.0468)	(0.0525)	(0.0468)	(0.0525)
Age 25–34 years	0.416***	0.434***	0.394***	0.442***	0.402***
	(0.0574)	(0.0572)	(0.0648)	(0.0573)	(0.0649)
Age 35–44 years	0.0855	0.111	0.0801	0.122	0.0899
	(0.0750)	(0.0747)	(0.0833)	(0.0749)	(0.0835)
Age 45–54 years	-0.116	-0.0884	-0.164	-0.0774	-0.154
	(0.105)	(0.104)	(0.116)	(0.105)	(0.116)
Age 55–64 years	0.101	0.131	0.172	0.141	0.183
	(0.136)	(0.135)	(0.141)	(0.135)	(0.141)
New South Wales	-0.111	-0.110	-0.169	-0.110	-0.169
	(0.0984)	(0.0985)	(0.106)	(0.0984)	(0.106)
Victoria	-0.134	-0.138	-0.246**	-0.144	-0.251**
	(0.101)	(0.101)	(0.110)	(0.101)	(0.110)
Queensland	-0.0775	-0.0746	-0.146	-0.0739	-0.149
	(0.101)	(0.101)	(0.109)	(0.101)	(0.109)
South Australia	-0.0969	-0.0957	-0.176	-0.0945	-0.175
	(0.117)	(0.117)	(0.128)	(0.117)	(0.128)
Western Australia	0.227**	0.232**	0.156	0.233**	0.156
	(0.113)	(0.113)	(0.124)	(0.113)	(0.124)
Completed HS	0.00747	-0.00396	0.0262	-0.00689	0.0244
	(0.0681)	(0.0681)	(0.0765)	(0.0681)	(0.0765)
Post HS qual.	0.357***	0.347***	0.311***	0.343***	0.309***
	(0.0678)	(0.0678)	(0.0764)	(0.0678)	(0.0765)
Undergraduate	0.507***	0.497***	0.502***	0.491***	0.496***
	(0.0640)	(0.0639)	(0.0716)	(0.0640)	(0.0717)
Postgraduate	0.508***	0.489***	0.545***	0.483***	0.540***
	(0.0853)	(0.0854)	(0.0938)	(0.0854)	(0.0937)
Dis. Inc. ($000s)	0.145***	0.145***	0.139***	0.145***	0.139***
	(0.00707)	(0.00707)	(0.00774)	(0.00707)	(0.00772)
Married	1.235***	1.241***	1.174***	1.240***	1.174***
	(0.0522)	(0.0522)	(0.0572)	(0.0522)	(0.0572)
Recd parental transfer	-0.278***	-	-	-	-
	(0.103)				
Amount parental transfer	-	0.00313**	-	-	-
		(0.00147)			
Amount parental transfer (t-1)	-	-	0.00348	-	-
			(0.00328)		
Large parental transfer	-	-	-	0.510***	-
				(0.151)	
Large parental transfer (t-1)	-	-	-	-	0.467**
					(0.184)
Log likelihood	-6728.36	-6730.66	-5507.84	-6727.38	-5505.59
No. observations	32,560	32,560	27,124	32,560	27,124

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Table 13: Duration model estimates, singles (parental transfers)

	(1)	(2)	(3)	(4)	(5)
Female	-0.0525	-0.0545	-0.0191	-0.0553	-0.0197
	(0.0991)	(0.0992)	(0.111)	(0.0991)	(0.111)
Age 25–34 years	0.544***	0.598***	0.503***	0.588***	0.514***
	(0.125)	(0.125)	(0.140)	(0.125)	(0.141)
Age 35–44 years	0.406***	0.457***	0.256	0.450***	0.268
	(0.157)	(0.157)	(0.181)	(0.157)	(0.181)
Age 45–54 years	0.438**	0.475**	0.292	0.485**	0.306
	(0.194)	(0.195)	(0.219)	(0.194)	(0.219)
Age 55–64 years	0.875***	0.934***	0.902***	0.931***	0.922***
	(0.237)	(0.237)	(0.250)	(0.237)	(0.250)
New South Wales	0.0535	0.0503	0.325	0.0596	0.328
	(0.235)	(0.236)	(0.284)	(0.235)	(0.284)
Victoria	0.171	0.160	0.340	0.166	0.339
	(0.240)	(0.241)	(0.291)	(0.240)	(0.291)
Queensland	0.259	0.270	0.413	0.270	0.413
	(0.243)	(0.243)	(0.295)	(0.243)	(0.295)
South Australia	0.348	0.351	0.568*	0.357	0.568*
	(0.267)	(0.267)	(0.319)	(0.267)	(0.319)
Western Australia	0.324	0.328	0.603*	0.333	0.608*
	(0.267)	(0.267)	(0.315)	(0.267)	(0.315)
Completed HS	-0.325**	-0.345**	-0.324**	-0.352**	-0.333**
	(0.144)	(0.144)	(0.162)	(0.144)	(0.162)
Post HS qual.	0.357**	0.349**	0.269	0.347**	0.266
	(0.152)	(0.152)	(0.172)	(0.152)	(0.172)
Undergraduate	0.370***	0.344**	0.276*	0.346**	0.262*
	(0.141)	(0.141)	(0.158)	(0.141)	(0.158)
Postgraduate	0.157	0.139	0.190	0.124	0.168
	(0.213)	(0.213)	(0.228)	(0.213)	(0.229)
Dis. Inc. ($000s)	0.290***	0.291***	0.274***	0.294***	0.277***
	(0.0218)	(0.0217)	(0.0245)	(0.0216)	(0.0244)
Recd parental transfer	-0.438**	-	-	-	-
	(0.220)				
Amount parental transfer	-	0.0136***	-	-	-
		(0.00385)			
Amount parental transfer (t-1)	-	-	0.0105	-	-
			(0.00979)		
Large parental transfer	-	-	-	0.406	-
				(0.360)	
Large parental transfer (t-1)	-	-	-	-	0.820**
					(0.342)
Log likelihood	-1859.14	-1857.55	-1503.10	-1860.81	-1501.23
No. observations	16,879	16,879	13,446	16,879	13,446

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Table 14: Duration model estimates, couples (parental transfers)

	(1)	(2)	(3)	(4)	(5)
Age 25–34 years	0.0422	0.0411	-0.154	0.0626	0.0683
	(0.147)	(0.147)	(0.197)	(0.148)	(0.166)
Age 35–44 years	-0.119	-0.106	-0.316	-0.0885	-0.126
	(0.207)	(0.206)	(0.253)	(0.207)	(0.230)
Age 45–54 years	-0.490*	-0.475	-0.820**	-0.454	-0.589*
	(0.292)	(0.292)	(0.363)	(0.293)	(0.340)
Age 55–64 years	-1.138**	-1.120**	-1.028**	-1.100**	-0.887*
	(0.482)	(0.481)	(0.506)	(0.482)	(0.495)
New South Wales	-0.0562	-0.0721	-0.344	-0.0781	-0.317
	(0.243)	(0.243)	(0.272)	(0.243)	(0.249)
Victoria	-0.341	-0.345	-0.631**	-0.368	-0.616**
	(0.257)	(0.257)	(0.293)	(0.258)	(0.266)
Queensland	-0.226	-0.228	-0.412	-0.243	-0.464*
	(0.247)	(0.247)	(0.276)	(0.247)	(0.253)
South Australia	-0.196	-0.196	-0.429	-0.224	-0.442
	(0.288)	(0.288)	(0.333)	(0.289)	(0.302)
Western Australia	0.265	0.268	-0.112	0.263	-0.146
	(0.292)	(0.291)	(0.356)	(0.291)	(0.321)
Completed HS	0.192	0.196	0.0996	0.187	0.103
	(0.172)	(0.172)	(0.226)	(0.172)	(0.196)
Post HS qual.	0.268	0.274*	0.218	0.275*	0.272
	(0.163)	(0.163)	(0.208)	(0.163)	(0.181)
Undergraduate	0.393**	0.403**	0.743***	0.391**	0.501***
	(0.170)	(0.169)	(0.202)	(0.169)	(0.183)
Postgraduate	0.305	0.274	0.561*	0.290	0.399
	(0.251)	(0.255)	(0.301)	(0.252)	(0.270)
No dependent child	-0.216***	-0.212***	-0.172**	-0.212***	-0.205***
	(0.0598)	(0.0598)	(0.0688)	(0.0598)	(0.0657)
Dis. Inc. ($000s)	0.163***	0.162***	0.148***	0.163***	0.162***
	(0.0223)	(0.0224)	(0.0242)	(0.0224)	(0.0230)
Recd parental transfer	0.00426	-	-	-	-
	(0.207)				
Amount parental transfer	-	0.0112	-	-	-
		(0.00812)			
Amount parental transfer (t-1)	-	-	0.00250	-	-
			(0.0173)		
Large parental transfer	-	-	-	0.665**	-
				(0.301)	
Amt parental transfer (t-1)	-	-	-	-	0.386
					(0.421)
Log likelihood	-958.23	-956.45	-659.86	-956.20	-800.82
No. observations	3,256	3,256	2,524	3,256	2,835

Source: Own calculations using waves 1–13 of HILDA. *** means significance at 1 per cent level, ** significance at 5 per cent level and * at 10 per cent level.

Further evidence about the size of the parental transfer being important is the clear positive association between the amount of the parental transfer and the hazard into home ownership for all individuals and singles (column 2, Tables 12 and 13). For couple households, it is only the receipt of a large concurrent parental transfer which is positively associated with the transition into first home ownership (column 4, Table 14). Evidence from other countries suggests that large transfers are often associated with the purchase of a home and this result would be consistent with such a pattern.

The results of the duration analysis clearly suggest that the receipt of an intergenerational transfer, either in the form of a gift from parents or a bequest, are associated with a higher likelihood of transition into first home ownership. It is also true; however, that the relationship is dependent on the nature of the transfer and the household type or unit of observation being considered. In terms of the 'nature' of the transfer, it is likely that the motives underlying the transfer are also important for understanding its impact on the transition into first home ownership. At present, HILDA does not contain details about the motivation of the giver or the intended purpose of the transfer.

5.3.2 Survivor functions

The duration analysis provides some insight into how the concurrent or recent receipt of a transfer impacts on the hazard into first home ownership. An alternative graphical way to represent the same process is to consider the survivor function. This shows the probability that a non-home owner will 'survive' or remain in non-home ownership past year j of a spell. At the 'commencement of time' all individuals (or households) survive as no-one has entered ownership and so the value of the survivor function is one. As moves into home ownership occur for the first time, the survivor function declines toward its lower bound value of zero; unlike the hazard function, the survivor function will never increase.

The survivor function for each of the three groups considered are presented in Figures 3 to 5 below. In each case, survivor functions are presented for those who do and do not receive a transfer or bequest. For example, in Figure 3 we present the survivor function for all individuals, where the sample is broken down into those who receive a parental transfer and those who do not receive a parental transfer. The receipt of a transfer is presented separately for all transfers and the receipt of a large transfer. In each case, 95 per cent confidence intervals around the survivor functions are also displayed.

The survivor functions are largely consistent with the results from the duration models. In general, the survivor function for those who receive a transfer, either in the form of a bequest or a parental transfer, lie below those who do not. This can be interpreted as meaning those individuals who do not receive a transfer are less likely to exit into first-time home ownership. Indeed, this is the same pattern that was identified, in general, in the duration models. It is not the case, however, that the survivor functions are always statistically different from one another. The differences are most pronounced in the case of bequests and large parental transfers. In some instances, it would appear that the relatively small number of observations that receive a transfer in any given period means that the survivor functions are not statistically different at all time periods.

Figure 3: Survivor function, all individuals
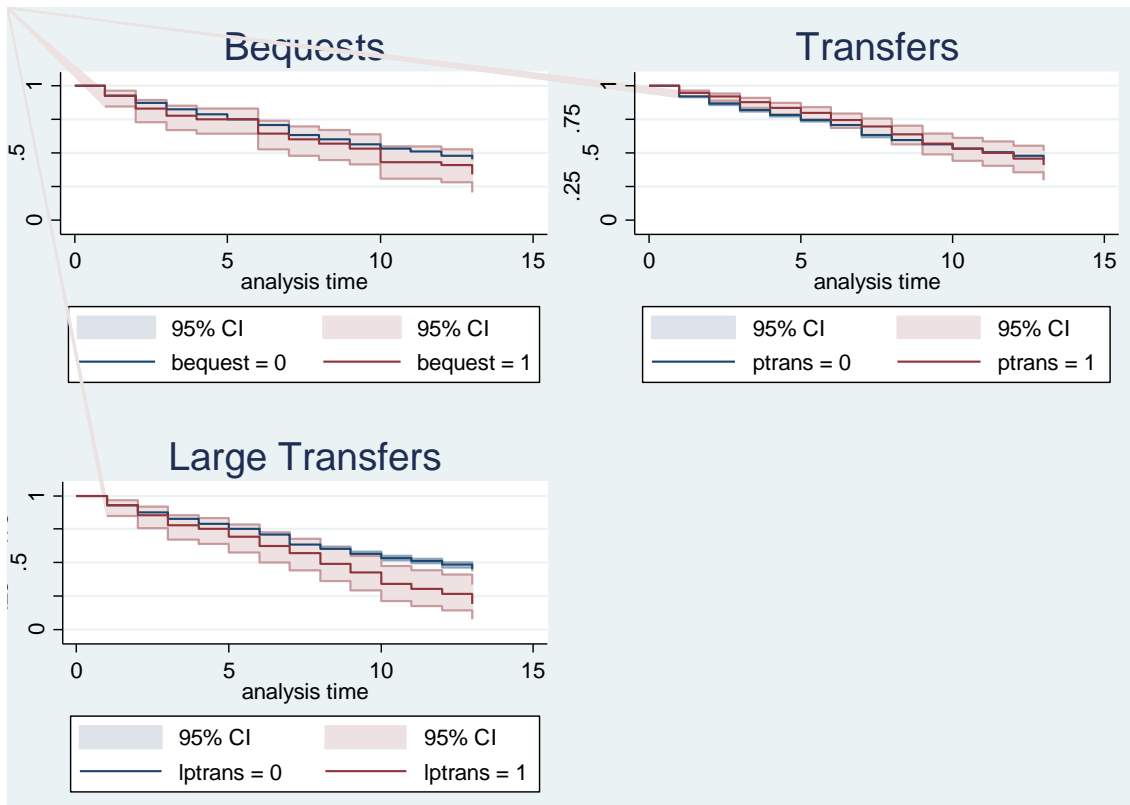
Figure 4: Survivor function, singles
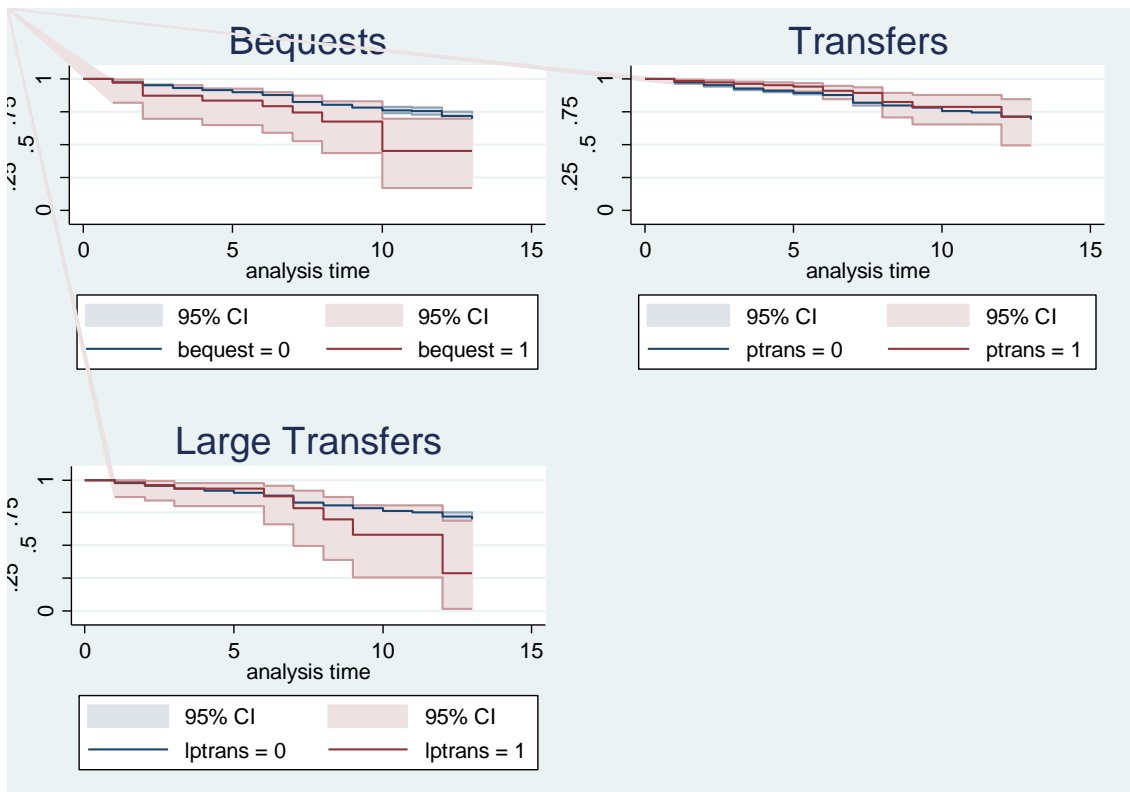
Figure 5: Survivor function, couples
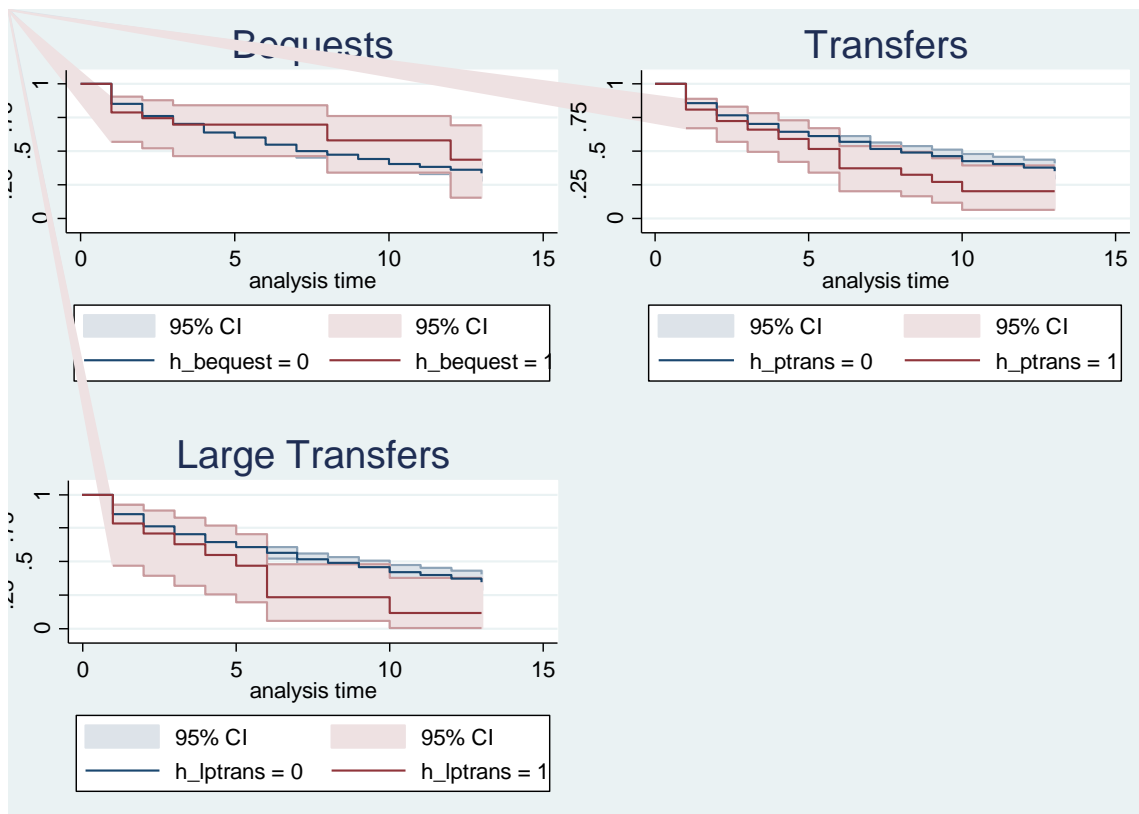
5.3.3 Regression models

The regression models are estimated using a smaller set of individuals than were included in the duration models. As discussed previously, there is more limited information on the value of the loans and price paid for first-time home purchasers given the structure of the questions in the HILDA data. The implication of this is that the results should be interpreted cautiously and are most appropriately considered to capture the conditional mean of interest. That is, conditional on a range of observable characteristics, how does the value of the loan or purchase price of housing differ among first-time home owners who do and do not receive a bequest or parental transfer.

The regression results are presented in Tables 15 and 16. In general, the coefficients are consistent with a *priori* expectations. For example, both the value of the loan and the purchase price are increasing in education. For the house price regression (Table 16), the coefficient on NSW highlights the significantly higher house prices in New South Wales compared to other states. Similarly, both the value of the loan and house price are increasing in disposable income.

Table 15: Regression model, value of loan

	(1)	(2)	(3)	(4)
Female	0.141	0.565	0.0820	0.533
	(0.902)	(1.045)	(0.902)	(1.053)
Married	4.727***	3.695***	4.700***	3.821***
	(1.008)	(1.142)	(1.008)	(1.149)
Age 25–34 years	1.950*	2.147*	1.993*	1.987
	(1.031)	(1.222)	(1.032)	(1.228)
Age 35–44 years	-2.179	-2.510*	-2.119	-2.565*
	(1.338)	(1.524)	(1.340)	(1.534)
Age 45–54 years	-4.391**	-4.661*	-4.269**	-4.916**
	(2.163)	(2.456)	(2.168)	(2.469)
Age 55–64 years	-15.90***	-16.73***	-15.83***	-16.96***
	(2.667)	(2.799)	(2.669)	(2.815)
NSW	1.612	1.378	1.657	1.230
	(1.740)	(1.932)	(1.741)	(1.943)
Victoria	0.192	-0.317	0.177	-0.479
	(1.799)	(2.011)	(1.798)	(2.022)
Queensland	0.691	1.418	0.799	1.391
	(1.802)	(2.000)	(1.804)	(2.012)
South Australia	-2.228	-2.867	-2.233	-2.849
	(2.094)	(2.390)	(2.094)	(2.404)
West Australia	0.394	-0.296	0.531	-0.284
	(2.147)	(2.428)	(2.150)	(2.443)
Completed HS	3.506***	4.367***	3.463***	4.259***
	(1.290)	(1.525)	(1.290)	(1.533)
Post HS qual.	3.183**	3.042**	3.090**	3.086**
	(1.302)	(1.523)	(1.305)	(1.533)
Undergraduate	8.140***	8.603***	8.020***	8.500***
	(1.243)	(1.432)	(1.247)	(1.440)
Postgraduate	10.73***	11.14***	10.56***	11.12***
	(1.674)	(1.873)	(1.678)	(1.895)
Dis. Inc. ($000s)	0.420***	0.207	0.401**	0.197
	(0.160)	(0.169)	(0.159)	(0.170)
Recd bequest	-2.098	-	-	-
	(2.217)			
Amount bequest	-	-0.380***	-	-
		(0.129)		
Recd parental transfer	-	-	1.572	-
			(1.330)	
Amt parental transfer	-	-	-	-0.0392
				(0.323)
Constant	9.357***	10.34***	9.202***	10.48***
	(2.337)	(2.656)	(2.342)	(2.674)
No. observations	962	758	962	758
R^2	0.224	0.237	0.225	0.228

Source: Authors' own calculations based on waves 3–10 of HILDA. Regressions also include a set of year dummy variables that are not reported.

Table 16: Regression model, house price

	(1)	(2)	(3)	(4)
Female	0.520	1.391	0.515	1.257
	(1.266)	(1.485)	(1.266)	(1.498)
Married	3.260**	2.815*	3.103**	2.461
	(1.414)	(1.622)	(1.416)	(1.634)
Age 25–34 years	3.750***	3.778**	3.981***	3.946**
	(1.446)	(1.735)	(1.449)	(1.748)
Age 35–44 years	2.623	2.352	3.025	2.662
	(1.878)	(2.165)	(1.882)	(2.182)
Age 45–54 years	4.198	4.008	4.814	4.591
	(3.036)	(3.488)	(3.044)	(3.513)
Age 55–64 years	-6.841*	-7.603*	-6.113	-7.083*
	(3.743)	(3.976)	(3.747)	(4.005)
NSW	8.081***	7.521***	8.298***	7.708***
	(2.442)	(2.744)	(2.444)	(2.764)
Victoria	1.788	1.202	2.007	1.625
	(2.524)	(2.856)	(2.524)	(2.877)
Queensland	3.162	3.617	3.330	3.778
	(2.529)	(2.841)	(2.533)	(2.863)
South Australia	1.308	1.156	1.353	1.146
	(2.939)	(3.395)	(2.939)	(3.420)
West Australia	4.065	3.483	4.346	3.486
	(3.013)	(3.449)	(3.019)	(3.475)
Completed HS	3.683**	4.117*	3.681**	4.266*
	(1.811)	(2.166)	(1.811)	(2.181)
Post HS qual.	3.007	3.171	2.747	3.000
	(1.827)	(2.164)	(1.832)	(2.180)
Undergraduate	11.86***	12.34***	11.63***	12.56***
	(1.744)	(2.034)	(1.750)	(2.049)
Postgraduate	12.51***	12.28***	12.31***	11.65***
	(2.349)	(2.660)	(2.355)	(2.696)
Dis. Inc. ($000s)	0.492**	0.348	0.543**	0.330
	(0.225)	(0.240)	(0.223)	(0.242)
Recd bequest	5.714*	-	-	-
	(3.111)			
Amount bequest	-	0.763***	-	-
		(0.183)		
Recd parental transfer	-	-	3.189*	-
			(1.867)	
-	-	-	-	1.149**
				(0.460)
Constant	11.04***	10.96***	10.47***	11.08***
	(3.279)	(3.772)	(3.288)	(3.804)
No. observations	962	758	962	758
R^2	0.177	0.189	0.176	0.177

Source: Authors' own calculations based on waves 3–10 of HILDA. Regressions also include a set of year dummy variables that are not reported.

Again, the focus is on measures of intergenerational transfers, namely bequests and parental transfers. In general, the estimated coefficients on this set of variables are insignificant in the loan value regression (Table 15). This would suggest that conditional on other observed variables that have been included in the regression, the value of the loan taken out by first-time home buyers who receive a bequest or parental transfer is not significantly different from the value of the loan taken out by those who do not receive a transfer of this nature. In comparison, the results reported in Table 16 for the house price equation are all generally positive and significant. That is, conditional on observables that have been included in the regression, the house price paid by first-time home buyers who receive a bequest or parental transfer is significantly greater than the price paid by those who do not receive a transfer of this nature.

The results of the regression analysis suggest that for those who do receive an intergenerational transfer, the transfer is associated with an increase in the purchase price rather than a decrease in the value of loan taken out. That is, the transfer may be used to supplement the recipients own savings and be used to purchase a greater quantity or higher quality of housing rather than limiting the size of the mortgage. Such results are largely consistent with the findings of Engelhardt and Mayer (1998) for the United States.

The analysis in this chapter highlights the important relationship between intergenerational transfers and first-time home ownership. In doing so, the analysis confirms the results identified in the Positioning Paper using a more robust manner that exploits additional information available in the HILDA data. Moreover, the regression analysis suggests an additional dimension through which intergenerational transfers facilitate housing consumption, namely an increase in the price paid by first home buyers.

6 INTERGENERATIONAL TRANSFERS AND INEQUALITY

The analysis in this chapter considers the impact of intergenerational transfers on the distribution of wealth in Australia over time. As noted in Chapter 3, the empirical evidence on this issue from other countries is somewhat mixed. Although bequests in particular have tended to increase in countries such as the United Kingdom, it has not led to an increase in measured inequality despite the fact that wealthier individuals tend to receive larger transfers. The reason for this relates to the pattern whereby less wealthy individuals tend to receive, in a proportional sense, higher transfers.

The issue of intergenerational transfers and inequality is particularly important in the housing context. Housing usually represents the largest single asset that individuals or households acquire over the life-cycle. With the recent rapid increase in housing prices, there is a potential for intergenerational transfers backed by these assets having significant implications on the distribution of wealth in Australia. Moreover, such transfers may provide opportunities to the recipients that are not open to those who do not receive significant transfers in the housing context and wealth generation more generally.

6.1 Data, methodological issues and sample specification

The analysis in this chapter focuses on the household wealth information which is recorded in special modules of the HILDA Survey. Detailed wealth information is collected in 2002 (wave 2), 2006 (wave 6) and 2010 (wave 10). The survey data consists of a number of linked household and persons files. Individuals within the same household are linked within a wave, and individuals are tracked across waves.

The sample for the analysis of wealth was constructed through a sequence of steps. First, a household `reference' person was defined for each household in wave 2. The reference person was selected by applying the following criteria in order:

1. one partner of a couple
2. lone parent
3. single person
4. the person with the lowest `person number' on the household questionnaire.[18]

The household reference person from wave 2 was tracked across subsequent waves to create a longitudinal record for the household. Second, households composed of multiple families were dropped from the sample due to concerns for potential measurement error. Multiple family households are predominately group households composed of numerous single adults and the information on household wealth is less reliable, especially when unrelated individuals report for other household members. Therefore, the analysis is conditional on single family households.

The focus of the analysis is the distribution of household wealth or 'net worth', and the major components of home net equity, total property assets and financial wealth. Net worth is constructed from a detailed inventory of wealth components. Home assets are defined as the value of equity minus debt for the principal residence. Total property assets are home assets plus other property (investment) holdings. Financial assets consist of the value of bank accounts, superannuation balances, cash and equity investments, trust funds and life insurance. Other components of net worth include non-financial assets such as business assets, vehicles and collectibles. See Summerfield et al. (2015, pp.70–77) for detailed information.

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[18] In the large majority of cases this method also selected the person who supplied most of the information recorded on the Household Questionnaire.

To examine intergenerational influences on the observed distribution of wealth, the role of bequests and parental transfers are considered in the analysis. Household receipt of bequests and parental transfers is constructed from the longitudinal information in the HILDA Survey. Using the annual responses to the survey—the household receipt of bequests and parental transfers is constructed by determining whether any such transfers were reported by the household reference person, or the partner of the reference person (where appropriate) in the four years prior to the 2006 and 2010 surveys, and in the two years prior to the 2002 survey, respectively. The total amount of bequests and parental transfers received were calculated analogously using either a four-year window (2006 and 2010) or a two-year window (2002).

In analysing the distribution of wealth, and the role of bequests and parental transfers—all nominal values are converted to real 2014 values using the Australian Bureau of Statistics CPI series (for all items, Australia-wide).

To better understand the distribution of wealth, and changes through time, the analysis considers the role of housing tenure. The key distinction is between home owners and renters. Within the group of home owners, a distinction is made between those who own the home outright ('outright owners') and those who still have a mortgage ('mortgagees'). A range of demographic factors (age of reference person, family type, dependent children) and socio-economic characteristics (reference person educational attainment, household disposable income, and state of residence) are considered in the analysis.

Table 17 below presents descriptive statistics for the sample by wave of the HILDA Survey. In 2002, the average net worth of Australian households was $664 309 in 2014 values. Average wealth grew in real terms by 28 per cent to 2006, and increased by a further 9 per cent from 2006 to 2010. The slowdown in wealth growth is unsurprising given the GFC which began in late 2007 and the associated volatility in financial and equity markers. Home net equity accounted for approximately 38 per cent of households' net worth on average in 2002 and 2006, and 41 per cent in 2010.

Further details on the relationship between tenure and wealth are presented in Table 17 below. This table presents a series of cross tabulations between household wealth (and components of wealth) by housing tenure in 2002, 2006 and 2010. Several features stand out. First, home owners on average have substantially higher average net worth than renters. Home owners, by definition, on average have substantial wealth held in the form of equity in the principal residence, and in other property investment. The most important component of household wealth for renters is financial wealth. Second, renters are less likely to receive a bequest and, conditional on receipt, the amount received is lower for renters. Renters are more likely than home owners to receive a parental transfer though the amount, conditional on receipt, is substantially less for renters as well.

Table 17: Summary statistics, wealth analysis

	2002	2006	2010
Net worth (2014$)	664,309	848,744	926,827
Net worth if >0	687,852	877,507	952,648
Home assets	251,497	335,165	373,848
Total property assets	308,199	461,049	495,608
Financial wealth	250,392	327,896	498,372
Received bequest	0.030	0.099	0.095
Bequest amount	2544	11,289	8,232
Rec.d parental transfer	0.086	0.142	0.101
Parental transfer amt	568	1,387	1,289
Tenure			
Owner (w/out mort.)	0.352	0.354	0.365
Owner (with mort.)	0.394	0.386	0.387
Renter	0.228	0.233	0.0.217
Personal characteristics			
Age (years)	44	48	52
Married/partnered	0.764	0.724	0.710
Household structure			
Coup., no dep child.	0.372	0.379	0.398
Coup. with dep. child.	0.392	0.345	0.312
Lone parent with dep	0.057	0.048	0.042
Lone person	0.143	0.175	0.190
Other household type	0.035	0.035	0.037
Number of children	0.699	0.612	0.523
Socio-economic characteristics			
H/hold disp. income	1,418	1,579	1,701
Education			
Postgraduate	0.030	0.038	0.044
Grad. cert./diploma	0.050	0.056	0.062
Bachelor	0.119	0.130	0.133
Diploma	0.088	0.093	0.097
Certificate	0.192	0.218	0.228
Year 12	0.138	0.131	0.111
Year 11	0.377	0.327	0.318
Location			
New South Wales	0.310	0.301	0.300
Victoria	0.251	0.248	0.248
Queensland	0.195	0.203	0.205
South Australia	0.094	0.094	0.092
Western Australia	0.097	0.097	0.097
Tasmania	0.029	0.030	0.029
Northern Territory	0.006	0.007	0.008
Australian Capital Territory	0.017	0.019	0.019
Observations	5149	5623	5940

Source: Authors' own calculations using waves 2, 6 and 10 HILDA.

Table 18: Wealth, bequests and parental transfers by housing tenure

	Owner (with or w/out mort.)	Owner without mortgage	Owner with mortgage	Renter
2002				
Net worth (2014$)	831,543	1,048,318	638,285	145,504
Home assets	336,588	414,953	277,701	0
Total property assets	404,142	490,272	327,356	20,427
Financial wealth	303,185	389,070	226,618	82,009
Received bequest	0.033	0.037	0.030	0.019
Bequest amount	3,277	4,366	2,304	241
Received parental transfer	0.079	0.059	0.097	0.110
Parental transfer amount	505	330	662	766
2006				
Net worth (2014$)	1,068,795	1,327,054	831,619	183,623
Home assets	451,722	562,058	350,392	0
Total property assets	600,630	733,360	478,737	52,873
Financial wealth	399,153	508,800	298,457	104,291
Received bequest	0.114	0.128	0.101	0.054
Bequest amount	14,036	21,503	7,178	3,058
Received parental transfer	0.117	0.083	0.149	0.223
Parental transfer amount	1,443	1,318	1,557	1,301
2010				
Net worth(2014$)	1,151,480	1,406,348	910,872	197,862
Home assets	496,613	617,188	382,785	0
Total property assets	636,482	769,230	511,160	56,307
Financial wealth	374,396	458,178	295,300	120,669
Received bequest	0.103	0.105	0.102	0.069
Bequest amount	10,212	11,786	8,726	2,218
Received parental transfer	0.086	0.045	0.124	0.153
Parental transfer amount	1441	910	1943	590

Source: Authors' own calculations using waves 2, 6 and 10 HILDA.

6.2   Empirical estimates

6.2.1 Distribution of wealth, by tenure

The next step in the analysis is to consider the complete distribution of household wealth. Figure 6 below present the kernel density plot for the distribution of household net worth in 2002 by the household's housing tenure. It is clear from the plot that renters have substantially less wealth than home owners. The wealth distribution among renters has a large mass bunched at zero, which is the dominant peak in Figure 6. The wealth density function for home owners with a mortgage is more dispersed and to the right, and the density for home owners without a mortgage is further to the right—reflecting the higher average level of wealth for this group.

The pattern of the wealth distributions by housing tenure observed in 2002 is mirrored in the 2006 and 2010 distribution, as illustrated in Figures 7 and 8 below, respectively. This pattern in the distribution of wealth by tenure type reflects an array of life-cycle, family background and socio-economic factors. We know, for example, that younger individuals in the early stages of their life-cycle and housing careers have accumulated little or no net wealth and are more likely to reside in rental tenure. As individuals age and couple households form, wealth is accumulated, including through savings in the form of housing.
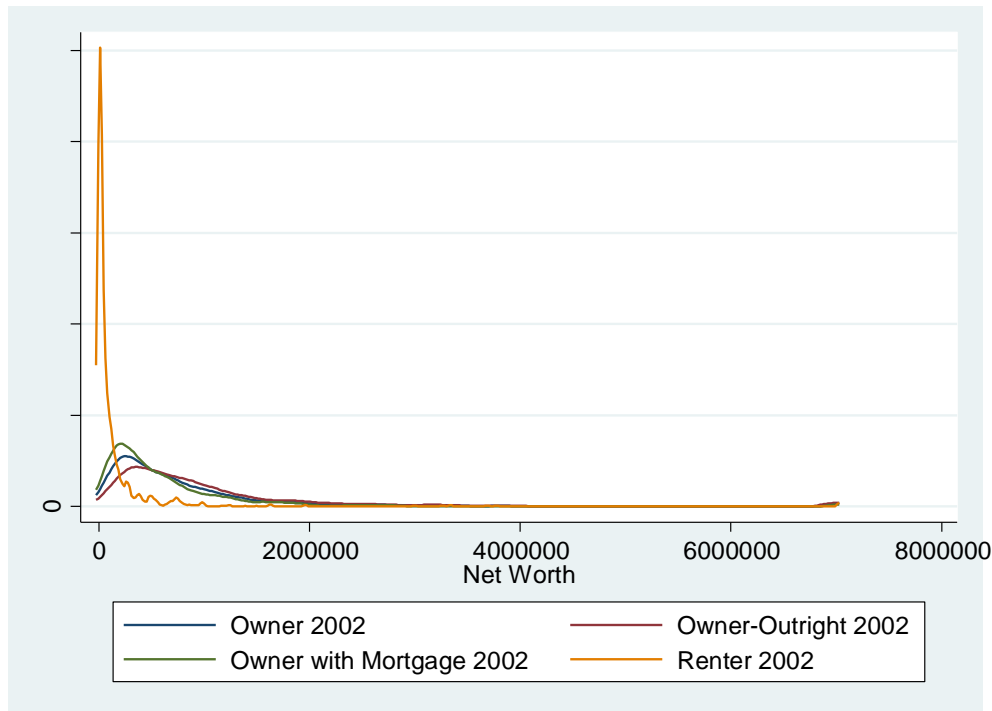
Figure 6: Household wealth distribution in 2002 by tenure

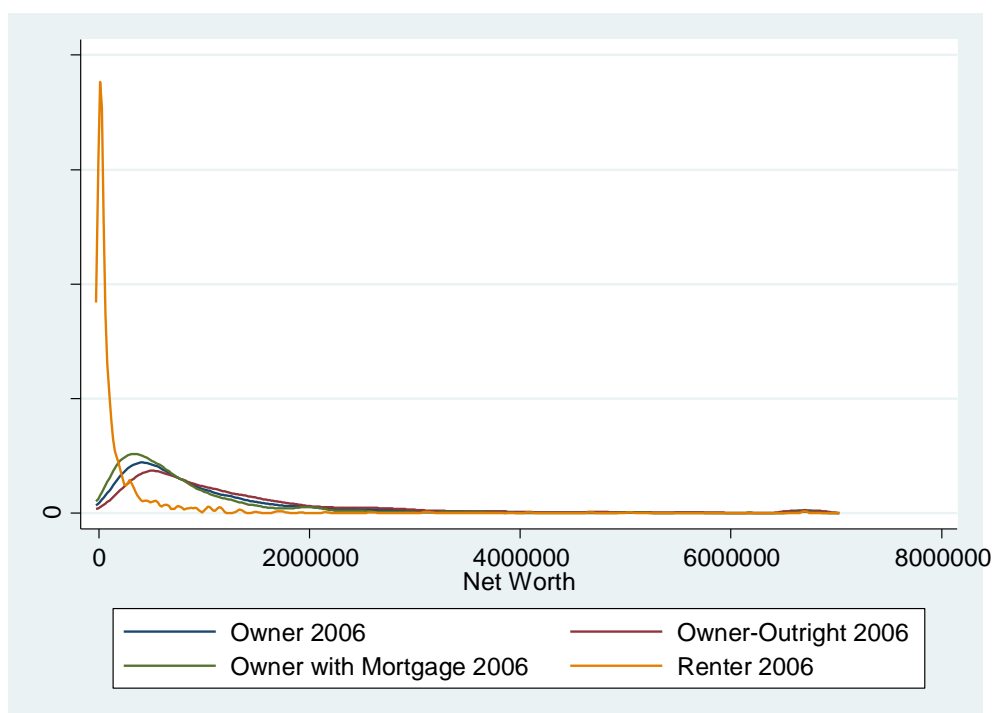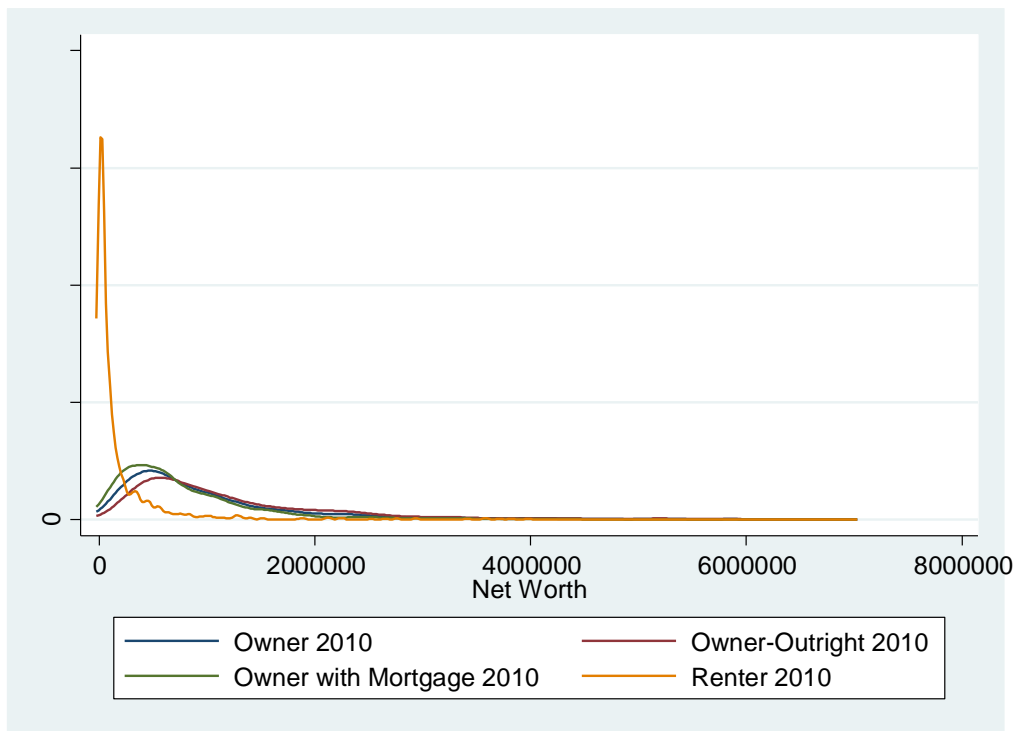**Figure 7: Household wealth distribution in 2006 by tenure**

Figure 8: Household wealth distribution in 2010 by tenure

Figure 8: Household wealth distribution in 2010 by tenure — kernel density plot of Net Worth with series: Owner 2010, Owner-Outright 2010, Owner with Mortgage 2010, Renter 2010.

6.2.2   Changes over time in the distribution of wealth by tenure type

The summary statistics indicated significant growth in average wealth across Australian households from 2002 to 2006, and to a lesser extent, 2006 to 2010. To more clearly discern how the growth in household wealth varies by housing tenure, the following series of figures presents the kernel density plots over time for each tenure category.

Figure 9 below presents the household net worth density for home owners (with or without mortgages) across consecutive wealth surveys from HILDA. The rightward shift in the densities over time clearly reflects the strong growth in real wealth between 2002 and 2010. Accompanying the growth has been an increase in dispersion, characterised by lower peaks at modal wealth. Decomposing this evolution in the wealth distribution for outright-owners and mortgages—shown in Figures 10 and 11 respectively, reveals that both groups experienced substantial real wealth growth, though it was stronger (especially in the mid-upper range of wealth levels) for the outright home owner group. Figure 12 below presents the household worth density plots for the subpopulation of renters. The striking features of the graph are the substantially higher concentration at low level of net worth, and the relatively static nature of the densities over time.

The pattern of changes in the wealth distributions in part reflects the importance of home ownership as a form of capital investment and the substantial capital gains to housing experienced over the 2002–10 period. The stable distribution of wealth over time for the group of renters, and the concentration at relatively low levels of wealth, indicates that this section of the population has not experienced the gains in wealth that has accrued to home owners over time, and suggests a growing level of inequality between the sections of the populations.

Figure 9: Household wealth distribution 2002–10, home owners

Legend:
- Owner 2002
- Owner 2006
- Owner 2010

Axes: Net Worth (0 to 8000000)
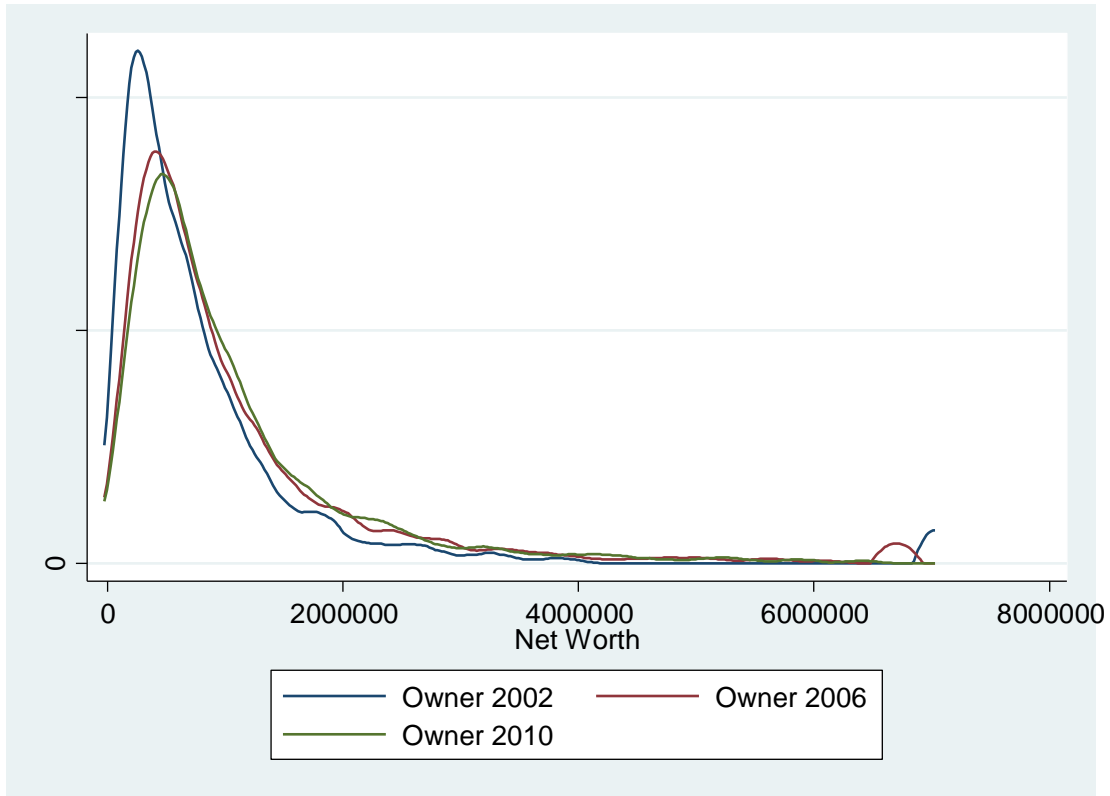
Figure 10: Household wealth distribution 2002–10, home owners (outright)

Legend:
- Owner-Outright 2002
- Owner-Outright 2006
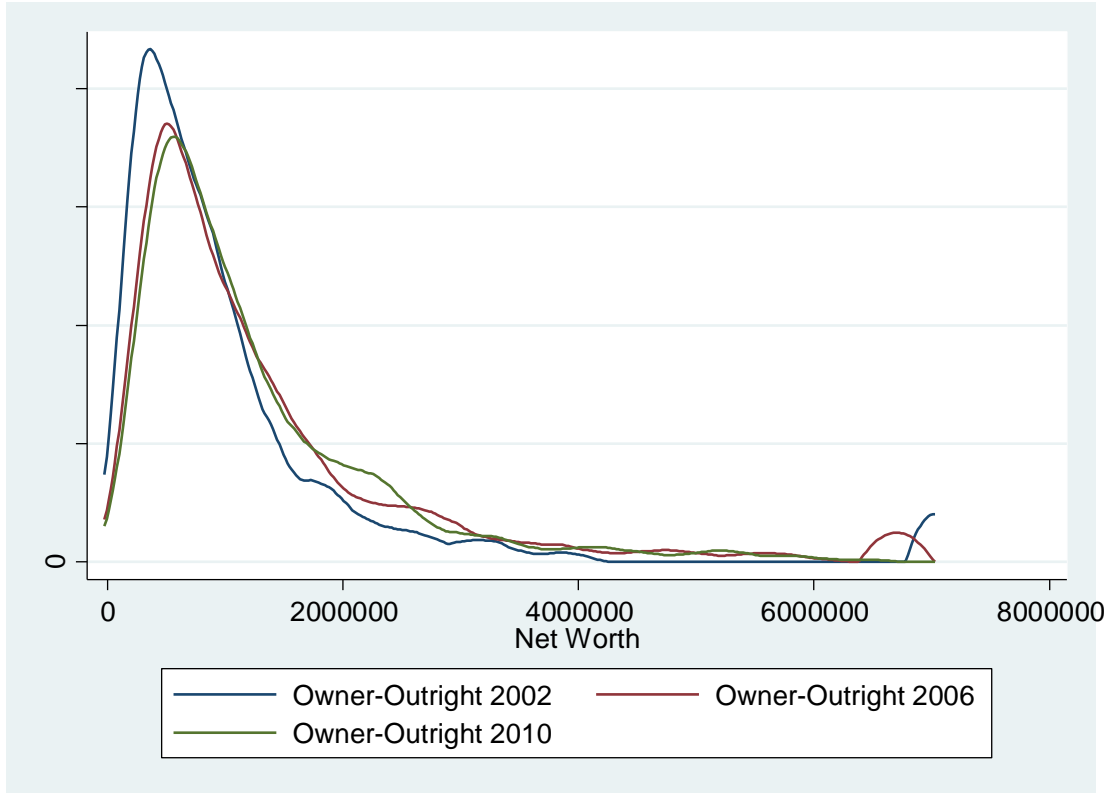- Owner-Outright 2010

Axes: Net Worth (0 to 8000000)

Figure 11: Household wealth distribution 2002–10, home owners (with mortgage)
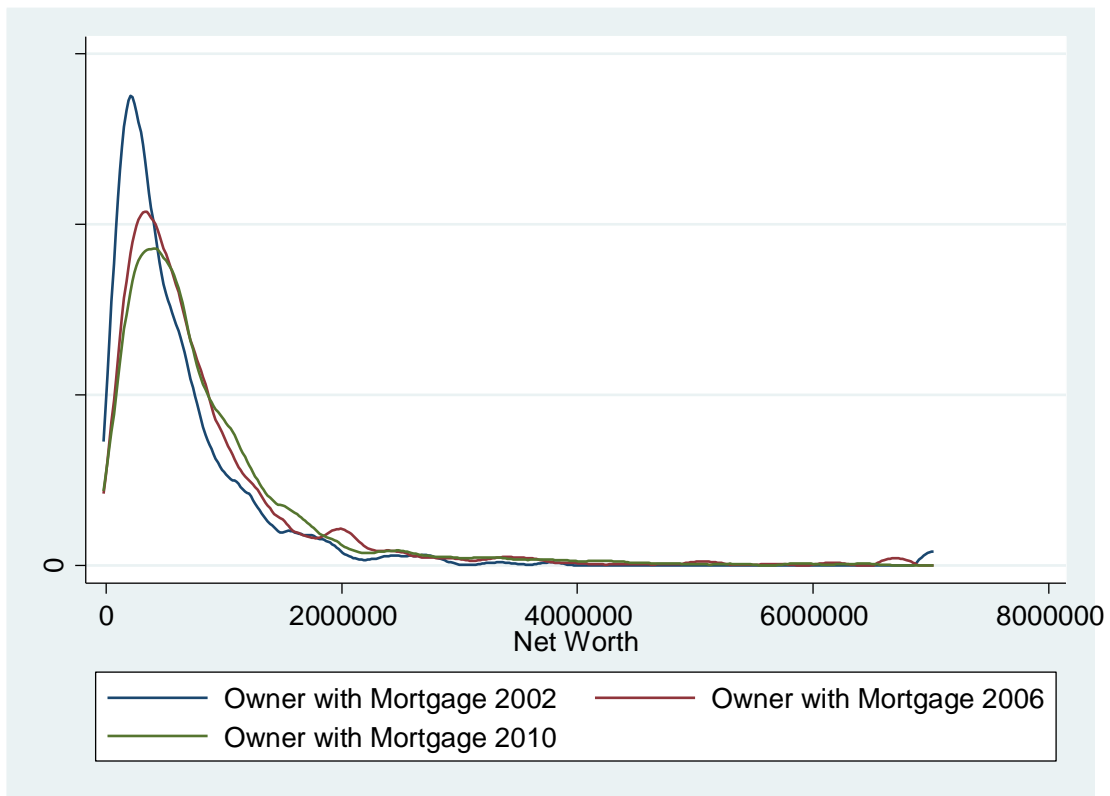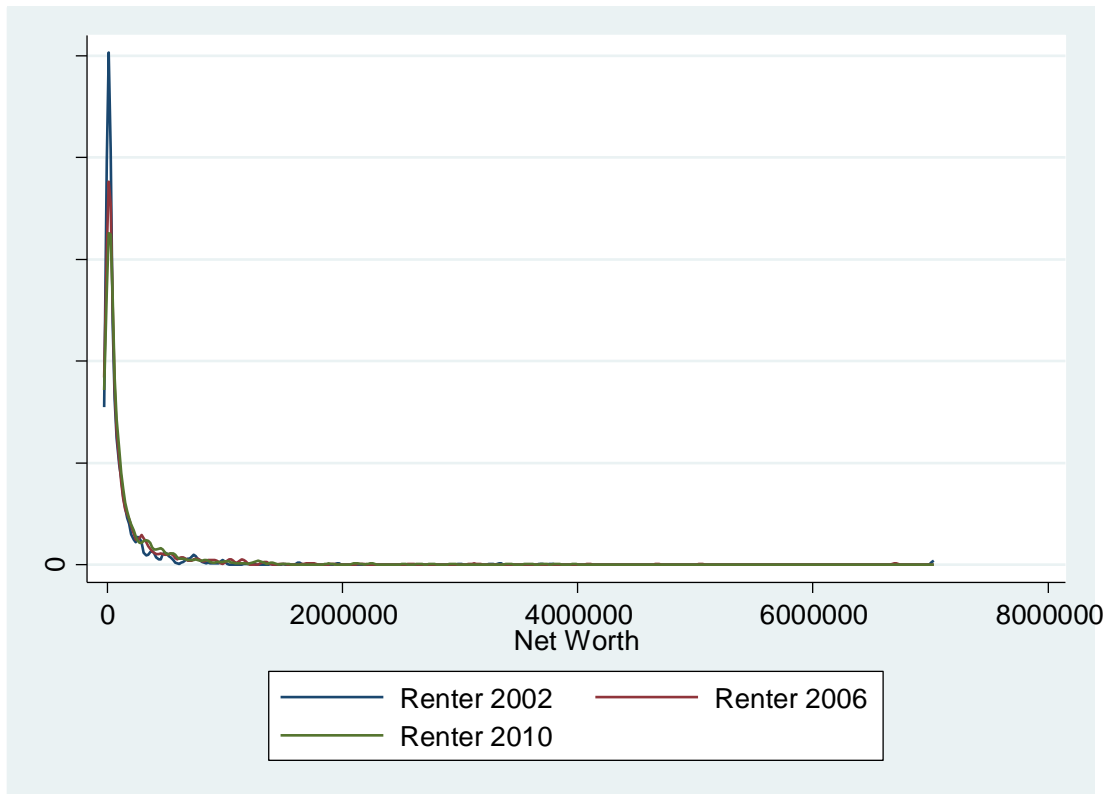

Figure 12: Household wealth distribution 2002–10, renters

6.2.3 Counterfactual wealth distributions

A key question for this report relates to how the distribution of wealth has been affected by intergenerational transfers. To address this question, a series of hypothetical wealth distributions are constructed in order to assess the impact of bequests and parental transfers on the distribution of wealth, and on distributional differences by tenure. In order to construct the counterfactual distributions, the multivariate method proposed by DiNardo, Fortin and Lemieux (1996) (DFL) are employed.

The DFL method is based on the expression of the multivariate density function as the product of a conditional density and marginal distribution. Specifically, the wealth distribution at a point in time t, can be expressed as the product of the relation between wealth W and attributes x, and the distribution of attributes at time t. In particular:

$$f^t(W) = \int_\Omega f^t(W|x)\, h(x|t)\, dx$$

Where $f^t(W)$ is the wealth determination process at time t that relates individual and family characteristics to wealth levels W in the population denoted by Ω. The density function $h(x|t)$ represents the distribution of attributes in year t. This formulation of the wealth distribution is particularly useful for making comparisons of distributions. For example, the difference in the distribution of wealth in 2010 and 2002 is given by the following:

$$f^{2010}(W) - f^{2002}(W) = \int_\Omega f^{2010}(W|x)\, h(x|t=2010)\, dx - \int_\Omega f^{2002}(W|x)\, h(x|t=2002)\, dx$$

It is interesting to consider the distribution that may have prevailed if specific circumstances or attributes do not change, or change in a pre-specified way. For instance, the counterfactual wealth distribution in 2010 that may have prevailed if the distribution of attributions were given by a hypothetical distribution, such as all bequests set equal to zero, is given by:

$$\tilde{f}^{2010}(W) = \int_\Omega f^{2010}(W|x)\, \tilde{h}(x|t=2002)\, dx$$

Where $\tilde{h}(x|t=2002) = \tilde{h}(x|t=2010)$ with all b_i set identically to 0. By considering different counterfactual distributions such as this, it is possible to better understand how the distribution of bequests has changed through time, and how this is related to changes in the distributions of wealth or housing equity.

The application of the DFL method is based on reweighting the observed wealth distribution conditional on the group of interest. For instance, to construct $\tilde{f}^{2010}(W)$ the following approach is used:

$$\tilde{f}^{2010}(W) = \int_\Omega f^{2010}(W|x)\, h(x|t=2002)\, dx = \int_\Omega f^{2010}(W|x)\, h(x|t=2002) \cdot \Psi_{x|2002}\, dx$$

Where

$$\Psi_{x|2002} = \frac{h(x|t=2002)}{h(x|t=2010)}$$

The $\Psi_{x|2002}$ is a reweighting function and the counterfactual is constructed by reweighting the observed 2010 wealth distribution by the ratio of the conditional distribution of attributes in the two years. In effect, the 2010 distribution of attributes is reweighted to mimic the 2002

distribution or the scenario of interest. DiNardo, Fortin and Lemieux (1996) show that, by applying Bayes rule, the reweighting function can be expressed as follows:

$$\Psi_{x|2002} = \frac{h(x|t=2002)}{h(x|t=2010)} \bullet \frac{\Pr(t=2010)}{\Pr(t=2002)}$$

which is straightforward to estimate using a probit model after pooling the observed data for the two years involved in the comparison.

The next series of figures compare the observed distributions of net worth and the hypothetical distribution of net worth if bequests and parental transfers were mechanically set to zero. The probit specification for the weighting function included controls for age and educational attainment of the household reference person, indicators for family type, number of dependent children, a quadratic in household disposable income plus indicators for whether bequests or parental transfers were received, and the amounts of those receipts. The weighting functions were estimated separately by tenure status with 2002 as the reference year.

Figure 13 below provides a comparison of the predicted wealth distribution among owners in 2002 for the hypothetical case where all bequests and parental transfers are removed. The overall shape of the predicted density closely mirrors the observed distribution. There is, however, a detectable shift to the left of the distribution, which is greater above the mode and toward the top of the distribution. Similar patterns are evident when outright home owners and mortgagees are treated separately (Figures 14 and 15, respectively). However, for the case of renters, presented in Figure 16 below, the relatively low values of bequests and parental transfers received results in very little difference between the observed and predicted wealth distributions.

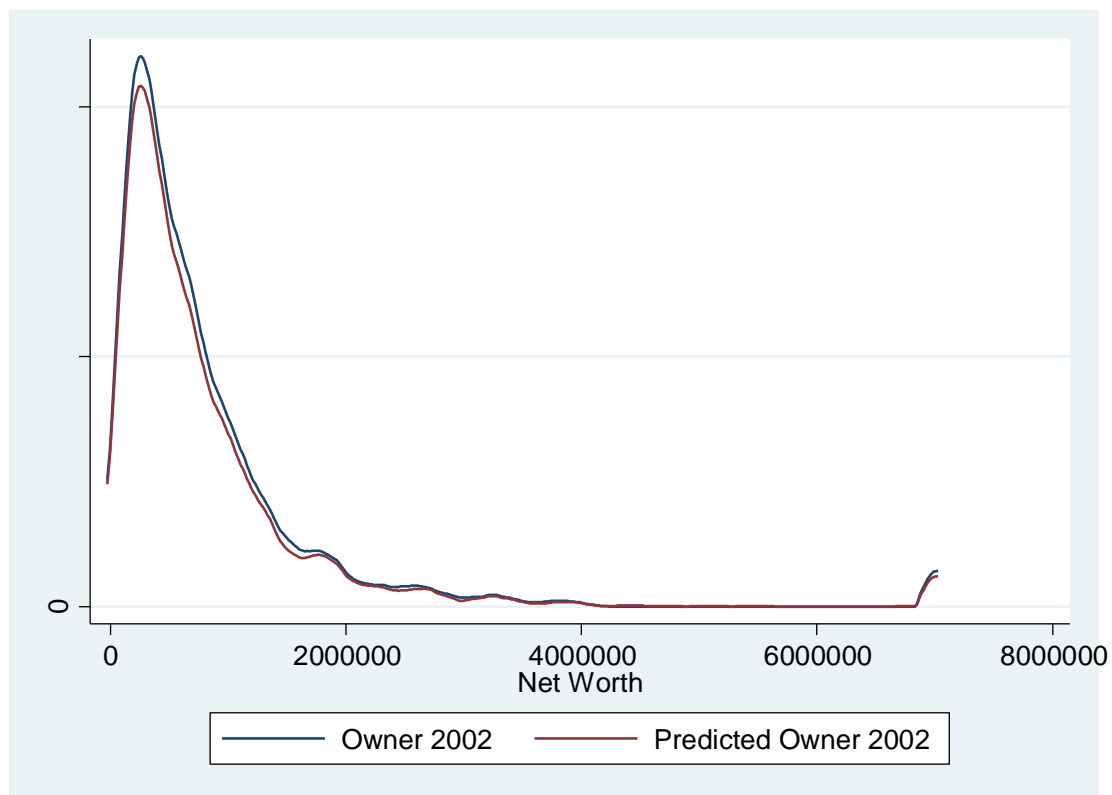**Figure 13: Predicted and actual wealth distribution, 2002 home owners**

Figure 14: Predicted and actual wealth distribution, 2002 home owners (outright)
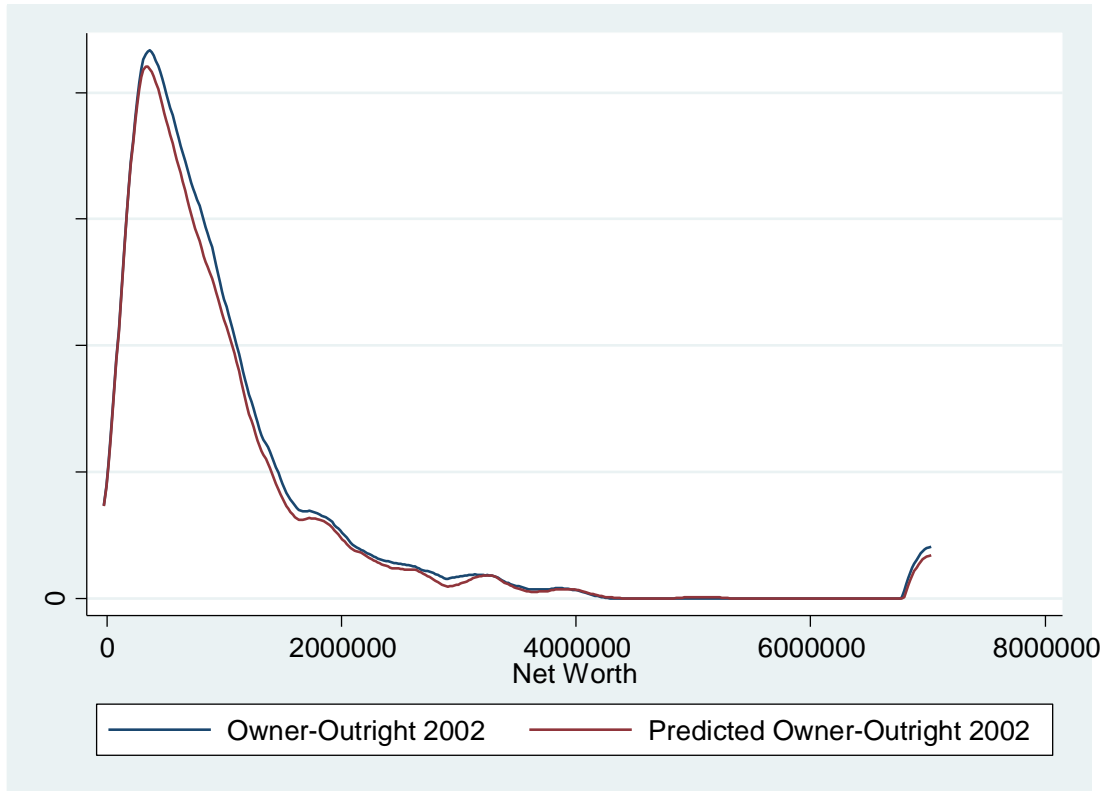
Figure 15: Predicted and actual wealth distribution, 2002 home owners (with mortgage)
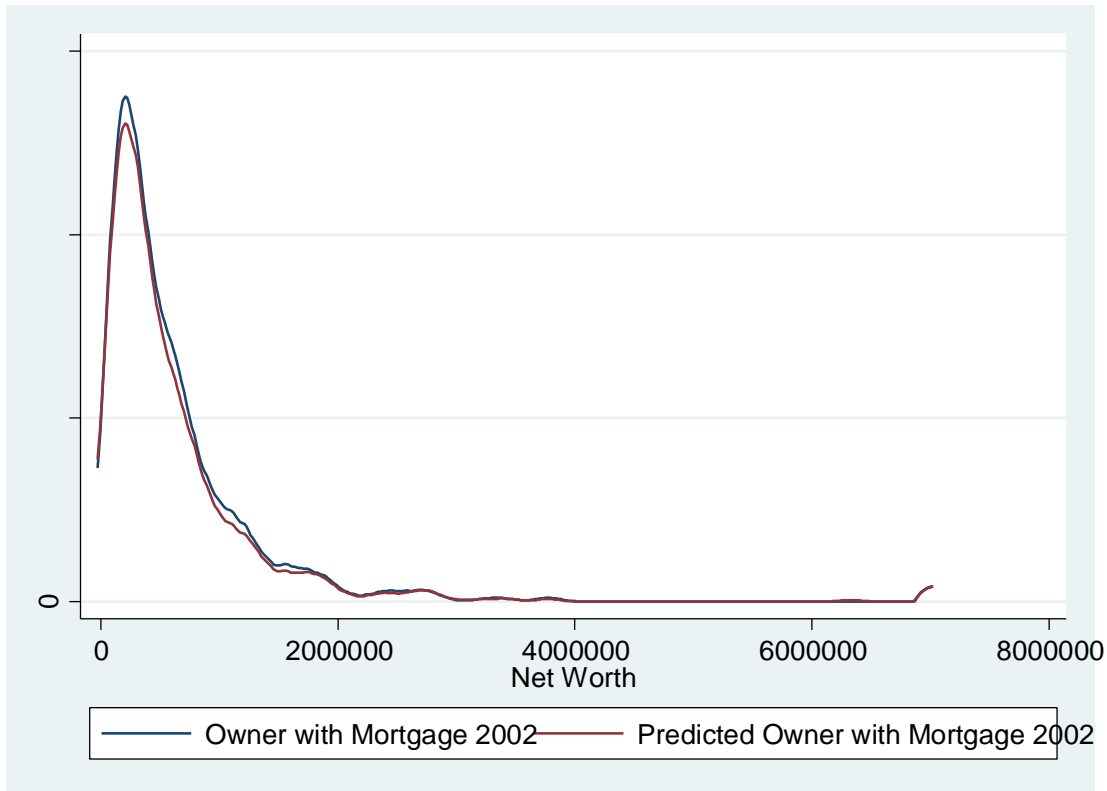
Figure 16: Predicted and actual wealth distribution, 2002 renters
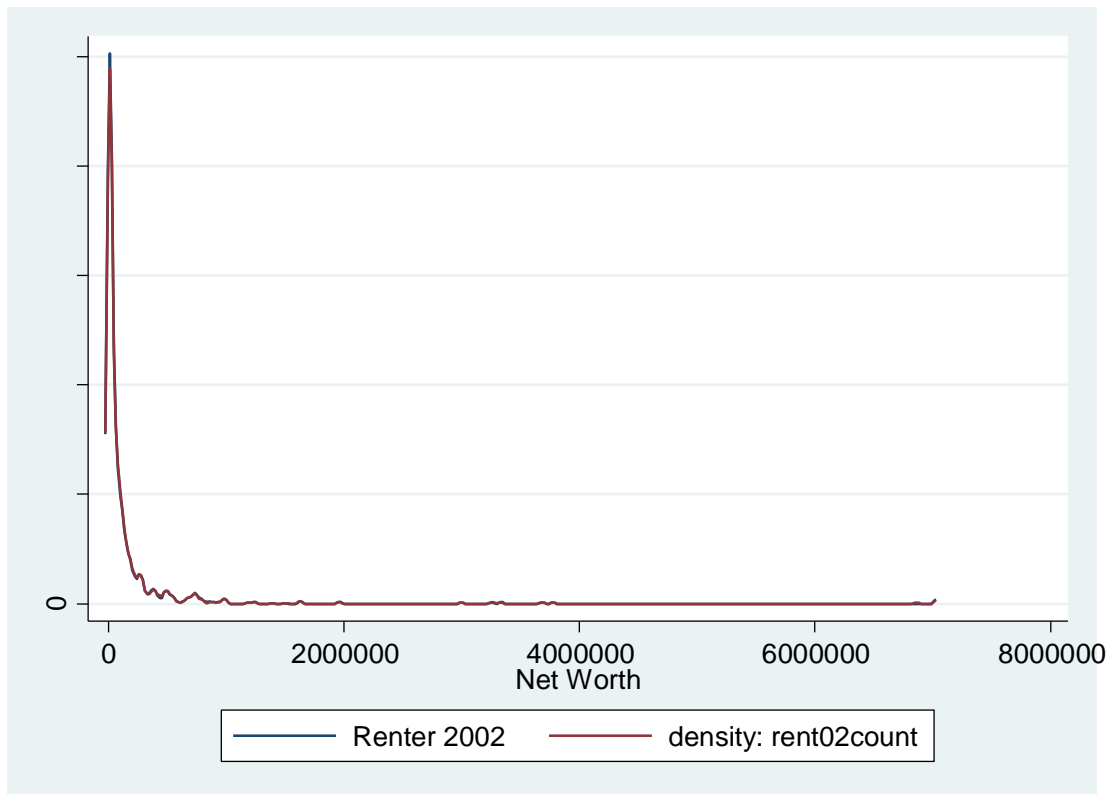
Generation of the counterfactual wealth distributions highlights the important role played by intergenerational transfers on wealth outcomes. In particular, it is apparent that the removal of bequests and parental transfers from recipient households in 2002 lead to a reduction in wealth inequality among home owners. Further, given the generally low wealth levels of renters, and the significantly smaller value of transfers received, this scenario implied a reduction in wealth inequality across tenure status groups. This, in turn, implies that the bequests and parental transfers observed in 2002 tended to increase the level of cross-sectional inequality in the distribution of wealth across Australian households.

The predicted wealth distributions were then compared overtime to assess the impact of bequests and parental transfers on the evolution of wealth inequality over the period 2002–10. Figure 17 below presents the kernel density plots for the predicted and actual wealth distribution for home owners over the observation period. Figure 18 below presents the analogous distributions for renters.

Over time the analysis indicates that the distribution of wealth became more dispersed and unequal; a pattern which is reflected in the wealth distributions for the set of home owners. The hypothetical distributions, with bequests and parental transfer shut down or effectively 'switched off', indicate reduced growth in wealth inequality for the period. However, in contrast, the wealth distribution among renters is much more stable over time. In addition, the comparatively low levels of bequests and parental transfers received by renters means that removing those private transfers had virtually no impact on wealth inequality within this group. The implication from these comparisons is that bequests and parental transfers contributed to an increase in wealth inequality over the 2002–10 period.

Figure 17: Predicted and actual wealth distributions, 2002–10 owners

Predicted Owner 2002	Predicted Owner 2006
Predicted Owner 2010	Owner 2002
Owner 2006	Owner 2010
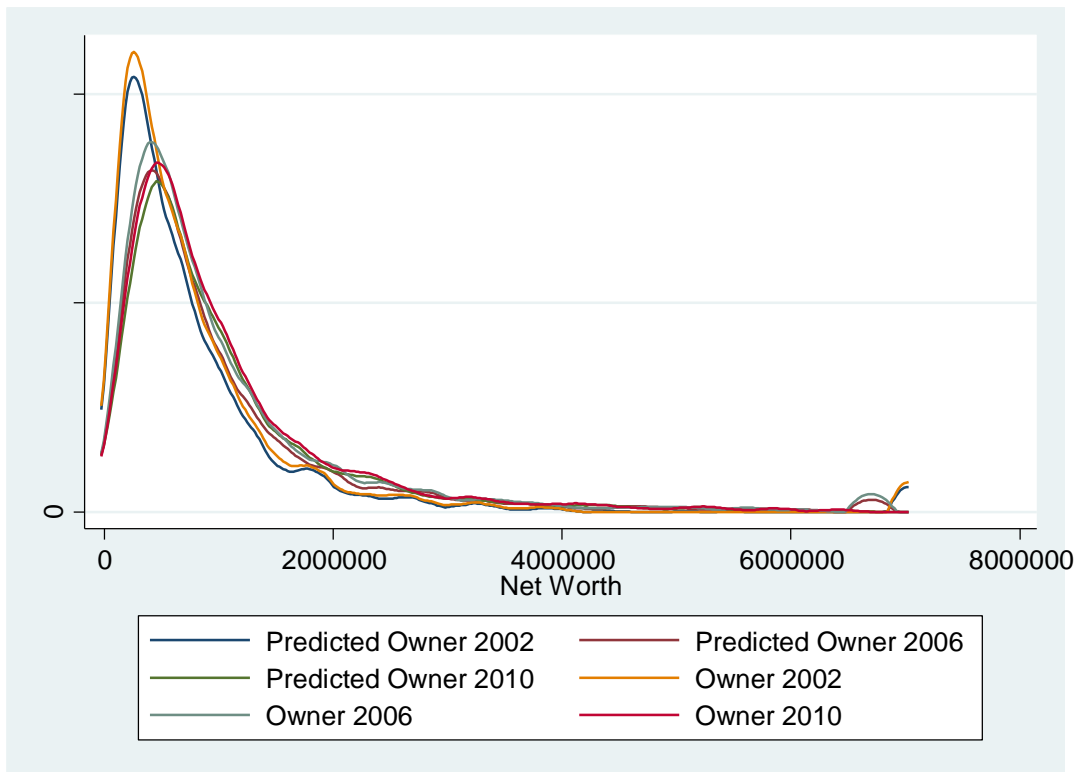
Figure 18: Predicted and actual wealth distributions, 2002–10 renters

density: rent02count	Predicted Renter 2006
Predicted Renter 2010	Renter 2002
Renter 2006	Renter 2010
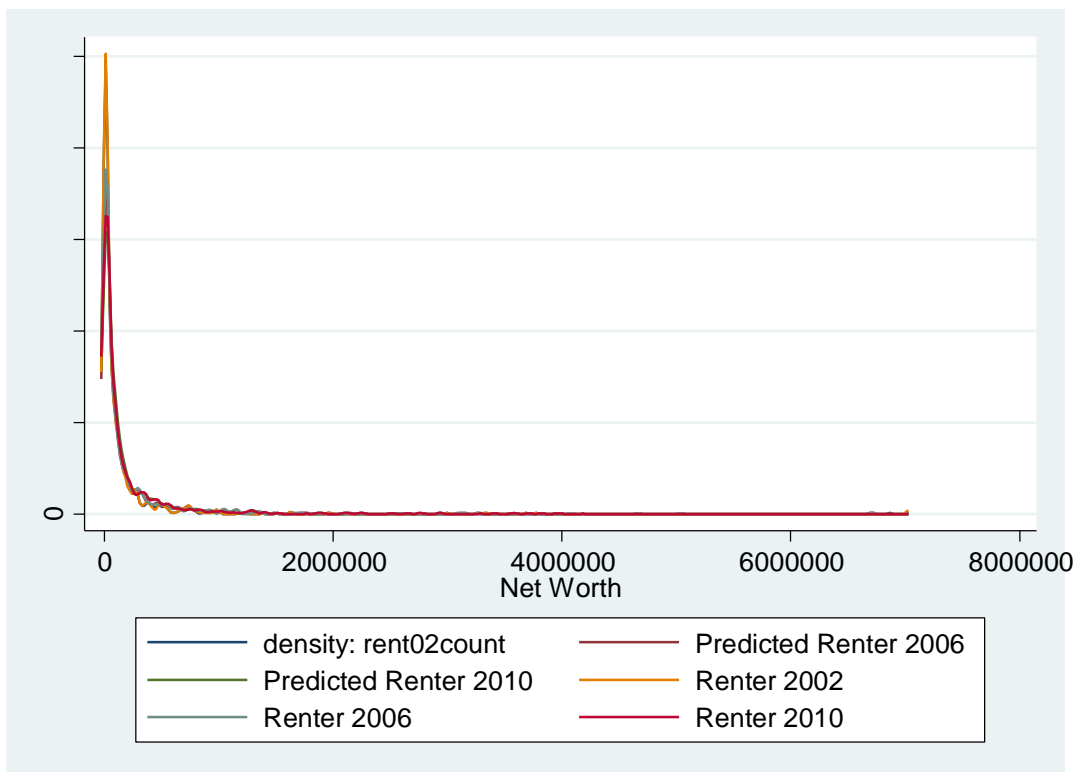
The analysis in this chapter has provided insight into how the distribution of wealth is impacted by intergenerational transfers in the form of bequests and *inter vivos* transfers from parents. The results show two related but nonetheless distinct patterns. First, renters are less likely to receive transfers than individuals in other tenures. Part of the reason for such a pattern is most

likely related to life-cycle considerations, with renters tending to be younger and less likely to receive large bequests. Related to this is the impact of intergenerational transfers over time, namely they have tended to increase the level of measured inequality with home owners gaining relative to those in rental tenure.

7 POLICY IMPLICATIONS

As discussed in Chapter 2, housing ownership is an important part of the Australian social fabric and it is important that policy settings are aligned in a way that ensures that objectives around home ownership are achieved. At the same time, it is clear that policy must be set within an institutional and historical setting that may mean that the 'ideal' policy response is either unfeasible or simply unattainable. The results from the analysis in Chapters 4 to 6 should be read in that context.

Notwithstanding these considerations, there are a number of dimensions along which the findings from the empirical analysis can in fact inform policy-making. These include outcomes relating to home ownership and housing security; labour supply and economic participation; and, retirement incomes policy in the form of savings and wealth accumulation behaviour. In developing appropriate policy settings that take into account the findings in this report, it is also important to understand the interrelated nature of the responses that are likely. Changes in retirement incomes policy that acknowledge the role of bequests and *inter vivos* gifts may induce behavioural responses in terms of labour supply over the long term.

7.1.1 Tax policy—the design of appropriate taxes

The recent review of the Australian Taxation system (the 'Henry Report') identified a range of proposals to improve the efficiency and equity of taxes (Department of Treasury 2010). One obvious policy that might improve the overall operation of the tax system and has clear implications for housing and the analysis conducted in this report is that of wealth transfer taxes. Bequest taxes are a 'relatively efficient means of taxing savings' which are unlikely to induce large behavioural distortions (p.137). Significantly, taxes on bequests have the potential to increase labour supply and savings by potential recipients. Notwithstanding the historical trend away from taxes of this nature in Australia, arguably such imposts should form part of a wider review of the tax system including the current review given the importance of *inter vivos* transfers and bequests identified in this report (Australian Government 2015). Such taxes have the potential to mitigate the adverse effects with respect to inequality of intergenerational transfers. At the same time, it is important to note that such taxes are likely to play a relatively minor role in this context.

7.1.2 Tax and transfer policy—inequality and redistribution

An important role for the tax and transfer system is the redistributive role it plays. As noted in Chapter 2, the Australian tax and transfers system is characterised by a relatively low level of benefits that are highly targeted to those in need through means testing. At present, the family home is excluded from the asset and income means tests that determine eligibility for benefits. What has not been explored in this report is how the value 'locked' up in housing could be released and used in conjunction with the transfer system to ensure sustainable outcomes over time. This could occur, for example, by encouraging the development of a market in reverse mortgages while at the same time including imputed rent from housing in the assets test. This would provide opportunities for asset-rich individuals to draw down and consume the value of wealth stored in housing while at the same time relieving pressure on the transfer system.

7.1.3 Targeted transfer policies

Successive Australian governments have encouraged home ownership through a range of mechanisms including FHOG and stamp duty concessions. It would appear that such policies have paid little or no attention to the role of private transfers in complementing or substituting for these public transfers. The evidence in this report suggests that private transfers have an important role in facilitating entry into home ownership. In light of this, if the policy goal is to increase home ownership, an argument can be set out that transfer policies designed to facilitate home ownership could become more targeted at those who are unlikely to benefit

from such transfers. That is, higher more-targeted subsidies could be directed towards those who are unlikely to receive transfers.

7.1.4 The balance between public and private transfers

In recent years a number of social scientists have argued that in liberal welfare systems, home ownership is the dominant housing tenure because it is an important pillar supporting limited government social programs (Kemeny 2005; Doling & Ronald 2010). There is some empirical support for this idea (Castles 1998), and, in the Australian context, Yates and Bradbury (2010) offer evidence that suggests Australia's home ownership society is a pillar underpinning a retirement income policy that is less generous than in other countries at a similar stage of development. In Australia, these characteristics of retirement incomes policies and the role of housing are particularly important in light of increasing concern about falling rates of home ownership among younger cohorts. The analysis in this report offers fruitful insights into some of these ideas by focusing attention on the appropriate balance between public and private transfers.

Lowe (2011) and Smith and Searle (2008) highlight the possibility that housing assets can be consumed through mechanisms such as reverse mortgages. In a life-cycle context, such policies provide opportunities to home-owning households to insure against income shocks. Moreover, there is an opportunity for existing home owners to support their children's housing aspirations by withdrawing equity in their own housing or by proving an explicit guarantee with their own housing assets. Although not explored in this report, co-residence may also provide a means to provide an indirect transfer to children who suffer life-events such as relationship breakdown which adversely impact on housing careers. The findings in this report highlight the potential for intergenerational transfers, supported housing equity withdrawal to play an important role in supporting the next generation's housing aspirations while at the same time relaxing the fiscal constraints faced by future Australian governments.

Willetts (2010) develops similar themes, albeit in a slightly different manner. He argues that the baby boomer generation has attained a dominant position in society through their accumulation of wealth in housing and other assets. Moreover, other developments such as free tertiary education and relatively stable and prosperous economic conditions underpinned this accumulation of wealth. This generational imbalance could be addressed, at least in part, by persuading baby boomers to hand back some of these resources. Recycling housing wealth through mechanisms such as reverse mortgages could, is a potentially important if not the most important vehicle through which such redistribution could be executed.

Of course, such a rebalancing between public and private welfare is not one that will be easily achieved. It is nonetheless a conversation that arguably should be initiated. The analysis in this report provides impetus to such a conversation by providing evidence around the important relationship between intergenerational transfers, housing outcomes and the distribution of wealth. Moreover, any such moves should necessarily take into account the potential equity implications of encouraging transfers in this way. As the analysis in Chapter 6 made clear, intergenerational transfers have the potential to exacerbate existing wealth inequalities.

8   CONCLUSIONS AND FURTHER RESEARCH

The analysis in this report has sought to provide evidence on the relationship between intergenerational transfers and housing-related outcomes. In doing so, three separate but nonetheless related analytical exercises have been presented. These shed light on how intergenerational transfers impact on housing outcomes, and the relationship between transfers and measured inequality.

The analysis in Chapter 4 focused on the tenure outcomes in wave 10 of the HILDA data. The findings build on and confirm the results in the Positioning Paper on the importance of intergenerational transfers on housing outcomes. While bequests are often received after making a transition into home ownership, they nevertheless help support a higher rate of home ownership among recipients than would otherwise be the case. This result could be due to increasingly precarious home ownership 'careers', with inheritances helping those who have fallen off the home ownership ladder to bounce back. Bequests are also strongly correlated with outright ownership. It would seem that some recipients fold their windfall gains into housing by paying down mortgages.

The analysis in Chapter 4 suggests that gifts play a somewhat different role compared to inheritances. The former reach individuals who are younger and less well positioned as far as achieving home ownership is concerned. It is likely that gifts are deliberate transfers that are designed to alleviate borrowing constraints, and especially deposit requirements. They therefore have a marginally larger effect on home ownership status, despite being of smaller value than bequests. However, they also have a significant effect on transitions into mainstream home ownership and, as expected, their effect is much smaller than bequests; the latter are more influential in this respect and therefore play a bigger role in facilitating housing wealth accumulation.

The analysis of first-time home buyers (Chapter 5) also identifies the important association between intergenerational transfers and housing outcomes. The receipt of bequests, for example, is associated with a doubling of the hazard or conditional transition into first-time home ownership. Similarly, the receipt of large bequests also increase the likelihood that an individual or couple transitions into home ownership for the first time. The analysis suggests that intergenerational transfers impact on housing outcomes for first-time buyers along at least two dimensions. First, as noted, they tend to accelerate transitions into the ownership tenure; second, they tend to increase the amount paid for housing rather than being used to limit the size of the loan taken out.

The final piece of analysis focuses on the effect of transfers on the distribution of wealth. This analysis is particularly pertinent given the central role played by housing in the accumulation of wealth for Australian households and the potential for transfers to facilitate home ownership. The evidence presented suggests that intergenerational transfers over the period 2002 to 2010 have tended to increase inequality. Moreover, there is evidence that those in rental tenures are less likely to receive transfers and benefit from the increased opportunities that come with such transfers.

The analysis in this report has a range of policy implications. Importantly, many of these relate to tax and transfer policies that successive governments have quarantined from changes that might be seen as appropriate given the findings in this report. For example, if there is concern about the increasing concentration of wealth in part facilitated by intergenerational transfers and their role in providing opportunities in housing markets, then sound arguments may be made that some form of wealth taxes are appropriate. The removal of death and gift duties in the 1970s and the reluctance to revisit such taxes mean policy moves along these lines are unlikely. Similarly, there appears to be a broad consensus that the preferential treatment of

owner-occupied housing in the tax and transfer system will remain in place for the foreseeable future.

Notwithstanding these limitations, the findings in this report suggest that there is scope for considering how transfer policies may be better targeted. It would appear that some individuals and households benefit, at least in terms of housing outcomes and accumulation of wealth over time, from intergenerational transfers. This presents an opportunity for more targeted policies that are directed at those who are less likely to benefit from such transfers.

More generally, the findings in this report provide an opportunity to initiate a wider discussion about the welfare role played by housing. The Baby Boomer generation has benefited from relatively good post-war economic conditions which underpinned increasing rates of home ownership and the accumulation of wealth through an asset that had preferential tax treatment. But this has seemingly been at the expense of their children's home ownership prospects. In 2011, roughly 3 in 4 persons aged 55 years or over were owner-occupiers, but only 1 in 3 *persons* under 35 years of age were home owners in that same year. Moreover, rates of home ownership in this young age group are 22 percentage points lower than they were nearly 30 years ago in 1982.

Housing wealth now occupies a different position in household wealth portfolios, as innovation in mortgage products have made it fungible in ways not previously possible for earlier generations of home owners. The cash transfers that some children are now receiving from their parents are a likely manifestation of housing wealth's newly fungible nature. Given the importance of housing wealth in the average Australian's wealth portfolio, it seems likely that some, if not most, of these intergenerational transfers are funded by parents using flexible mortgages to tap into their housing wealth. It appears as if these transfers are invariably targeted on younger households that have yet to achieve home ownership; and our findings suggest that they succeed in significantly lifting home ownership prospects among the younger generation of Australians who receive them. This recycling of housing wealth needs to be thoroughly documented in further research. It is a potentially important channel for the transmission of intergenerational wealth inequalities and could potentially substitute, in some dimensions, for public transfers and perform a private welfare role.

Although relatively novel in an Australian context, there are a number of ways in which the analysis in this report could be extended. Perhaps the most obvious manner is by incorporating in a robust manner the value of in-kind transfers. It is well documented that an important means by which parents can assist children is through co-residence in the parental home. By remaining in the parental home, an opportunity is provided to younger individuals to accumulate savings and thereby facilitate entry into the housing market. The analysis in this report has not considered the value of such transfers. Given the household information available in HILDA, such information could potentially be included in future analysis.

The continued collection of the HILDA data also provides ready means by which the analysis in this report could be extended. With the release of wave 14 HILDA, an additional wealth module will become available for analysis. Importantly this will provide an opportunity to consider how wealth has been impacted in the post-GFC period. Moreover, it will also provide additional data that can be applied in the duration analysis reported in Chapter 5.

There are also other opportunities that are worthy of flagging with respect to future research. One clear finding in the present analysis is that the effect of *inter vivos* parental transfers or gifts is somewhat different to bequests. This reflects differences in their magnitude, but also their timing. It is possible that parental transfers are motivated and specifically tied to housing outcomes for the recipients. Identifying the motivation of the transferors would be useful and could potentially be asked in the HILDA data collection. Such a question could, for example, be posed to the recipient. In a similar vein, additional information about the inheritance of property would provide additional opportunities to gain insight into how intergenerational transfers

impact on housing outcomes. Such a question could be asked retrospectively and provide important insights into how housing outcomes are influenced by intergenerational transfers over time.

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APPENDIX: PROPENSITY SCORE MATCHING MODELS—VARIABLE DESCRIPTION

Table A1: Description of variables included in probit regression model to estimate the propensity score

	Heading text In Table	
	Male	Binary
	Person born in English speaking country	Binary
	Person born in non-English speaking country	Binary
	Father in paid employment went respondent was 14	Binary
	Father not in paid employment went respondent was 14	Binary
	Father's highest qualification in wave 10— University	Binary
	Father's highest qualification in wave 10— Tafe	Binary
	Mean age	Continuous
	Mean no. of dependent children	Continuous
	Mean no. of siblings	Continuous
	Mean % of waves Separated	Continuous
	Mean % of waves Divorced	Continuous
Demographics	Mean % of waves Widowed	Continuous
	Mean % of waves Married/De facto	Continuous
	Mean % of waves employed	Continuous
	Mean % of waves unemployed	Continuous
	Mean % of waves underemployed	Continuous
	Mean % of waves couple, no child	Continuous
	Mean % of couple with dependent child	Continuous
	Mean % of waves couple with nondependent child	Continuous
	Mean % of waves lone parent with dependents	Continuous
	Mean % of waves lone person	Continuous
	Mean household disposable income ($), ten thousands	Continuous
	Mean % of was employed full-time	Continuous
	Mean % of waves with postgraduate degree	Continuous
Labour market and human capital	Mean % of waves with graduate diploma	Continuous
	Mean % of waves with Bachelor degree	Continuous
	Mean % of waves with Advanced Diploma/Diploma	Continuous
	Mean % of waves with Certificate	Continuous
	Mean % of waves Year 12 or lower	Continuous
	Mean % of waves living in VIC	Continuous
	Mean % of waves living in QLD	Continuous
	Mean % of waves living in SA	Continuous
Geography	Mean % of waves living in WA	Continuous
	Mean % of waves living in TAS	Continuous
	Mean % of waves living in NT	Continuous
	Mean % of waves living in ACT	Continuous
Mental health	Mean life satisfaction (out of 10)	Continuous

Note: Mean % of wave estimates are based on mean characteristics for waves preceding receipt of bequest or parental transfer.

Table A2: Coefficient estimates of probit regression model to estimate probability of receiving a bequest between waves 2–10

	25–65-year olds	25–45-year olds
Male	-0.140***	0.043
	(0.050)	(0.079)
Person born in English speaking country	0.040	0.241
	(0.069)	(0.116)**
Person born in non-English speaking country	-0.609***	-0.713
	(0.088)	(0.162)***
Father in paid employment went respondent was 14	-0.031	-0.137
	(0.129)	(0.243
Father not in paid employment went respondent was 14	-0.025	-0.120
	(0.181)	(0.301)
Father's highest qualification in wave 10—University	0.147**	0.203
	(0.066)	(0.090)**
Father's highest qualification in wave 10–Tafe	-0.019	-0.054
	(0.056)	(0.084)
Mean age	0.008***	-0.013
	(0.002)	(0.007)*
Mean no. of dependent children	-0.038	0.035
	(0.039)	(0.063)
Mean no. of siblings	-0.020*	-0.015
	(0.011)	(0.022)
Mean % of persons (waves) Married/De facto	-0.234	-0.469
	(0.162)	(0.271)*
Mean % of waves Separated	-0.174	-0.948
	(0.183)	(0.549)*
Mean % of waves Widowed	0.268	
	(0.221)	Omitted
Mean % of waves Divorced	0.100	0.264
	(0.116)	(0.279)
Mean % of waves employed	0.135	0.085
	(0.103)	(0.187)
Mean % of waves unemployed	-0.420	-0.371
	(0.270)	(0.374)
Mean % of waves underemployed	-0.056	-0.017
	(0.176)	(0.278)
Mean % of waves couple, no child	0.385	0.642
	(0.255)	(0.377)*
Mean % of couple with dependent child	0.415	0.269
	(0.255)	(0.344)
Mean % of waves couple with nondependent child	0.368	0.072
	(0.253)	(0.343)

	25–65-year olds	25–45-year olds
Mean % of waves lone parent with non-dependent child	0.159	0.004
	(0.266)	(0.429)
Mean % of waves lone parent with dependents	-0.001	-0.309
	(0.237)	(0.335)
Mean % of waves lone person	0.007	-0.144
	(0.214)	(0.295)
Mean household disposable income ($), ten thousands	-0.041***	-0.046
	(0.007)	(0.012)***
Mean % of was employed full-time	0.031	-0.182
	(0.090)	(0.157)
Mean % of waves with postgaduate degree	0.132	0.003
	(0.121)	(0.246)
Mean % of waves with graduate diploma	0.189**	0.013
	(0.095)	(0.176)
Mean % of waves with Bachelor degree	0.205***	0.259
	(0.073)	(0.117)**
Mean % of waves with Advanced Diploma/Diploma	0.144*	0.135
	(0.080)	(0.138)
Mean % of waves with Certificate	0.030	-0.002
	(0.066)	(0.112)
Mean % of waves Year 12 or lower	0.041	-0.056
	(0.076)	(0.119)
Mean % of waves living in WA	-0.180**	-0.264
	(0.085)	(0.142)*
Mean % of waves living in VIC	-0.042	-0.045
	(0.058)	(0.090)
Mean % of waves living in QLD	-0.055	-0.170
	(0.061)	(0.097)*
Mean % of waves living in SA	-0.028	-0.080
	(0.081)	(0.132)
Mean % of waves living in TAS	-0.054	-0.020
	(0.127)	(0.191)
Mean % of waves living in NT	-0.325	-0.514
	(0.303)	(0.499)
Mean % of waves living in ACT	0.346***	0.324
	(0.130)	(0.196)*
Mean life satisfaction (out of 10)	0.054***	0.049
	(0.020)	(0.034)
Constant	-1.845***	-0.872
	(0.301)	(0.504)*

Notes: *** significant at 1 per cent; ** significant at 5 per cent; * significant at 10 per cent.

Figure A1: Balancing diagnostics under radius matching with caliper (0.005) algorithm for bequest recipients aged
(a) 25–65
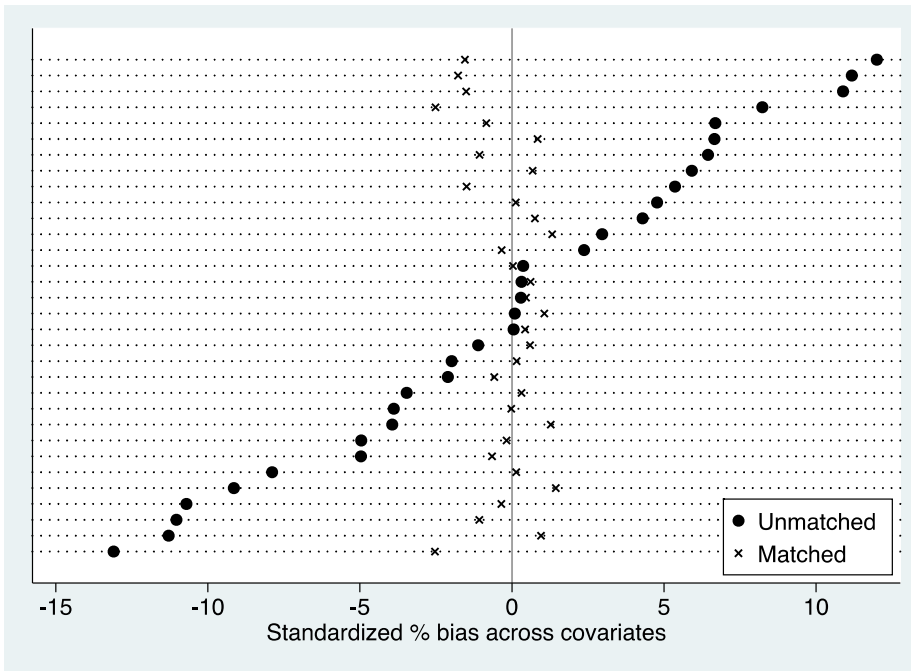
Note: Figure A1 illustrates the performance of the radius matching algorithm as measured by the standardised bias test. The figure plots the standardised percentage bias both before and after matching across each of the covariates entered into the probit model. It can be seen that the radius matching method successfully reduced the percentage bias in all of the key covariates in the probit regression model. The quality of the matched sample is seconded by the t-tests for equality of means, which suggests insignificant differences in means across all of the covariates in the matched sample.[19]

(b) 25–45
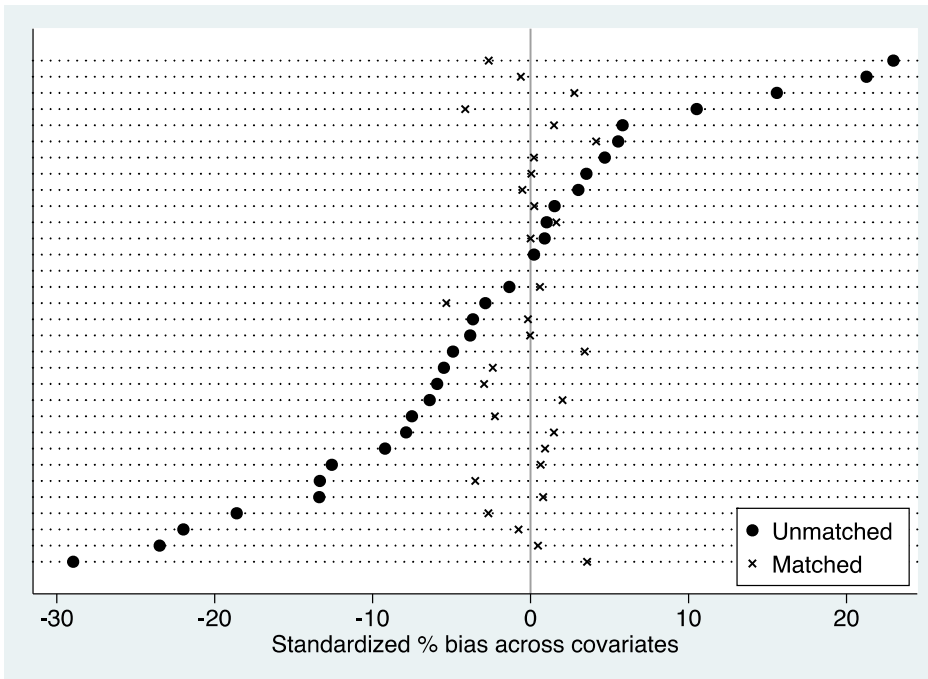
Note: See above.

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[19] Results from the t-test equality of means is available from the authors upon request.

Table A3: Coefficient estimates of probit regression model to estimate probability of receiving a parental transfer between waves 2–10

	25–65-year olds	25–45-year olds
Male	-0.181	-0.123
	(0.065)***	(0.080)
Person born in English speaking country	0.011	0.022
	(0.100)	(0.140)
Person born in non-English speaking country	-0.249	-0.325
	(0.097)***	(0.129)**
Father in paid employment went respondent was 14	-0.195	-0.182
	(0.171)	(0.252)
Father not in paid employment went respondent was 14	-0.229	-0.029
	(0.236)	(0.306)
Father's highest qualification in wave 10—University	0.412	0.278
	(0.073)***	(0.090)***
Father's highest qualification in wave 10— Tafe	0.070	0.067
	(0.071)	(0.085)
Mean age	-0.030	-0.048
	(0.003)***	(0.008)***
Mean no. of dependent children	-0.002	-0.035
	(0.051)	(0.075)
Mean no. of siblings	-0.076	-0.058
	(0.019)***	(0.025)**
Mean % of persons (waves) Married/De facto	-0.386	-0.536
	(0.183)**	(0.249)**
Mean % of waves Separated	0.335	0.505
	(0.237)	(0.414)
Mean % of waves Widowed	-0.071	
	(0.459)	(omitted)
Mean % of waves Divorced	0.004	-0.011
	(0.180)	(0.369)
Mean % of waves employed	0.264	0.133
	(0.140)*	(0.191)
Mean % of waves unemployed	-0.023	0.113
	(0.300)	(0.341)
Mean % of waves underemployed	0.032	-0.375
	(0.205)	(0.279)
Mean % of waves couple, no child	0.136	0.454
	(0.269)	(0.342)
Mean % of couple with dependent child	0.047	0.184
	(0.253)	(0.296)
Mean % of waves couple with nondependent child	0.126	-0.231
	(0.260)	(0.322)

	25–65-year olds	25–45-year olds
Mean % of waves lone parent with non-dependent child	-0.752	-0.342
	(0.352)**	(0.409)
Mean % of waves lone parent with dependents	-0.785	-0.873
	(0.268)***	(0.335)***
Mean % of waves lone person	-0.392	-0.233
	(0.221)*	(0.267)
Mean household disposable income ($), ten thousands	-0.061	-0.048
	(0.010)***	(0.013)***
Mean % of waves employed full-time	-0.186	-0.283
	(0.117)	(0.160)*
Mean % of waves with postgaduate degree	0.360	0.324
	(0.154)**	(0.232)
Mean % of waves with graduate diploma	0.193	0.239
	(0.132)	(0.180)
Mean % of waves with Bach. degree	0.340	0.358
	(0.094)***	(0.124)***
Mean % of waves with Advanced Diploma/Diploma	0.153	0.217
	(0.111)	(0.148)
Mean % of waves with Certificate	-0.154	-0.161
	(0.098)	(0.130)
Mean % of waves Year 12 or lower	0.087	0.131
	(0.097)	(0.122)
Mean % of waves living in WA	-0.209	-0.115
	(0.113)*	(0.138)
Mean % of waves living in VIC	-0.055	0.026
	(0.074)	(0.093)
Mean % of waves living in QLD	-0.135	-0.147
	(0.081)*	(0.103)
Mean % of waves living in SA	-0.056	-0.095
	(0.106)	(0.140)
Mean % of waves living in TAS	-0.333	-0.472
	(0.192)*	(0.268)
Mean % of waves living in NT	-0.140	-0.225
	(0.372)	(0.496)
Mean % of waves living in ACT	0.098	0.020
	(0.175)	(0.223)
Mean life satisfaction (out of 10)	-0.020	0.005
	(0.026)	(0.035)
Constant	0.671	0.877
	(0.362)*	(0.503)*

Notes: *** significant at 1 per cent; ** significant at 5 per cent; * significant at 10 per cent.
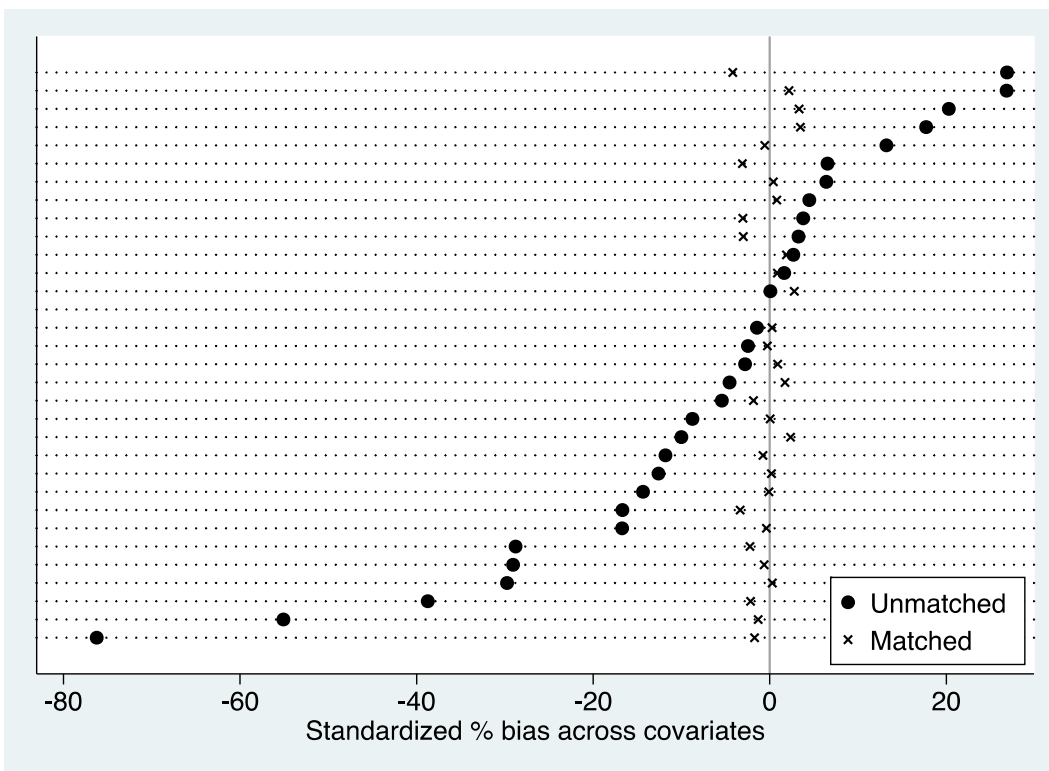
Figure A2: Balancing diagnostics under radius matching with caliper (0.005) algorithm for parental gift/transfer recipients aged

(a) 25–65
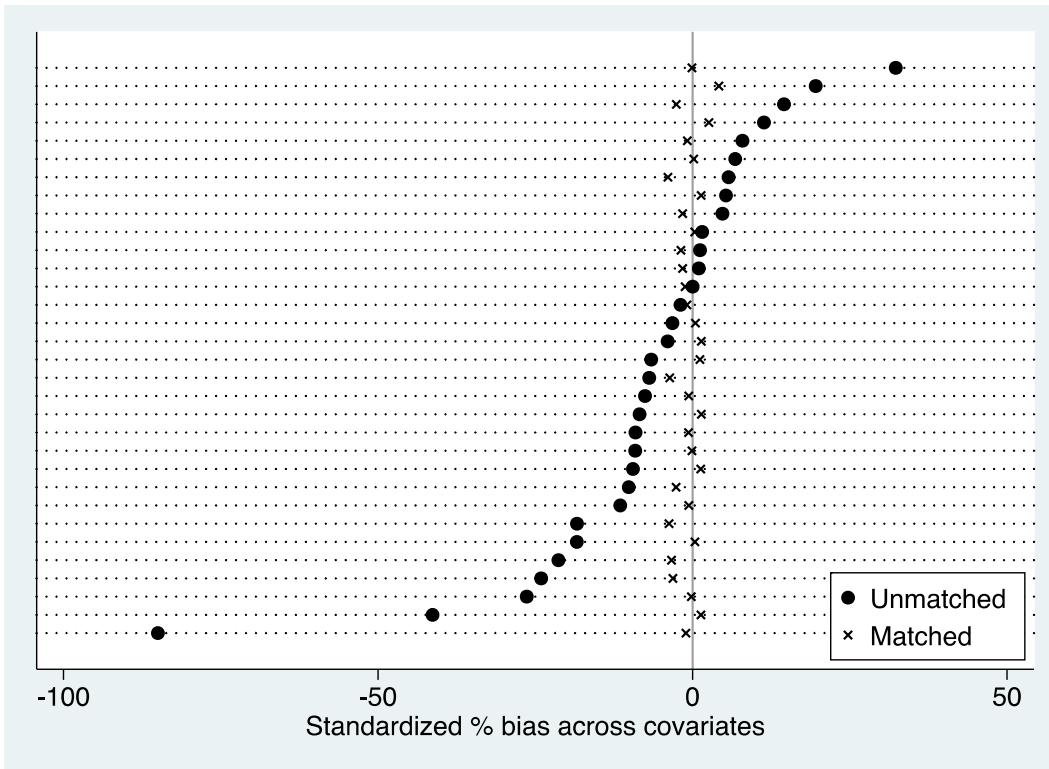
Notes: See above.

(b) 25–45

Notes: See above.

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