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The relationship between intergenerational transfers, housing and economic outcomes

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ACRONYMS

ABS	Australian Bureau of Statistics
AHURI	Australian Housing and Urban Research Institute Limited
DFL	DiNardo, Fortin and Lemieux (1996)
HILDA	Household, Income and Labour Dynamics in Australia
IV	Instrumental Variables
OLG	Overlapping Generations
PSID	Panel Study of Income Dynamics
PSM	Propensity Score Matching

EXECUTIVE SUMMARY

As house prices in Australia have increased, concern has been expressed about the ability of young Australians to attain home ownership. In August 2014, for example, the proportion of all mortgage financed dwelling transactions that were purchased by first home buyers was approximately 11.8 per cent, the lowest share since statistics began being collected in the early 1990s. Anecdotal evidence suggests that one means by which home ownership is facilitated is through intergenerational transfers from parents to their children. While International evidence indicates that home ownership is positively associated with *inter vivos* transfers and bequests, there is little Australian evidence about this relationship.

This research addresses three distinct but related questions around intergenerational transfers (*inter vivos* gifts and bequests), housing outcomes, and related economic outcomes.

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* (financial and in-kind) 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 attainment of home ownership has significance beyond the strong ethos associated with it in the Australian social context. Home ownership has traditionally represented an important vehicle for accumulating savings and wealth. Moreover, the tax and transfer system has features that encourage individuals and households to accumulate housing wealth. Over time, if younger Australians were to be excluded from the housing market; there could be important implications for the accumulation of wealth and, in turn, impact on the sustainability of tax and transfer programs. More generally, inequalities in the generation and distribution of wealth may arise if some groups are systemically excluded from housing markets.

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. In addition, 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.

Existing literature that examines the relationship between intergenerational transfers and housing outcomes offer mixed evidence. It is important to emphasise that the evidence is largely international in nature and reflects the institutional and social context in which transfers occurs. Hence, the findings are not necessarily directly relevant to the Australian context. Notwithstanding this, it is clear that across many countries parents make transfers to their children on a regular basis. In the United States, there is evidence that such transfers are often tied to home ownership decisions. In the case of Europe, the evidence is more mixed. While some research indicates a close relationship between intergenerational transfers and housing outcomes in Italy, for example, the evidence is less compelling in some Nordic countries such as Denmark. For Australia, there is only limited evidence available on how intergenerational transfers are associated with housing outcomes. One study, for example, found that around 5.5 per cent of individuals report receiving assistance to purchase a home in the previous 10 years.

The framework in this research is economic in nature. While somewhat stylised, the methodology facilitates the analysis of behaviours across a range of dimensions. For example,

intergenerational transfers may influence both the quantity and timing of home ownership along with related behaviours such as savings. The economic approach provides a structured way to analysing these and related outcomes.

The empirical analysis uses the Household, Income and Labour Dynamics in Australia (HILDA) dataset, 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. A key benefit of the HILDA data is that its longitudinal nature allows the use of well-developed statistical methods to empirically model the relationships of interest in a robust manner.

Descriptive analysis indicates that, on average, around 6 per cent of HILDA respondents reported receiving a parental gift/transfer in any given year between 2002–12, while approximately 1.4 per cent reported receiving a bequest. However, the magnitude of bequests are substantially larger: over the same period, the mean amount of bequests received was in the order of $80 000 while the amount of gifts/transfers amounted to around $9000.

Tenure choice regression models were estimated via a probit model to determine the role that transfers play in influencing tenure choice. Preliminary results suggest that there is evidence that *inter vivos* transfers and bequests are important factors affecting tenure outcomes (home ownership with and without a mortgage). Probit regression estimates indicate that receipt of bequests in the previous 10 years increased the likelihood that individuals attained home ownership in wave 10—either with or without a mortgage or outright home ownership—by 2–4 percentage points. Preliminary findings also indicate that the chances of being observed in home ownership are positively related to the size of the bequest received. An average bequest of $85 000, for instance, is expected to increase the likelihood of being observed in home ownership by around 3.4 percentage points.

On the other hand, model specifications that include the receipt of gifts or the value of gifts seem to be 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. This may be due to the low value of gifts that are not intended to facilitate beneficiaries' entry into home ownership. There is, however, evidence of positive associations between the amount of gifts received and advancement in tenure status.

Subsequent analysis will more rigorously analyse the data by exploiting the panel nature of HILDA by estimating models capturing the dynamic nature of transitions into home ownership. Greater comparability between transfer recipients and non-recipients can be achieved by using quasi-experimental techniques like the propensity score estimator, which deals with the non-random distribution of parental transfers. In addition, the role of transfers (*inter vivos* gifts and bequests) on the distribution of wealth in Australia will be analysed.

The analysis seeks to 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. In addition, the analysis will provide insight into tax and transfer policies designed to facilitate home ownership and enhance social welfare.

1 INTRODUCTION

1.1 Motivations and aims of the project

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. A concern that has arisen out of this development is the impact on the housing careers of Australians, especially younger Australians. 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).

Recent concern over the affordability of housing is particularly acute in markets such as Sydney and Melbourne, both of which have experienced sustained increases in house prices notwithstanding the moderating effect of the Global Financial Crisis. It is the case that there remains some debate about the exact role of supply and demand factors in driving the increase in house prices in these markets. For example, the Reserve Bank of Australia has 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). 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. In August 2014, the proportion of all mortgage financed dwelling transactions that were purchased by first home buyers was approximately 11.8 per cent, the lowest share since statistics began being collected in the early 1990s (ABS 2014; Bloxham et al. 2010).

The decline of first time buyers in the housing market is particularly significant given the role that housing plays in the Australian economy. Beyond the strong ethos that home ownership represents the ‘great Australian dream’, home ownership has traditionally represented an important vehicle for accumulating savings and wealth. Arguably, the tax and transfer system has recognised this and encouraged individuals and households to accumulate housing wealth. Over time, if younger Australians were to be excluded from the housing market, there could be important implications for the accumulation of wealth and, in turn, 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 Boom’ 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).

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 offset higher prices. Indeed, there is some evidence that parental transfers have become more important vehicles by which younger cohorts can enter into home ownership. To date, however, evidence that intergenerational transfers are important remains largely anecdotal (Anonymous 2014; Drury 2014).

If intergenerational transfers are important for housing careers, this has important implications on a number of economic, social and policy dimensions. First, intergenerational transfers could 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 of transfers get the opportunity to enter home ownership earlier in housing careers, and are thereby able to accumulate more wealth (through a tax advantaged asset) than younger cohorts in less wealthier 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, parents provide transfers to their offspring. Alternatively, a reduction 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 over time.

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* (financial and in-kind) 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?

1.3 Methodological approach

The analysis in this research is economic in nature. Hence, it considers the behaviours and outcomes of interest using an economic model that provides a framework for identifying the likely implications of intergenerational transfers. While somewhat stylised, the strength of the economic framework is that it provides a structured approach to considering how individuals or households respond when they receive or anticipate receiving an intergenerational transfer. In turn, it is possible to develop and estimate empirical models that attempt to quantify the impact of transfers on outcomes of interest. In this project, those outcomes of interest include tenure choice, savings behaviour, and the amount or level of housing consumed.

The analysis will use the Household Income and Labour Dynamics in Australia (HILDA) dataset. The HILDA data is longitudinal in nature so that the same households and individuals are interviewed repeatedly over time. Importantly, this provides the opportunity to examine a variety of behaviours of interest including tenure choice, transitions between tenures and changes in the distribution of wealth over time.

In addition to a descriptive analysis of data, there are three key statistical methodologies that are employed in the analysis.

The first approach identifies the effect of transfers on behaviours or outcomes of interest using a series of econometric models. These models allow the impact of intergenerational transfers on outcomes of interest to be identified, *ceteris paribus*. That is, *holding other things constant*, how does the receipt of a transfer impact on the behaviour or outcome of an individual holding all other factors constant? Such an approach is important because it is generally believed that decisions around housing tenure and related outcomes depend on a range of factors such as age, income and marital status. The statistical approach in this report will attempt to 'net out' the impact of these other considerations on observed behaviours or outcomes and thereby isolate the effect of transfers on the outcomes of interest.

The statistical techniques available for this analysis are well developed. Regression models are commonly used to identify the statistical relationship between outcomes such as tenure choice and its determinants such as household size, age of the household head, household income and the receipt or value of transfers.[1] While regression analysis represents a powerful statistical tool, there are also a number of challenges associated with identifying the relationships of interest. In the social sciences it is generally impossible to undertake randomised experiments allowing for well-defined treatment and control groups. This can pose challenges when identifying the relationships of interest, and there are a well-developed set of tools available to address such problems. One such tool is the Propensity Score estimator which is a quasi-experimental technique that deals with the non-random allocation of a treatment or, in this case, a bequest or gift (hereafter referred to as the treatment group), in a way that is statistically robust. Commonly used in the medical sciences, the propensity score method ensures the comparability of treatment recipients and non-recipients by eliminating the effect of confounding influences, such as the number of children in a household, on the allocation of bequests/gifts. It is conceivable that a child with fewer siblings is more likely to receive a transfer from parents as the parents are less able to assist when there is a large number of children in a household. Other factors, such as parents' age or wealth standing may also impact on the probability of receiving a transfer and therefore must be statistically accounted for to achieve an unbiased estimate of the effect of a transfer on housing outcomes. The propensity score method can achieve comparability between transfer recipients and non-recipients by allowing us to construct a counterfactual sample that mimics the treatment group in all relevant characteristics save for the receipt of a transfer. Having identified a suitable counterfactual sample, regression analysis can then be performed on the matched treatment and counterfactual group to more precisely estimate the effect of a parental transfer on housing outcomes.

The final part of the analysis in this research will use the HILDA data to examine inequality. Summary measures of inequality including the coefficient of variation and Gini coefficients will be compared across households that do and do not receive transfers. Further, inequality in net wealth will be decomposed into that attributable to bequests and that attributable to the distribution of net worth excluding bequests.

Some preliminary results from the analysis are presented in Chapter 5 of this Positioning Paper. Those results indicate that there is evidence that *inter vivos* transfers and bequests are

[1] There are a number of studies that estimate Australian tenure choice models (Bourassa 1995; Bourassa & Yin 2006; Hendershott et al. 2009), though transfers have not been included in model specifications.

important factors affecting tenure outcomes. The subsequent analysis to be undertaken will more rigorously analyse the data by exploiting its panel nature.

2 CONCEPTUAL FRAMEWORK

The analysis in this project is economic in nature. Thus the conceptual framework guiding the analysis and methodological approach draw on economic theory. In doing so it is important to note the following.

The economic approach to studying behaviour and outcomes is highly stylised. Economic agents, either individuals or households, are assumed to behave in a certain way. In essence, the approach is to argue that individuals 'optimise' or make the best possible choices subject to the constraints they face. In this setting, interest is generally focused on how behaviour and outcomes change when the constraints that agents face are altered. The constraints that such models focus on are those that are generally considered 'economic'. For example, decisions about what an agent consumes is constrained by how much income they have available and the prices of the goods that they wish to consume. If either of these 'economic variables' change, then we would expect behaviour to change. This approach represents the very essence of the economic approach to understanding behaviour.

The models are generally somewhat simplified abstractions of what is happening in the real world, though this has the advantage of making economic models a rich source of testable hypotheses. Despite a focus on what are generally identified as the economic variables of interest, the approach provides a powerful means by which to analyse behaviours of interest.

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. Utility can simply be considered a measure of well-being or satisfaction where that well-being is derived from consumption of certain goods. 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.

While agents would like to consume as much as possible, they are generally constrained from doing so. 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 identify total expenditure on a good as simply the quantity of the good consumed multiplied by its price. For example, if p_c is the price of an item of clothing and c the quantity of clothing consumed, total expenditure on clothing is equal to $p_c \cdot c$. In a similar manner, it is possible to identify total expenditure on housing (h) and food (f), where we assume that these are the only other goods relevant to utility. We can then think of the economic agent's problem as that of maximising utility subject to their budget constraint. Put another way, the challenge is to choose quantities of food, clothing and housing so as to maximise utility subject to the budget constraint. More formally, we can write the following problem:

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

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

where x represents the bundle of food, clothing and housing consumed. The solution to this problem provides insight into the behaviour of agents, in particular the quantities of food, clothing and housing that they chose to consume. Further, by changing economic variables, such as the prices of goods or the level of the agent's income, it is possible to identify how behaviour changes when these 'economic variables' change.

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. Each of these represents valid criticisms, and the model described above can be generalised in ways that incorporate many of the real world considerations likely to be important, such as the availability of many goods, and saving with a view to increasing consumption in the future.

2.2 A life-cycle model

As a person's life cycle unfolds, various key biographical events—entry into the workforce, marriage, the birth of children, retirement—signal important life transitions that help shape housing-related decisions. In general, individuals initially live with parents and are dependent on them. After education has been attained, they often become financially independent and form their own households. This may coincide with partnering and the purchase or rental of housing services. In turn, they may have children of their own and, after a period of work, retire.

This description captures in a very general way the 'life-cycle' model. Arguably, as economic agents age, the decisions open to them alter, as do their behaviours. These changes across the life-cycle affect preferences or utility, as well as the constraints they face. In most cases, it is clear that for agents the consumption of goods or services that provide utility when they are children are substantially different to those they enjoy as a working adult or a retired individual. Similarly, as individuals age, the income and other resources available to them vary so that the constraints they face also change. The life-cycle model attempts to capture these important changes and identify the implications for economic behaviours and outcomes.

2.2.1 A simple multi-period model

The simplest way to extend the basic model described in Section 2.1 incorporates life-cycle considerations into a two or more period model. For example, suppose that agents live for two periods, $t = 0 \textit{ and } t = 1$.[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, which we can refer to as retirement, individuals do not work and the amount of resources available for consumption might simply consist of earnings from accumulated saving and the savings themselves. Hence, an important issue in such a model would be to consider how much savings are accumulated. More generally, 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:

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

[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 gaining education.

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 intertemporal budget constraint simply requires that lifetime consumption is less than or equal to lifetime income. Consumption can be brought forward from the second period to the first by borrowing, or deferred to the second period by saving. In both cases of borrowing and saving, an interest rate of r applies.

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 is available in t=1 to help maintain levels of consumption of other goods (by holding a lower amount of housing assets). While housing services can be purchased like other services in the rental market, home ownership generally requires large lumpy expenditures followed by a stream of housing services derived in future periods. For economic agents constrained by their current level of income, such expenditures generally require borrowing in capital markets followed by repayment of loans in future periods. The large purchase made in the current period is made possible by the borrowing in the current period and repaying the debt in future periods.

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. While this feature of capital markets and its implications is discussed extensively in the literature (Linneman & Wachter 1989; Linneman et al. 1997; Zeldes 1989), it is not the focus of this research. It does nonetheless highlight how economic models of behaviour can be generalised to incorporate real world constraints that agents face.

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.

2.2.2 An overlapping generations model

In discussing the life-cycle model, it was noted that over the course of their life individuals often form their own households which includes having children. Life-cycle models and, in particular, overlapping generation (OLG) models, can incorporate this important feature of real world economies into the analysis.

Overlapping generation models analyse economies consisting of a series of ‘generations’. For example, at any one 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 savings accumulated while working. In such economies, cohorts progressively age so the young cohort in this period becomes the ‘middle-aged’ cohort in the following period. Similarly, the old cohort ‘die’ in the following period.

The benefit of constructing such a model is that it facilitates the analysis of important transfer behaviours that are the focus of this research. Where 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. Put another way, they may not consume the entirety of their assets in the final period of their life.

The transfers identified may be in the form of *inter vivos* gifts or loans, or they may be associated with bequests. Significantly, such transfers may be motivated by a range of considerations (Laferrère & Wolff 2006). These include concerns around altruism, exchange motives, demonstration effects and insurance motives. Altruistic concerns reflect the fact that in general it is accepted that individuals are anxious about the welfare of family members. Generally, such concerns are particularly pertinent in the context of the relationship between parents and their children, though they may and do extend across other familial relationships. Alternatively, transfers may be made with a view to facilitating a non-market exchange of some form. For example, the care of grandchildren may be motivated by an expectation that children will take care of elderly parents in the later years of their life. Similarly, a direct transfer of resources might be made in expectation that the child will offer care services at later stages in the parent's life. Transfers may also be used as a form of insurance or to circumvent other market failures such as credit market imperfections. When an individual faces an economic shock, such as unemployment or divorce, other family members may provide a transfer that effectively insures against such events. Finally, credit market imperfections that constrain households from borrowing against future wealth may provide an incentive for members of families that are unconstrained to make transfers to those who are constrained (Cox 1987).

The theoretical literature has considered the motivations behind transfers. 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 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 their desired level of 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. Clearly, higher consumption may extend to a higher consumption of housing.

A number of authors (Guiso & Japelli 2002; Mayer & Engelhardt 1996) identify the alternative mechanisms by which intergenerational transfers may impact on housing-related decisions. Households that receive transfers may, for example, substitute transfers for their own savings. Purchase of a home generally requires the accumulation of savings in the form of a down-payment or deposit. A transfer recipient may substitute the transfer for their own savings. Alternatively, they may use transfers to increase the value of the housing consumed by purchasing a larger house or by purchasing the same priced house at an earlier date. 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 in a life cycle model may be anticipated. For example, bequests may be characterised as being anticipated though the exact timing and amount might be unknown. Children may (correctly) expect that parents will make *inter vivos* transfers. Anticipated transfers may have similar effects to those that are unanticipated.

In terms of housing, a household that is credit constrained but is anticipating a transfer may respond by increasing housing consumption if the transfer leads to a relaxation of the credit constraint. In addition, 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 outcomes. If an economic agent anticipates that they will receive a transfer in the

future, it is likely that current behaviour will be affected. 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. In turn, a household that anticipates receipt of an *inter vivos* transfer or bequest may save less in the current period compared to a household that has no such expectation.

It is also important to note that by incorporating bequests and other transfers into an 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. The benefit of the economic approach to modelling behaviour is that it provides a coherent and rigorous framework with which to consider the behaviour of agents and how that behaviour changes when economic circumstances change. We now consider existing evidence on the impact of transfers on outcomes, with particular reference to housing outcomes.

3 LITERATURE REVIEW

This literature review focuses on the empirical evidence around the nature and extent of intergenerational transfers, and their impact on economic outcomes of interest, especially housing. The literature survey focuses on international evidence given the paucity of Australian evidence. Nonetheless, the literature review begins by setting out some relevant information about the Australian context. Such a discussion is important for two reasons. First, it makes clear that the characteristics and magnitudes of intergenerational transfers differ substantially across countries. Perhaps more importantly, the implications of those transfers for individuals and what it means for policy are likely to be heavily dependent on the institutional setting in which those transfers take place. For example, 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.

Hence, understanding how intergenerational transfers are likely to affect housing and related economic outcomes in Australia must take into account the peculiar circumstances in Australia.

3.1 The Australian context

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. Starting at a low of around 53 per cent in 1947, the home ownership rate increased relatively rapidly, reaching 63 per cent in 1954 and then 70 per cent in 1961. Since that time, the home ownership rate has remained stable at around 70 per cent (Kryger 2009). Among home owning households, the proportion with a mortgage has fluctuated over time. For example, around equal proportions of home owning households were with and without a mortgage in 1981 and 2006. In the intervening years however, these numbers fluctuated so that by 2001 over 40 per cent of households were outright owners and less than 30 per cent of households were with a mortgage (Kryger 2009).

It is important to note that other than home ownership, the most important form of tenure is renting in the private market. Traditionally, this tenure has accommodated between 25 and 30 per cent of households. For those who rent in the private rental market and are in receipt of government transfers, such as the unemployed or sole parent households, targeted subsidies are available to assist with the cost of rent. Typically, housing careers have been characterised by one in which individuals leave the family home before moving into rental accommodation, and subsequently ‘upgrading’ into home ownership. The social or public housing sector remains a residual tenure and has become increasingly concentrated among high needs individuals 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. A variety of factors are cited for this precipitous decline, including the presence of an increasing number of investors and dual income childless households in the property market. Low-income older age groups also experienced declining rates of home ownership over the periods 1996–2006. This group appears to have been permanently ‘scarred’ by the poor economic circumstances they experienced in the decade between 1983 and 1993, along with challenges in the housing market such as the high interest rates experienced 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.

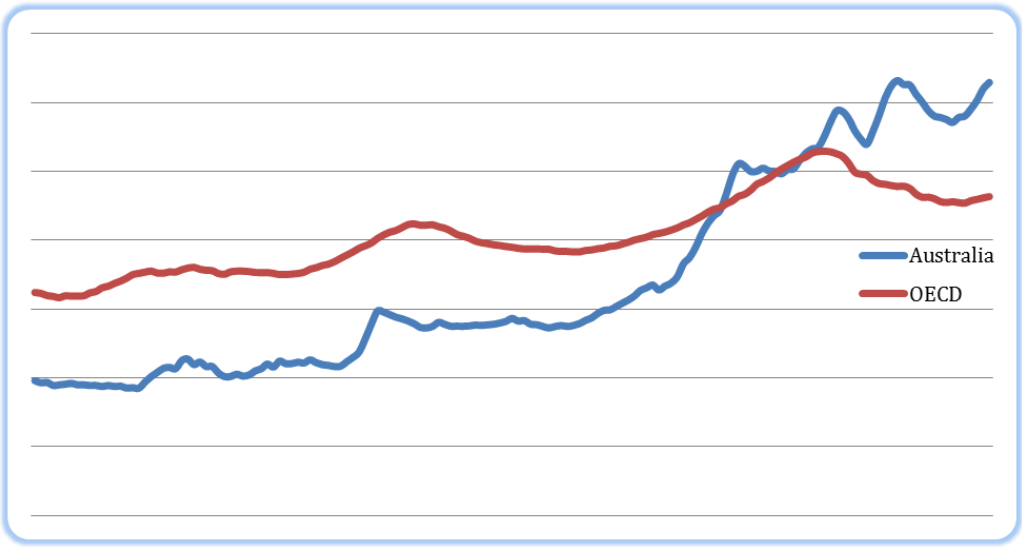
As in other countries, tenure choice in Australia is determined by a range of factors with an important consideration being the accumulation of wealth. Traditionally, housing has represented

the largest component of a household's asset portfolio and the principal savings vehicle for Australian households (Findlay 2010; Headey et al. 2005). While fluctuations in wealth levels may be impacted by changes in assets prices, it is noteworthy that between 2006 and 2010 the share of real estate in asset holdings increased from 54 to 60 per cent. There are sound financial and economic reasons why housing represents such a significant component of household wealth holdings. First, 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). Moreover, government policy has supported home ownership through direct grants and tax relief to first home buyers (Wood, Stewart & Ong 2010).

Of course changes in housing outcomes need to be assessed in the context of wider changes in the socio-demographic and socio-economic space. Like other countries, Australia has experienced demographic changes associated with an ageing population. However, due to immigration policies, population ageing has generally not been as pronounced as those experienced by some other countries. Social changes around norms relating to marriage, education and career have also changed significantly over the past three decades (Flatau et al. 2007). In general, Australians have delayed marriage and fertility decisions, and attained increasing levels of education over time. Concomitant with these changes, the age at which Australians first leave home has begun to increase for the most recent birth cohorts, after steady falls for those born in the early to mid-parts of the 20th century. This delay in departure from the parental home is itself significant as co-residence in the parental home provides significant benefits for young adults to engage in study and respond to economic shocks such as unemployment (Cobb-Clark & Gorgens 2014). Moreover, it may be an important aspect of intra-household transfers that enable the accumulation of savings and entry into the housing market.

The change in tenure status also reflects changing economic conditions faced by households over the past few decades. In this respect, a key feature of Australian housing markets has been the robust and sustained growth in housing prices experienced over time. House price levels in Australia and a number of OECD countries are depicted in Figure 1 below. In general, housing prices in Australia have increased steadily over time with periods such as the late 1980s and early 2000s characterised by rapid acceleration in house prices. Moreover, it is noticeable that the correction associated with the GFC was, unlike some other counties, relatively mild and short lived.

Figure 1: Real House Prices 1975–2012



Source: House prices are from Federal Reserve Bank of Dallas international house price dataset.

It is in the broader context of the developments described above that the issue of transfers has attracted increasing attention. With the increase in house prices over the past decade, some commentators are worried that younger households are being excluded from the home ownership market, particularly in those markets where employment opportunities are strongest (Berry 2008). A number of factors have been cited for this including 'Baby Boomers' with high wealth levels investing in the property market.

3.2 International evidence

3.2.1 The nature and magnitude of transfers

Schoeni (1997) uses the Panel Study of Income Dynamics (PSID) to highlight the extensive and sizable nature of transfers, both *inter vivos* and bequests, that occur across households in the United States. 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. Significantly, he notes that the likelihood that a transfer is received and the amount transferred from parents is positively associated with parental wealth. For example, the amount of funds received for children whose parent's net wealth is $100 000–$250 000 is $1155 greater than that received by the children of parents whose net wealth is $25 000–$150 000. Conversely, for recipients of transfers the incidence of receipt and the amount received is negatively related to household income. Such a finding is consistent with a model in which altruism or insurance considerations motivate the transfer.

Berry (2008) also considers intergenerational transfers in the United States using the American Health and Retirement Survey. His analysis, like Schoeni's (1997), shows that those individuals who receive financial transfers are more likely to be needy and less likely to be home owners. This pattern is consistent with an altruistic rather than an exchange motive on the part of the donor, with parental concern for child outcomes potentially being important determinants of the receipt of transfers.

Some evidence for the nature of intergenerational transfers in Europe is set out in Zissimopoulos and Smith (2011). Using data from the Survey of Health and Ageing in Europe, it was possible to compare the transfer behavior of parents in the United States and Europe. The analysis indicated that in the United States, over a period of sixteen years parents gifted to all of their children an average of over $37 000. While the average child received over $11 000, a child in the top 5 per cent of the distribution received over $54 000. The amount transferred to children on an annual basis in the United States was approximately 50 per cent higher than in Europe. In Europe, the average annual amount that parents gifted to children was around €1000 or €420 per child. Significantly, Zissimopoulos and Smith (2011) note that transfer behavior varies across European countries. Approximately 16 per cent of parents gifted money to children in Italy compared to 27 per cent of parents in Sweden. Part of the explanation for the difference between transfer behavior in the United States and Europe, and within European countries, appears to reflect variation in 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 suggest that public expenditures crowd out interfamilial transfers.

In terms of housing, Zissimopoulos and Smith (2011) argue that if transfers are intended for housing, then the size of the mortgage market may be correlated with variation in the amount of transfers given to children across countries. The analysis suggests, however, that the amount of transfers is positively related to the size of the mortgage market and does not appear to be an important determinant of parental transfers. Importantly, Zissimopoulos and Smith (2011) 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. However, it was also noted that to the extent that such transfers facilitated education, it was

possible that such transfers may impact on inequality if those transfers lead to higher lifetime wealth for recipients.

There is also some direct evidence of transfers facilitating the purchase of housing. Using a sample of Irish first home buyers, Duffy and Roche (2007) find that between 2000–04, around one-third of households receive an *inter vivos* transfer and the transfer represented 21 per cent of the down payment. For the United States, Engelhardt and Mayer (1998) use a sample of recent home buyers, which includes both first-time and repeat buyers, and report that around 22 per cent receive transfers targeted towards the purchase of a home, and the average transfer represented around 50 per cent of the down payment required (Mayer and Engelhardt 1996). For Italy, Guiso and Japelli (2002) report that around 16 per cent of individuals report receiving a gift or financial support earmarked for real estate purchase.

3.2.2 The impact of transfers on housing and related outcomes

A number of authors (Guiso & Japelli 2002; Mayer & Engelhardt 1996) identify the various mechanisms by which intergenerational transfers may impact on housing related decisions. Households that receive transfers may, for example, substitute transfers for their own savings. Alternatively, they may use transfers to increase the value of the housing consumed by purchasing a larger house or by purchasing the same priced house at an earlier date. 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 the context of transfers related to housing, Mayer and Engelhardt (1996) argue that the transfers that do occur are a response to credit market constraints faced by first time home buyers. Initially, a set of 'constrained' first-time home buyers is defined who have a down payment of less than 20 per cent and an obligation ratio of greater than 28 per cent of gross income.[4] The obligation ratio in particular is likely to be binding for 'constrained households' which have low current and high future income and would desire to purchase a house larger than is otherwise allowed. The analysis finds that constrained households are more likely to receive gifts or transfers, and the gifts represent a larger share of the down payment compared to unconstrained households.

In a subsequent study, Engelhardt and Mayer (1998) find that recipients of transfers generally spend a shorter period saving for down payments or deposits. Concomitant with this, there is a reduction in their own savings in the order of $0.35 for every dollar in transfers received, highlighting the important substitution effect associated with transfers. Further, there is evidence that the down payment is higher among transfer recipients, and the value of the house purchased is higher, though the entire amount of the transfer is not capitalised into the value of the home purchased.

Boehm and Schlottmann (2001) use the PSID to examine wealth accumulated by young American households and the role played by transfers in this process. Consistent with a range of other studies, they find that children of home owners are more likely to enter into home ownership. Moreover, higher levels of education of children lead 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.

More recent evidence about the effect of gifts or transfers in the United States is provided by Luea (2008) and Withers and Reid (2005). Luea (2008) uses the PSID which was used to identify the impact of inheritances, parental gifts and similar payments on the probability of home ownership. The analysis concludes that those receiving such monetary transfers are 1.2 times more likely to purchase a home compared to non-recipients. The impact is substantially larger

[4] The obligation ratio is defined so that mortgage repayments, property taxes and insurance premiums not exceed 28 per cent of gross income.

for those who receive transfers in excess of $5000. Luea (2008) also uses the PSID in the period 1995–2001 to examine the impact of financial help and gifts on the value of housing for home owning households. Financial help and gifts are described as 'monetary help received from family or friends outside the family unit'. Gifts include substantial monetary gifts or property the household receives. The multivariate analysis indicates that when a household receives a financial gift, housing demand increases by approximately 10 per cent. That is, for an average household, the value of the occupied home increases by approximately $19 000. As a result, financial help or gifts lead to a higher housing cost burden. This suggests that transfers are not used to increase the down payment or reduce the size of repayments, but rather feed directly into higher housing consumption.

Analysis for Europe is more nuanced, reflecting the variety of institutional regimes and social norms across countries. For Italy, Guiso and Jappelli (2002) find that transfers (bequests and *inter vivos* gifts) have only a small impact on the time spent saving for a down payment. Interestingly, they use duration analysis to identify the impact of transfers in their analysis. In effect, the time spent saving before entry into home ownership is modelled. While the effects of transfers appears to be relatively small, 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 France, Spilerman and Wolff (2012) find that parental transfers impact on the likelihood that individuals are home owners and the amount of housing consumed. This increase in the value of housing consumption comes about in part because of the increase in the value of the down-payment, and also because of an impact through higher purchase prices.

Among the Nordic countries, other patterns emerge. Using a large administrative database that contains information on wealth holdings among households in Denmark, Kolodziejczyk and Leth-Petersen (2013) find little evidence that intergenerational transfers are used to support home ownership. There is no evidence that parents transfer resources to children to facilitate home ownership, or insure against labour market shocks around the time that home ownership is entered into. For the Netherlands, around 9 per cent of individuals report receiving financial support for home ownership from parents (Mulder & Smits 2013). Moreover, parental support to facilitate home ownership was positively correlated with parental resources and more likely among individuals who reported that their parents were home owners. There was little evidence, however, that financial support from parents was based on the child's needs. While parental home ownership does have a large impact on monetary support including that for home ownership, there is no evidence that home owners are particularly focused on providing support for ownership *per se*. Helderman and Mulder (2007) similarly found continuities in housing careers across generations, and concluded that gift-giving represented an important part of the intergenerational transmission mechanism.

Yututake et al. (2011) develop a theoretical model describing the interdependence of parental gifts and children's housing investments. The interdependence arises due the strategic nature of transfers. Parents make transfers to assist children's housing prospects with a return in old age, when parents expect to be cared for and/or housed by their children. While a gift might increase housing demand by children, it might also act to decrease housing demand if the gift is associated with caring responsibilities that reduce utility. An empirical model is then estimated using Japanese data that relies on changes in tax policies around gifts designed to encourage investment in housing. The empirical 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, however its net impact is small given expectations of higher care in the future.

Table A1 in the Appendices provides a summary of the key findings identified in the international literature cited above as well as Australian studies covered in the next section.

3.3 Australian evidence

For Australia, evidence on the extent of and impact of transfers is more limited. This is due, in part, to limited data on transfers from parents to their children. One early study (O'Dwyer 2001) used data on deceased estates to examine the frequency with which individuals receive bequests, especially those related to property. Interestingly, he notes that 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. This suggests that the impact of bequests, especially those associated with property, may be less than initially believed.

O'Dwyer (2001) also notes that only one per cent or so of all households receive bequests on an annual basis. Because bequests are divided among living descendants, he argues 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. Hence, it remains the case that the transfers of wealth via bequests may exacerbate existing inequalities over time.

King and McDonald (1999) examine intergenerational transfers using the Australian Bureau of Statistics' *Survey of Families 1992*. The data also provides some information on the provision of gifts or loans for the purchase of property. Though somewhat dated, the analysis is telling. As expected, help 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. Conversely, 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. It is also the case that although inheritances were received by substantially fewer households than other types of monetary transfers, the value of bequests was significantly higher. This reflects in part the large number of relatively small gifts, in the order of $1000, that individuals report receiving on an annual basis.

The evidence in King and McDonald (1999) suggests that inter-household/inter-family transfers are common, and have a potentially important influence on the housing careers of recipients.

4 METHOD

4.1 Data

The analysis in this paper uses the Household Income and Labour Dynamics in Australia (HILDA) data.[5] The analysis in this analysis will use waves one to thirteen of the HILDA dataset collected between 2001 and 2013. The HILDA survey provides information on the characteristics and behaviour of Australian households and individuals who reside in those households over time.[6] The first wave of the HILDA dataset collected in 2001 contains information on approximately 7500 households and over 13 000 responding individuals. Subsequent waves, which have been collected on an annual basis, contain somewhat fewer, though still significant, numbers of observations. To date, 12 waves of data are available from the HILDA dataset with a top-up survey being made available in the most recent waves of data. The HILDA data is a household survey, with each individual in the household asked to complete an in person and self-completed questionnaire.

The HILDA data contains large amounts of detailed information about individuals and households participating in the survey. This includes information on the socio-demographic and socio-economic characteristics and behaviours of individuals; housing related issues such as tenure, value of residential properties and mortgage debt held; and, detailed information on the income and related sources of funds that households receive. For each wave of HILDA, individuals are asked the following question:

> … (D)uring the last financial year did you receive payments from any of these sources? Include both lump sums and more regular payments, but do not include any payments we have already recorded elsewhere.

The options available include '*bequest/ inheritances*' or transfers from '*Parents*'. While this information is used in much of the subsequent analysis, the HILDA dataset is a rich source of data that can be used to understand the nature and extent of intergenerational transfers in Australia.

Finally, it is important to emphasise that the HILDA data is longitudinal in nature and this provides an opportunity to examine the relationship between transfers and the economic outcomes of interest in a comprehensive and rigorous way. In particular, it is possible to observe the behaviour of individuals and households through time following the receipt of transfers.

4.2 Methodological approach

The methodological approach will reflect the economic nature of the analysis proposed and the research questions of interest. Those research questions can be broadly classified into two categories. First, the analysis will attempt to identify the impact of *inter vivos* transfers and bequests on housing and related outcomes. Second, the impact of those transfers on the distribution of wealth will be considered.

Prior to undertaking statistical analysis, a descriptive analysis of the patterns in the HILDA data will be presented. Some initial patterns are reported in Chapter 5 and the Final Report will exploit the panel nature of the HILDA data more fully. For example, it will be possible to document the extent that individuals receive an in-kind transfer by returning to the parental home following major life events such as a relationship breakdown. Similarly, as described in Chapter 4, it is

[5] 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.

[6] For this Positioning Paper, only the first 12 waves of HILDA data are available and used. Wave 13 of the HILDA data will become available in early 2015.

possible to identify how long children remain in the parental home prior to establishing their own household. This and other summary measures of the in-kind transfers received by children from parents will be set out in the Final Report.

In addition a variety of statistical techniques will be used to address the research questions described above. The proposed methodological approaches are similar to those used in the literature described in Chapter 3.

4.2.1 The regression approach

Ideally, investigating the effect of a transfer on behaviour would proceed by undertaking an experiment in which individuals or households are randomly divided into two groups. The first 'control' group would receive no transfer; the second or 'treatment' group would receive a transfer and the effect of a transfer on behaviours or outcomes of interest would be revealed by a simple comparison between to the two groups. However, in the social sciences, such experiments are usually not feasible and consequently alternative methods are applied to identify the relationships of interest.

A common method is the use of regression analysis. Regression models are a statistical method that can be used to identify the effect of a variable of interest on the behaviour of economic agents. A general example is given below:

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

Where Y_i is the outcome of interest such as whether the individual is observed to have owner-occupied tenure; X_i is a set of variables believed to determine the outcome of interest; and, T_i is a measure of whether the individual (denoted by i) receives a transfer (or the value of the transfer) where that transfer may take the form of an *inter vivos* gift or a bequest. The final term, ε_i, represents the disturbance term and represents all those determinants of the outcome that are omitted from the model.

The methodological approach in this research will estimate a series of models that identify the impact of the receipt of a transfer (either in the form of a gift or a bequest) on the outcomes of interest. Those outcomes include:

1. Tenure status, where $Y_i = 1$ if the individual reports being a home owner, and $Y_i = 1$ otherwise.
2. The purchase price of owner occupied housing.
3. The value of the deposit used in the purchase of a home for first home buyers.

The outcomes to be modelled are those that have been identified in the literature as important dimensions that transfers, either in the form of *inter vivos* gifts or bequests may affect housing and related economic outcomes or behaviours.

In each case, the HILDA dataset contains measures of the outcome variable and variables that capture the determinants of the outcome of interest. For example, age, education and family status are all variables that the literature has identified as important determinants of housing and related outcomes. Similarly, HILDA contains information on tenure status; the purchase price of owner-occupied housing; and measures that allow the value of the deposit used in the purchase of a home to be calculated. Recall too that the literature identifies savings as an important aspect of behaviour that transfers might impact. In some waves of HILDA, information is also available on the savings behaviour of individuals, including whether they are saving for a house.

It is important to stress that the exact modelling approach will reflect the outcome of interest. For example, the models of tenure status, preliminary versions of which are reported in Chapter 5, take into account the discrete nature of the outcome. In particular, probit models that reflect the

nature of the tenure status (the individual is either a home owner or not) are estimated and reported.

4.2.2 Transition probabilities and duration models

The HILDA dataset provides an opportunity to analyse the dynamic nature of behaviour and outcomes. There are a number of ways in which this can be done. A simple approach is to consider how economic agents transition from one 'state' to another over time. For example, do households enter into home ownership in the period following the receipt of transfers? Alternatively, does the transition into home ownership occur only after a number of periods have elapsed?

The HILDA data provides a number of opportunities by which such processes can be modelled. The simplest manner, some initial results of which are reported in Chapter 5, simply compare the conditional probability of transition from one state (e.g. rental tenure) into an alternative state (e.g. home ownership). In these models, the process of interest compares 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 $T_{i,t}$ captures 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, is examined.

While a useful first step, the panel aspect of the HILDA allows more general analysis of transitions into various states. This modelling approach, commonly referred to as duration analysis, has been used in Guiso and Japelli (2002). In that paper, the time or duration until entry into home ownership was analysed. In particular, the focus was on the effect of transfers on the time spent saving before entering into home ownership.

The analysis in this project will also consider the likelihood that a household transitions from rental tenure into home ownership with a specific focus on the impact of transfers on the likelihood that the transition is made. A common approach to such analysis is to model the hazard rate or the conditional probability that households transition from one state (e.g. rental tenure) into another (home ownership).

Consider, for example, a set of households that are initially observed to be renting. The time until entry into home ownership can be modelled using a duration model. An approach that provides maximum flexibility in the shape of the hazard function, a proportional hazard model similar to that described in Meyer (1990) and discussed in Lancaster (1990, pp.172–208) can be estimated to describe the time until the household enters home ownership. 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 person n, $h_0(\tau)$ is the 'baseline' hazard common to all individuals, $z_n(\tau)$ 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 time-varying covariates such as the receipt of a gift or bequest.

4.2.3 Wealth decomposition models

Econometric techniques will also be applied to identify how intergenerational transfers affect the distribution of wealth.

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. For example, the distribution of wealth in Australia in 2010 $f^{2010}(W)$ can be expressed as the product of the distribution of wealth in 2010 conditional on the attributes of the population $f^{2010}(W|x)$ times the distribution of attributes across the Australian population in 2010 $h(x|t = 2010)$. This formulation of the wealth distribution is particularly useful for making comparisons of distributions, and decomposing those distributional differences, and for constructing hypothetical or 'counterfactual' distributions to gauge the influence of different attributes. 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 not change, or change in different ways. For example, the counterfactual wealth distribution in 2010 that may have prevailed if the distribution of attributes remained the same as they were in 2002 is given by:

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

Further, the counterfactual wealth distribution in 2010 if the distribution of attributions were given by a hypothetical distribution such as an extreme case where all bequests were 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. The construction of counterfactual distributions is of value for considering scenarios that were not observed, and for decomposing observed distributional changes into impacts arising from a range of different sources. For example, it is interesting to understand how the distribution of bequests has changed through time, and across generations, and how this is related to changes in the distributions of wealth or housing equity.

To perform the detailed decompositions, it is necessary to estimate the counterfactual distributions. DiNardo, Fortin and Lemieux (1996) (DFL) provide a method for obtaining the counterfactual distributions by reweighting the wealth distribution of the comparison group. 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. 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 easily estimated using a probit model and pooling the observed data for the two years involved in the comparison.

This framework provides a very general method for distributional comparisons, and has been widely applied in the economics literature to a range of outcomes including:

- Assessing factors related to differences in the distribution of wages such as gender, unionisation and minimum wages.
- Examining the sources of distributional differences in wealth such as race, ethnicity, educational attainment and behavioural attributes.

For our purposes, the empirical analysis will consider changes in the distribution of wealth over time, and how this relates to key attributes such as including tenure choice, location and the role of bequests. To illustrate, if the only attribute considered was bequests $(x = b)$ then the change in the distribution of wealth between 2002 and 2010 can be expressed as:

$$f^{2010}(W) - f^{2002}(W) = \left[f^{2010}(W) - \tilde{f}^{2010}(W)\right] - \left[f^{2002}(W) - \tilde{f}^{2010}(W)\right]$$

where the first component captures the impact of changes in the distribution of bequests through time holding the wealth determination process constant, and the second captures the changes in the wealth determination process with the distribution of bequests held constant.

There are a number of advantages in applying the DFL methods including:

- Entire distributions are compared (rather than simply focusing on summary statistics, e.g. the mean or median).
- The methods are multivariate and allow for the incorporate of a vector of characteristics x, which allow for a rich set of hypothetical comparisons.
- The methods are statistically robust and minimise the use of arbitrary assumptions on the shape of the distributions of interest.
- The methods are straightforward to implement with standard statistical software packages and can be shown graphically.

The methods for distributional comparisons readily extend to transformations of the distribution function $f^{t}(W)$. For example, in the inequality measurement literature a widely used tool is the Lorenz curve which illustrates key normative properties of the distribution. It has been shown that the Lorenz curve is a transformation of the distribution function (Lambert 1993) and the DFL decomposition can be applied directly to the empirical Lorenz curve (Cameron 2000) or the distribution function. In addition, summary measures of inequality based on the distribution function and Lorenz curve, such as the Gini coefficient, can be decomposed in the same way.

4.3 Identifying the relationships of interest—methodological challenges

In regression modelling and other statistical analysis, the identification of the relationships of interest can sometimes be challenging because of the nature of relationships being studied and the availability of data. Ideally, a randomised experiment in which households or individuals were randomly allocated into treatment groups (which received a transfer) and control groups (which did not receive a transfer) would be undertaken. A comparison of outcomes and behaviours could then be used to assess the impact of transfers on the variables of interest. In general, however, such data are unavailable in the social sciences.

A number of strategies are used to overcome the limitations associated with identifying the relationships of interest. In the regression analysis and the duration models the HILDA data provides a rich set of covariates that can be included in the models. In addition, the Propensity Score approach deals with the potential bias associated with the non-random distribution of parental transfers by selecting a counterfactual sample that is a replica of the treatment group in terms of its pre-treatment observable individual and demographic characteristics. Thus, it corrects for any systematic differences that may render some individuals more predisposed to receiving a parental transfer than others by retaining only those non-recipients with a strong likelihood of receiving a transfer. We refer to this sample of non-recipients as the 'counterfactual group'.

In the previous section we outlined a number of potentially confounding factors that may influence the likelihood of receiving a parental transfer. Matching the treatment and control group on each and every confounding variables separately is deemed unnecessary by the propensity score which simultaneously matches the two groups conditional on multiple pre-treatment characteristics using a single measure or index, referred to as the propensity score. Developed by Rosenbaum and Rubin (1983) the estimated propensity score is defined as the probability of an individual receiving a transfer conditional on their observable characteristics. The propensity score can be expressed as follows:

$$e_i = \Pr(T_i = 1 | X_i)$$

Where T_i denotes the probability of receiving a bequest for individual *i* and X_i denotes the baseline observable characteristics. The propensity score can be estimated using probit or logit models that regress a dichotomous dependent variable representing receipt of a transfer, on a series of independent variables comprising all observable characteristics that are thought to influence receipt of a transfer. That is, the number of siblings, parents' age, parents' occupation, etc. The propensity score can be thought of as the predicted probability of receiving a bequest. It can then be used to match the treatment group to a suitable control group conditional on its baseline characteristics.

The second stage of the analysis involves choosing an appropriate matching algorithm. There are a number of algorithms that can be used to match the treatment and control groups, but the most commonly used are the nearest neighbour matching method, radius matching, kernel matching and stratification matching.[7] We propose to use the nearest neighbour matching method which ties each transfer recipient to a non-recipient that is closest in terms of its estimated propensity score. We can express the nearest neighbour method algebraically as follows:

$$C(i) = \min_j \| p_i - p_j \|$$

[7] For a detailed description of the various matching methods, see Becker and Ichino (2002).

Where $C(i)$ denotes the individual in the counterfactual sample C that is matched to transfer recipient i with propensity score, p_i. It should be noted that the success of the pairing hinges on the important assumption of ignorable treatments, otherwise known as the 'no unmeasured confounders' assumption (Austin 2011) It postulates that all variables affecting treatment assignment are accounted for in the probit model. Failure to control for all confounding variables will lead to imprecise estimates of the propensity score. We will test the quality of matches using post-estimation t-tests which assess whether there remain any statistically significant differences in the covariates of paired treatment and counterfactual individuals. For example, is there any statistically significant difference in the mean age of individuals belonging to these two groups?

There are numerous ways in which the propensity score technique can be used to estimate treatment effects.[8] For instance, one can simply estimate the average effect of a treatment on the treated population by calculating the difference between the mean outcomes of the matched treatment and counterfactual persons. We propose to combine the propensity score matching method with regression analysis to improve the precision of our estimates (Dehejia & Wahba 2002). We also propose to experiment with alternative matching algorithms to test the sensitivity of findings to different matching specifications.

[8] See Austin (2011) for an outline of the various methodological techniques that utilise the propensity score.

5 DESCRIPTIVE STATISTICS AND PRELIMINARY ANALYSIS

This chapter reports on the results from a preliminary analysis of the HILDA data. The Final Report will consist of a number of related but nonetheless independent analyses of the data addressing the research questions listed in Chapter 2. In this section, we report some summary statistics from the HILDA data, along with preliminary results from the transition analysis and tenure choice models. In addition, we describe the savings behaviour of individuals who have and have not received an *inter vivos* gift or a bequest. In Chapter 6 we describe the next steps that are planned as part of a research strategy designed to address the project's key research questions.

5.1 Descriptive statistics

Critical for analysis of the role of transfers on housing and related outcomes is data on the receipt of such transfers. The HILDA dataset contains information on both *inter vivos* gifts received and bequests. In particular, as noted in Chapter 4, respondents in HILDA are asked:

> … (D)uring the last financial year did you receive payments from any of these sources? Include both lump sums and more regular payments, but do not include any payments we have already recorded elsewhere.

The options available include 'bequest/inheritances' or transfers from 'Parents'. Counts on the number of individuals who report receiving bequests or gifts and the value of those gifts or bequests are reported in Table 1, along with the mean value of transfers. The number of individuals who report receiving a parental transfer is around four times greater than the proportion who report receiving a bequest. Note that the bequest will not necessarily have been received by parents as the question does not specifically impose that restriction. As expected, the average value of parental transfers received in the previous year is significantly lower than the average value of bequests ($8565 and $79 280 respectively). Note that the value of transfers is highly skewed, with the median value of bequests significantly lower than the mean value. In the case of parental transfers, the median value of the transfers (not reported in Table 1) is $1000 per annum reflecting the predominance of small transfers from parents to their children on an annual basis. Critically, there are a significant number of respondents who report receiving transfers (gifts and or bequests) in the HILDA data, along with significant variation in the magnitude of such transfers. This provides the opportunity to undertake robust statistical analysis of the relationships of interest.

In Table 2 below some summary statistics for the individuals who do and do not report the receipt of a transfer (*inter vivos* and bequests) are reported. The sample used is individuals aged 25–65 years in wave 10 of the HILDA data and is the same as that used in the probit analysis reported in Section 5.2. As expected, the age of those who receive bequests is somewhat older (48.1 years) compared to non-bequest recipients (44.0 years) as bequests, especially those from parents, tend to be received as ageing parents pass away. In comparison, recipients of transfers are significantly younger (37.0 years) than those who do not receive gifts/transfers (45.8). It is likely that many of the other variables reported in Table 2 reflect life-cycle considerations. Those individuals who do receive bequests are more likely to be married and have dependent children. In terms of housing variables, as expected given their age profile, those who receive bequests are substantially more likely to report being in home ownership (79.8%) compared to other groups.

Table 1: Receipt of parental transfer or an inheritance/bequest

	Inheritance/bequest				Parental transfer		
Wave	**Median ($)**	**Mean($)**	**Obs.**	**%**	**Mean($)**	**Obs.**	**%**
2002	20,500	62,866	182	1.4%	3,970	582	4.6%
2003	20,000	66,548	191	1.5%	4,608	666	5.5%
2004	22,500	59,831	176	1.5%	3,472	701	5.8%
2005	22,500	74,655	172	1.4%	3,165	760	6.1%
2006	20,000	115,834	167	1.3%	3,292	707	5.8%
2007	25,000	65,723	173	1.4%	4,651	676	5.5%
2008	30,000	86,904	157	1.2%	4,360	753	6.1%
2009	19,000	65,262	176	1.4%	3,567	703	5.5%
2010	27,000	77,451	191	1.5%	4,457	858	6.6%
2011	35,000	83,743	215	1.3%	7,018	1,078	6.5%
2012	25,000	104,043	264	1.5%	5,819	1,081	6.5%
Total	*24,750*	*79,280*	*2,064*	*1.4%*	*4,572*	*8,565*	*5.9%*

Note: Sample is based on a pooled, unbalanced longitudinal sample drawn from the Responding Persons HILDA files comprising a total of 147 822 person-year observations.

* Counts include only those persons who provided an answer to questions regarding the amount of bequest or parental transfer received.

Household disposable income is relatively high for all groups in Table 2 below, reflecting the advanced stage of the life-cycle that the average household has reached. Education levels are reasonably evenly distributed with 33 per cent reporting at least a University Bachelor degree, and a substantial proportion (around 22%) having less than high school education (year 11). 'Gift recipients' have the lowest proportion with less than high school education, a pattern that most likely reflects a cohort effect. This group is the youngest on average among all those reported in Table 2, and will have higher levels of education due to increasing educational attainment over time for successively younger cohorts. In terms of transfers, an examination of Table 2 indicates that recipients receive substantial sums. In the case of bequests, the average value is approximately $85 000, while for *inter vivos* recipients, the amount received is somewhat lower, though still significant (approximately $14 000). Tables 1 and 2 also indicate that recipients tend to receive multiple transfers over this study time frame. Although the level of gifts in any given wave in HILDA is low (Table 1), the aggregate level of gifts over the initial 10 waves of HILDA is substantially higher.

Table 2: Characteristics of transfer recipients and non-recipients

	Bequests		Gifts	
	Recipients	**Non recipients**	**Recipients**	**Non recipients**
Tenure				
Owner (with or w/out mort.)	0.804	0.693	0.618	0.718
Renter	0.196	0.307	0.382	0.282
Personal characteristics				
Male	0.435	0.481	0.429	0.483
Age	48	44	37	45
Number of children	0.702	0.894	0.835	0.880
Number of siblings	2.599	2.832	2.212	2.898
Born in an Eng.-speak. country	0.119	0.090	0.086	0.094
Born non Eng.-speak. country	0.833	0.134	0.095	0.130
Born in Australia	0.756	0.776	0.820	0.776
Married/partnered	0.435	0.737	0.691	0.746
Household structure				
Couple, no children	0.346	0.282	0.275	0.291
Couple with dep.nts/children	0.362	0.402	0.401	0.398
Couple with non-dep. child	0.051	0.069	0.056	0.069
Lone p/rent & non-dep. child	0.033	0.030	0.018	0.033
Lone parent & dependents	0.036	0.060	0.047	0.059
Lone person	0.158	0.129	0.173	0.126
Other household type	0.013	0.026	0.031	0.024
Socio-economic characteristics				
Household disp. income	94594	91080	92230	91326
Employed full-time	0.520	0.560	0.581	0.552
Employed part-time	0.246	0.206	0.244	0.205
Not in labour force	0.209	0.201	0.141	0.211
Education				
Postgraduate	0.062	0.050	0.064	0.049
Graduate certificate/diploma	0.078	0.068	0.086	0.067
Bachelor	0.180	0.163	0.285	0.147
Diploma	0.116	0.099	0.107	0.100
Certificate	0.217	0.242	0.171	0.250
Year 12	0.119	0.124	0.153	0.119
Year 11	0.227	0.254	0.135	0.268
Location				
Victoria	0.251	0.248	0.310	0.239
Queensland	0.222	0.215	0.197	0.219
South Australia	0.096	0.090	0.085	0.092
Western Australia	0.076	0.092	0.075	0.093
Tasmania	0.029	0.030	0.027	0.031
Northern Territory	0.008	0.009	0.008	0.009
Australian Capital Territory	0.033	0.021	0.034	0.021
New South Wales	0.286	0.294	0.264	0.297
Agg. bequest/gift, W1–W10	84,557	NA	13765	NA
Observations	898	7,774	1,131	7,541

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

5.2 Tenure choice and transition models

5.2.1 Tenure choice models

A key issue of interest is the role that transfers play in influencing tenure choice. A series of tenure choice (probit) models have been estimated that relate tenure choice to the observable characteristics of individuals. The tenure choice models take the following form:

$$T_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + \varepsilon_i \qquad (1)$$

where T_i is a measure of tenure status equal to 1 if the individual is a home owner, or zero otherwise; X_i is a vector of socio-demographic and socio-economic variables that capture some of the key determinants of housing tenure, and Z_i is a measure of the receipt of a gift/bequest. In other models that are estimated, the vector Z_i captures the value of the gift/transfer or bequest that is received. A separate series of models are also estimated where the outcome is outright home ownership. Estimation is also undertaken separately for different age groups.

The probit analysis of tenure choice is undertaken using observed outcomes in wave 10 of the HILDA survey. The measure of gift or bequest receipt/value (Z_i) is the receipt (or total value) of gifts/bequests in the first 10 waves of HILDA. Alternative methods of identifying the impact of gifts/bequests on tenure outcomes are described in Chapter 6.

The results from the probit analysis are reported in Table 3 below. An extract of the complete set of results is presented, focusing on the impact of bequests and gifts from parents on home ownership outcomes. Complete regression results are listed in Appendix 2.

Four sets of results are set out in Table 3 for three alternative sample designs. In panel A, the dependent variable is home ownership (either outright ownership or with a mortgage) for the age group 25–65 years. Four separate models are presented, including a variable that captures either the receipt of a bequest; the value of bequests received; the receipt of a gift; and the value of gifts received. In panel B, the specifications are repeated using a sample of individuals aged 25–45. The focus on this group reflects the fact that by age 45, most home owners have made the transition into home ownership by this age, so the receipt of bequests or gifts may have more significant impacts in this age band. Panels C and D repeat the analysis, but use a dependent variable equal to 1 if the individual owns a home outright, 0 otherwise. For ease of interpretation, marginal effects from the probit analysis are reported.

Table 3: Tenure choice models

	Model 1	Model 2	Model 3	Model 4
A—Dependent variable (home ownership); age 25–65				
Received a bequest	0.0541* (0.0159)	-	-	-
Amt. of bequest ($0,000s)	-	0.0065*** (0.0016)	-	-
Received a gift	-	-	-0.0249 (0.0157)	-
Amount of gift ($0,000s)	-	-	-	0.0108** (0.0047)
Number obs.	8,672	8,672	8,672	8,672
B—Dependent variable (home ownership); age 25–45				
Received a bequest	0.0330 (0.0288)	-	-	-
Amt. of bequest ($0,000s)	-	0.0044* (0.0024)	-	-
Received a gift	-	-	-0.0349* (0.0209)	-
Amount of gift ($0,000s)	-	-	-	0.0095 (0.0058)
Number obs.	4,581	4,581	4,581	4,581
C—Dependent variable (outright home ownership); age 25–65				
Received a bequest	0.0563** (0.0158)	-	-	-
Amt. of bequest ($0,000's)	-	0.0022** (0.0007)	-	-
Received a gift	-	-	-0.0160 (0.0149)	-
Amount of gift ($0,000's)	-	-	-	0.0025 (0.0026)
Number obs.	8,672	8,672	8,672	8,672
D—Dependent variable (outright home ownership); age 25–45				
Received a bequest	0.0428** (0.0189)	-	-	-
Amt. of bequest ($0,000s)	-	0.0028*** (0.0001)	-	-
Received a gift	-	-	-0.0059 (0.0115)	-
Amount of gift ($0,000s)	-	-	-	0.0038* (0.0021)
Number obs.	4,581	4,581	4,581	4,581

Results from the probit analysis suggest that the receipt of bequests increases the likelihood that individuals attain home ownership, either with or without a mortgage (panels A and B), or outright home ownership (panels C and D). Our estimates suggest that receipt of a bequest over the previous 10-year period lifts the probability of being in home ownership by 2–4 percentage points, with an even larger impact on the likelihood of outright home ownership. The chances of being observed in home ownership in wave 10 are also positively related to the size of the bequest received. In panel A, a bequest of $10 000 increases the probability of being observed in home ownership by 0.4 percentage points. Recall that the mean value of bequests received is in the order of $85 000, suggesting that an average bequest increases the likelihood of being observed in home ownership by around 3.4 percentage points.

Model specifications that include the receipt of gifts or the value of gifts seem to be 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. This may be due to the low value of gifts that are not intended to facilitate beneficiaries' entry into home ownership. Nonetheless, there is some evidence that the value of gifts received over the previous 10 years is correlated with home ownership. A gift(s) of $10 000 increases the likelihood that younger individuals report being an outright home owner by around 0.3 percentage points (panel D). For an average gift of $14 000, this represents a higher probability of being in home ownership in the order of 0.42 percentage points. Similar albeit smaller impacts are identified for older individuals in panel A.

5.2.2 Transition models

As a first step in analysing transitions between different housing tenures we report the conditional probability that individuals change tenure around the time that bequests or inheritances are received. For this analysis, we exploit the panel nature of the HILDA data and compare the proportion of individuals in alternative tenures conditional on their tenure in the previous periods. We begin by considering the nature of transitions between period $(t-1)$ and $(t+1)$ for individuals who receive an inheritance or bequest in period t. Transition matrixes for bequest recipients and non-recipients are presented in Table 4 (panel A and panel B respectively).

We then consider the nature of transitions between period (t) and $(t+1)$ for individuals who receive an inheritance or bequest in period t. The transition matrixes for bequest recipients and non-recipients are presented in Table 5 below (panel A and panel B respectively).

The transitions reported in Table 4 reveal a number of patterns. Among those who do and do not receive a bequest, the transition between outright ownership across the periods is similar (81 and 82.7% respectively). Note that those who receive a bequest are more likely to be in outright ownership (41.2%) in period $(t+1)$, which is expected a *priori* given the higher age for that group. It is notable that a higher proportion of recipients who have a mortgage in period $(t-1)$ report being in outright ownership in $(t+1)$ compared to non-recipients (21.3 and 12.6% respectively). Similarly, among those individuals who report being in private rental accommodation in period $(t-1)$, recipients are more likely to transition into home ownership (either outright or with a mortgage) in period $(t+1)$. It is important to note, however, that the number of recipients who are in private rental accommodation in period $(t-1)$ is relatively small (n = 169).

The transitions reported in Table 5 exhibit similar patterns to those in Table 4. In short, there is some evidence that the receipt of a bequest facilitates tenure transitions into home ownership. Note that the transitions presented in Tables 4 and 5 do not control for any other determinant of tenure status other than the receipt of a bequest.

Table 4: Tenure transitions $(t-1)$, $(t+1)$

Panel A—recipients		**Period $(t+1)$ tenure status**				
		Own outright	**Own with mortgage**	**Private renter**	**Other rental**	**Row count**
Period $(t-1)$ tenure status	Own outright (%)	81.0	14.8	2.4	1.9	373
	Own with mortgage (%)	21.3	74.0	3.4	1.2	408
	Private renter (%)	7.7	23.7	63.3	5.3	169
	Other tenure (%)	16.3	18.6	7.0	58.1	43
	Total (%)	41.2	40.8	13.4	4.6	993
Panel B—non recipients		**Period $(t+1)$ tenure status**				
		Own outright	**Own with mortgage**	**Private renter**	**Other rental**	**Row count**
Period $(t-1)$ tenure status	Own outright (%)	82.7	11.7	3.8	1.9	3,059
	Own with mortgage (%)	12.6	79.4	6.9	1.2	3,651
	Private renter (%)	3.8	15.8	74.9	5.6	1,891
	Other tenure (%)	7.7	9.3	21.9	61.0	816
	Total (%)	33.2	38.6	20.8	7.5	9,417

Table 5: Tenure transitions (t), $(t+1)$

Panel A—recipients		**Period $(t+1)$ tenure status**				
		Own outright	**Own with mortgage**	**Private renter**	**Other rental**	**Row count**
Period (t) tenure status	Own outright (%)	87.2	11.1	0.9	0.9	576
	Own with mortgage (%)	13.3	83.1	2.3	1.2	563
	Private renter (%)	3.9	10.9	79.6	5.7	230
	Other tenure (%)	13.2	10.5	7.9	68.4	76
	Total (%)	41.3	39.1	14.3	5.3	1,445
Panel B—non recipients		***Period $(t+1)$ tenure status***				
		Own outright	**Own with mortgage**	**Private renter**	**Other rental**	**Row count**
Period (t) tenure status	Own outright (%)	85.0	11.5	2.3	1.1	3,256
	Own with mortgage (%)	10.9	84.4	4.0	0.8	3,983
	Private renter (%)	2.1	10.1	83.3	4.5	2,144
	Other tenure (%)	6.0	5.9	22.3	65.9	937
	Total (%)	32.0	38.8	21.6	7.6	10,320

5.2.3 Savings behaviour

The final set of preliminary results to be presented focus on the saving behaviours of transfer recipients and non-recipients. Recall that one channel through which agents may respond to a transfer is by altering their own saving. Engelhardt and Mayer (1998), for example, find that recipients of transfers reduce their own savings by approximately $0.35 for every dollar in transfers received. The HILDA dataset contains some, albeit limited data, on the savings behaviour of individuals which allows some descriptive analysis of the impact of transfers on saving behaviour.

In Table 6 below we identify the proportion of transfer recipients (*inter vivos* gifts and bequest) that report having a 'regular savings plan'. To make the analysis more focused, the sample is restricted to individuals aged 25–45 years who are currently renting. Arguably, for this group the desire to save for home ownership would be a strong motivating factor behind a regular savings plan. Moreover, we identify transfer recipients in wave t $(t = 2004, 2008 \; or \; 2012)$ as those individuals who report receiving a transfer (gift or bequest) in waves $(t-3),(t-2),(t-1) \; or \; t$. Hence, in the wave 4 data (collected in 2004) we identify individuals who report receiving a transfer in either waves 1, 2 ,3 or 4. We compare the probability that those individuals report saving 'regularly' to non-recipients who report no receipt of a transfer between waves 1, 2, 3 or 4.

The descriptive statistics in Table 6 suggest that those who report receiving gifts are *less likely* to save regularly. For example, in wave 4, 18 per cent of gift recipients report saving regularly compared to 23 per cent of non-recipients. Although this pattern is similar to that reported in wave 12, it is noticeable that in wave 8 no such pattern is apparent. It is not the case, however, that bequest recipients are less likely to exhibit regular savings compared to those who do not report the receipt of a bequest.

Table 6: Savings behaviour, transfer recipients and non-recipients

Sample	Count and %	Wave		
		4	**8**	**12**
Bequest recipients	Recipient of a bequest in previous 4 waves	46	59	93
	Save regularly	0.31	0.31	0.26
Bequest non-recipient	Non recipient of a bequest in previous 4 waves	2,316	2,628	3,559
	Save regularly	0.23	0.23	0.29
Gift recipients	Recipient of a gift in previous 4 waves	123	195	271
	Save regularly	0.18	0.24	0.20
Gift non-recipient	Non recipient of a gift in previous 4 waves	2,239	2,942	3,381
	Save regularly	0.23	0.23	0.29

It is important to provide some additional explanation of the relationships described in Table 6. First, it is important to emphasise that it is not being suggested that the patterns reported capture underlying causal relationships. The analysis is descriptive and demonstrates one potential mechanism by which transfers might influence behaviour, namely a 'crowding out' of savings. A thorough analysis will require additional analysis of the data reported in Table 6 using

other information available in HILDA such as the age of individuals, along with other information around savings behaviour in HILDA. Some of the proposed analysis is described in Section 6.2.

The second key issues is that it is perhaps not unexpected that the summary statistics reveal no relationship between the receipt of a bequest and savings behaviour in period t . Recall that the bequest will have been received in earlier periods. In general, it might be argued that bequests are anticipated even though the exact timing is uncertain. Nonetheless, many individuals might reasonably expect to receive a bequest of uncertain value in the future. In this context, it may be more likely that savings behaviour will be influenced by the *expectation* of a future bequest. To the extent that expectation of a future bequest can be identified in HILDA, a useful analysis would be to consider the nature of current savings behaviour. Information on age, the health of parents and the number of siblings an individual has may, for example, provide some insight into whether individuals expect a bequest in the near future. This question will be explored in analysis reported in the Final Report.

6 POLICY CONTEXT AND NEXT STEPS

6.1 Policy context

Analyses of the role of transfers on housing and related outcomes, and their impact on inequality, reflects the strong policy relevance of the research questions addressed in this report. That policy relevance mirrors a number of important considerations including the strong social norms associated with home ownership in Australia. Historically, home ownership has represented an important vehicle for saving and the accumulation of wealth. In turn, the tax and transfer system has evolved over time in a way that reflects the central role played by tenure choice in the financial and consumption decisions of Australians.

A number of recent developments in the housing market potentially have important implications across a range of policy fronts. First, there has been a marked decline in the proportion of first home buyers in the housing market. While successive federal and state governments have used various transfers (e.g. First Home Owner Grants) to assist first home buyers, they have not prevented this decline, and one possible explanation is that private transfers (e.g. bequests and gifts) and public transfers are substitutes. Second, and coupled with this, there is evidence that some individuals are increasingly reliant on familial support or other transfers to attain home ownership. There is a sense in some political circles that baby boomer parents are recycling housing wealth to aid their children's ascent into home ownership, but these intergenerational transfers are helping to widen the gap between 'haves' and 'have nots'. Both developments motivate the analysis in this project and, as we demonstrate in this chapter, have important policy implications.

6.1.1 Tax policy—the design of appropriate taxes

One obvious mechanism by which the analysis in this report can inform policy is in the context of tax and transfer policy. The recent review of the Australian Taxation system conducted by Dr. Ken Henry (the 'Henry Report') identified a range of proposals to improve the efficiency and equity of taxes (Department of Treasury 2010). While no recommendation was made on the introduction of a tax on bequests, such an approach has advantages from both an equity and efficiency perspective. 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. Arguably, a bequest or inheritance tax may need to be coupled with a gift tax such as that analysed in Yukutake et al. (2011). The analysis in that paper highlighted *inter vivos* transfers as simply one component of a strategic relationship between parents and their children. It is important to acknowledge that were bequest or inheritance taxes to be considered, the unintended consequences of such policies beyond the mere raising of revenue should be thought through.

For the purpose of this report, the empirical analysis will inform how the tax system can be designed in a way that facilitates and is consistent with policies designed to encourage home ownership.

6.1.2 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. In general, the family home is excluded from the asset and income means tests that determine eligibility for benefits as well as entitlements for those deemed eligible. Understanding how intergenerational transfers impact on inequality is central to the design of a tax and transfer system that achieves the desired outcomes. The analysis in this report will form part of the evidence base that can be used to inform the appropriate design of tax and transfer policy, and their redistributive implications.

6.1.3 Targeted transfer policies

Successive Australian governments have encouraged home ownership through a range of mechanisms including first home owners grants and stamp duty concessions. In putting these policies in place it is not clear what, if any, attention has been given to the role of private transfers in complementing or substituting for these public transfers. It could be argued, for example, that an increase in public transfers, such as the first home owners grant, may be offset entirely by a reduction of private transfers. If this is the case, then the public transfers may in fact be largely ineffective in encouraging home ownership. If the relationship is complementary, and private familial transfers only occur in some households such as the relatively wealthy, a better transfer policy could be one that is more targeted.

The analysis in this report will shed some light on this question though it is important to emphasise that no specific policy will be analysed. Rather, understanding the nature of private intergenerational transfers and their impact on behaviours (e.g. saving) and outcomes (e.g. tenure choice), will provide a solid evidence basis on which effective policies can be developed.

6.1.4 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 welfare 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.

These ideas have been taken in two new directions. First, Lowe (2011) and Smith and Searle (2008) highlight the emergence of flexible mortgage products that have transformed owner occupied housing from what was once an illiquid asset, into a store of value that can be readily tapped in order to meet pressing spending needs There is therefore a new welfare role emerging around housing wealth, one that allows home owners to smooth consumption and buffer income shocks at all stages of the life cycle. It turns out that couples with children are particularly prone to release housing equity by adding to their mortgages (Wood et al. 2013). This kind of finding hints at an intergenerational dimension to housing equity withdrawal, one that an Australian Federal Government might be tempted to encourage as it could help relax fiscal constraints that are expected to tighten in the medium term.

Willetts (2010) has a somewhat different take on the intergenerational public and private transfer issue. He argues that the baby boomer generation has stolen their children's future by dominating wealth holdings that underpin a dominant position in society. This concentration of wealth has emerged by happenstance—rising real house prices, free access to higher education and health—being in the 'right place at the right time'. The baby boomer generation are a big and lucky one that has more than their fair share of the nation's wealth. This generational imbalance should be addressed by persuading baby boomers to hand back some of these resources. Recycling housing wealth is one of if not the most important vehicle through which such redistribution can be executed. But even if we accept that a generational imbalance exists, can we expect baby boomers to gift some of their resources? Might government intervention be required to compel such a redistribution?

The analysis undertaken for this report will contribute to the knowledge base associated with the development of policies around the tax and transfer system. Importantly, the analysis will also inform those policies designed to facilitate home ownership. The discussion of the existing literature in Chapter 3 highlights the relationship between housing outcomes, wealth and intergenerational transfers. By identifying how transfers impact on the housing careers of individuals, the analysis will provide guidance about how effective policies to promote home ownership can be designed. In particular, it is likely that insight will be provided on how policies

such as those related to tax and transfers are consistent with those designed to promote home ownership.

6.2 Empirical analysis—the next steps

This Positioning Paper has provided a review of the existing literature along with a discussion of the methodologies to be applied to address the research questions set out in Chapter 1. The Final Report will build on the preliminary analysis described in Chapter 5 in a number of ways.

6.2.1 Descriptive analysis

The analysis to date has not fully utilised the panel aspect of the HILDA data. Indeed, this aspect of the HILDA data is one of its key strengths in analysing housing-related decisions as they are intricately related to life-cycle considerations. Moreover, the richness of the HILDA data provides a number of opportunities to document the nature and extent of intergenerational transfers in Australia, and their impact on economic behaviours and outcomes.

Further descriptive analysis of the nature of intergenerational transfers will be presented that consider how parents provide in-kind support to their children in two important ways. First, building on existing analysis (Flatau et al. 2007), tabulations of the extent that independent children remain in the parental home will be set out. In addition, among individuals who experience significant life-events such as a separation, there is some evidence that many individuals return to the parental home (Wood et al. 2013). These moves represent a potentially important transfer to recipients because they provide a means to replenish savings and regain home ownership.

In addition, HILDA provides an opportunity to examine the savings behaviour of individuals. While preliminary descriptive statistics are presented in Chapter 5, the Final Report will contain additional statistics relating to the reasons for saving. These include savings variable *fishome* contained in the Self-Completed Survey (waves 2 and 6) SCQ that identifies why respondents are saving, with one reason being '*To buy a home (other than present one)*'. Similarly, wave 4 of HILDA contains a dedicated set of 'youth' questions that include whether the individual has begun '*saving for a deposit for a residential property yet*' (*variable name—ypdep*).

The data in HILDA around savings is somewhat limited in its scope and it is unlikely that these will provide sufficient information to model the impact of transfers on in a robust way. Nonetheless, descriptive cross tabulations will provide insight into the nature of how these vary across individuals who do and do not receive transfers.

6.2.2 Regression analysis

Some preliminary tenure choice models have been estimated and reported in Chapter 5. The Final Report will include additional regression estimates using additional waves of HILDA. Further, regression models that investigate the value of the deposit saved and the value of the homes purchased will be reported to the extent that such models are supported by the data in HILDA. These are important dimensions associated with the impact of transfers identified in the international literature (Engelhardt & Mayer 1998), for which little or no evidence exists for Australia.

6.2.3 Duration and transition analysis

The Final Report will extend the transition analysis presented in Chapter 5 in two ways. First, the transition matrices will be estimated by using a PSM methodology to identify the appropriate control set. At present, the non-recipients are simply selected by setting wave 6 (or year 2006) equal to t. Wave 6 was selected as the base year for the transition matrices because it is the mid-point in the study timeframe and so allows us to comfortably observe tenure transitions between periods t-1 and t+1 for all responding individuals. The analysis in the Final Report will

take a more rigorous approach to identifying a control group to facilitate a comparison between outcomes for those who do and do not receive transfers.

The second generalisation will involve the estimation of a series of duration models similar to those reported in Guiso and Japelli (2002). These models will consider a set of renters who are 'at risk' of transitioning into home ownership. The analysis will identify how the hazard or conditional probability that such a transition occurs controlling for a range of factors that are likely to influence such an outcome, including the receipt of a transfer in the form of a bequest or intergenerational gift.

Data preparation is ongoing and will be undertaken when release 13 of HILDA becomes available.

6.2.4 Wealth distribution analysis

Data preparation is ongoing and the analysis will use the wealth modules in HILDA release waves 2, 6 and 10. The methodology is well developed in the literature and statistical syntax required to undertake the analysis is readily available.

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APPENDIXES

Appendix 1: Summary of international and Australian literature on transfers, home ownership and savings behavior

Measures	Reference	Country/region	Data source	Type of transfer analysed	Results
Amount of transfer/likelihood of transfer	O'Dwyer, L A 2001, 'The impact of housing inheritance on the distribution of wealth in Australia', *Australian Journal of Political Science*, vol.36, no.1, pp.83–100.	Australia	Data on deceased estates in South Australia	Bequests	Around 1 per cent of all households receive bequests on an annual basis. Also, older households hold lower levels of housing assets than younger cohorts, reflecting a cohort effect
	King, A & McDonald, P 1999, 'Private transfers across generations', NATSEM Discussion paper no.41, University of Canberra, March.	Australia	Bureau of Statistics Survey of Families 1992	Bequests and gift/loans for property purchase	Approximately 5.5 per cent of respondents report receiving help with land or home purchase in the previous 10 years-peaking for persons aged 30–35, while only 3 per cent reported receiving an inheritance over the same timeframe; age of recipients of this type of transfer peaked at 50–60 years.
	King, A & McDonald, P 1999, 'Private transfers across generations', NATSEM Discussion paper, no.41, University of Canberra, March.	Australia	Bureau of Statistics Survey of Families 1992	Bequests and gift/loans for property purchase	Approximately 5.5 per cent of respondents report receiving help with land or home purchase in the previous 10 years—peaking for persons aged 30–35—while only 3 per cent reported receiving an inheritance over the same timeframe; age of recipients of this type of transfer peaked at 50–60 years.
	Schoeni, R F 1997, 'Private interhousehold transfers of money and time: new empirical evidence', *Review of Income and Wealth*, vol.43, no.4, pp.84–112.	United States	Panel Study of Income Dynamics (PSID)	Inter vivos and bequests	Positive and significant association between parental wealth and the probability of receiving a parental transfer *and* the amount of transfer received; amount received is $1500 greater for children whose parents' net wealth is between $100 000–$250 000 than that received by the children of parents whose net wealth is $25 000–$150 000. Negative relationship between household income and likelihood of receipt and amount received.
	Berry, B 2008, 'Financial transfers from living parents to adult children—Who is helped and why?', *American Journal of Sociology and Economics*,	United States	American Health and Retirement Survey	Inter-vivos	Disadvantaged children more likely to receive inter-vivos parental transfers than their well-off and home-owning peers. Children earning $25 000 or more per annum are 39 per cent less likely to receive a transfer as compared to those earning less than $25 000. Parents are 35 per cent less likely to

Measures	Reference	Country/region	Data source	Type of transfer analysed	Results
	vol.67, no.2, pp.207–39.				provide financial assistance to children who own their own home.
	Zissimopoulos, J & Smith, J P 2011, 'Unequal giving: monetary gifts to children across countries and over time' in *Persistence, privilege, and parenting: the comparative study of intergenerational mobility*, Russell Sage Foundation; pp.289–328.	United States and Europe	Survey of Health and Ageing and Retirement in Europe; Health and Retirement Study (US)	Inter-vivos	Average amount of inter-vivos gifted from parents to children in the US was over $37 000 over 16 years to all of their children. Average annual amount transferred to children in Europe was around €1000 or €420 per child; this is 50 per cent less than the amount transferred in the US. Authors also find significant variation in the amount of transfer behaviour across European countries due to differences in institutional and policy settings.
Role of transfers in facilitating home ownership	Duffy, D & Roche, M J 2007, *Getting a helping hand: parental transfers and first-time homebuyers*, Economics, Finance and Accounting Department Working Paper series , National University of Ireland, Maynooth.	Republic of Ireland	Survey data on random sample of first home buyers in Ireland	Inter vivos	Around one-third of households receive an *inter vivos* transfer and the transfer represented 21 per cent of the down payment.
	Engelhardt, G V & Mayer, C J 1998, 'Intergenerational transfers, borrowing constraints and saving behavior: evidence from the housing market', *Journal of Urban Economics*, vol.44, pp.135–57.	United States	Survey data on random sample of recent first-time and repeat home buyers	Inter vivos	Around 22 per cent receive transfers targeted towards the purchase of a home; the average transfer represented around 50 per cent of the down payment required.
	Guiso, L & Japelli, T 2002, 'Private transfers, borrowing constraints and the timing of homeownership', *Journal of Money Credit and Banking*, vol.34, no.2, pp.315–39.	Italy	1991 Bank of Italy Survey of Household Income and Wealth (SHIW)	Inter-vivos and bequests	Around 16 per cent of individuals in Italy report receiving a gift or financial support intended for real estate purchase.

Measures	Reference	Country/region	Data source	Type of transfer analysed	Results
	Boehm, T P & Schlottmann, A M 2001, 'Housing and wealth accumulation: intergenerational impacts', LIHO-01.15, Low-Income Homeownership Working Paper Series, Joint Center for Housing Studies, Harvard University.	United States	PSID	Inter-vivos	Children of home owners are more likely to enter into home ownership and the higher educated tend to achieve greater levels of housing and non-housing wealth. Low-income households accumulate less wealth for every dollar in gifts received compared to higher income households.
	Luea. H M 2008	United States	PSID	Inter vivos, transfers and similar payments	Transfer recipients are 1.2 times more likely to purchase a home compared to non-recipients. The impact is larger for those who receive transfers greater than $5000.
	Withers, S & Reid, C 2005	United States	PSID	Gifts and financial help received from persons outside of family unit	For households that receive a financial gift, the value of the occupied home increases by approximately $19 000. As a result, financial help or gifts lead to a higher housing cost burden, which suggests that transfers are not used to increase the down payment or reduce the size of repayments, but rather feed directly into higher housing consumption.
	Spilerman, S & Wolff, F C 2012, 'Parental wealth and resource transfers: How they matter in France for homeownership and living standards', *Social Science Research*, vol.41, pp.207–23.	France	The Actifs Financiers Survey (Survey of Financial Assets)	Inter vivos and bequests	Parental transfers impact on the likelihood that individuals are home owners and the amount of housing consumed. Increase in the value of housing consumption is partly explained by the increase in the value of the down-payment, and partly because of an impact through higher purchase prices.
	Kolodziejczyk, C & Leth-Petersen, S 2013, 'Do first time house buyers receive financial transfers from their parents?', *Scandinavian Journal of Economics*, vol.115, no.4, pp.1020–45.	Denmark	Danish administrative data on individuals	Inter vivos	Little evidence that intergenerational transfers are used to support home ownership and no evidence that parents transfer resources to children to facilitate home ownership, or insure against labour market shocks around the time home ownership is entered into.
	Mulder, C H & Smits, A 2013, 'Inter-generational ties, financial transfers and home-ownership support', *Journal of Housing and the Built Environment*, vol.28, pp.95–112.	The Netherlands	Netherlands Kinship Panel Study	financial assistance towards buying a home, and financial assistance in the form of gifts of € 5000 or more	Around 9 per cent of survey individuals received financial support from parents for home ownership. Parental support to facilitate home ownership was positively correlated with parental resources and more likely among individuals who reported that their parents were home owners.

Measures	Reference	Country/region	Data source	Type of transfer analysed	Results
	Helderman, A & Mulder, C 2007, 'Intergenerational transmission of homeownership: the roles of gifts and continuities in housing market characteristics', *Urban Studies*, vol.44, no.2, pp.231–47.	The Netherlands	Netherlands Kinship Panel Study	Financial assistance towards buying a home, and financial assistance in the form of gifts of € 5000 or more	Gift-giving forms an important component of intergenerational transmission of home ownership; also, there is evidence to suggest that individuals' housing tenure is determined by their parents' tenure status.
	Yukutake, N, Iwata, S & Idee, T 2011, *Strategic interaction between inter vivos gifts and housing acquisition*, Working paper no.264, Faculty of Economics, University of Toyama.	Japan	Data on households who purchased a detached house in an urban area	Parental inter-vivos	No relationship found between inter-vivos transfers and the price of housing
Role of transfers in savings behaviour	Engelhardt, G V & Mayer, C J 1998, 'Intergenerational transfers, borrowing constraints and saving behavior: evidence from the housing market', *Journal of Urban Economics*, vol.44, pp.135–57.	United States	Survey data on random sample of recent first-time and repeat home buyers	Inter vivos	Recipients of transfers save around $0.35 less for every dollar in transfers received and spend less time saving for down payments or deposits and Down payment is higher among transfer recipients, and the value of the house purchased is higher, though the entire amount of the transfer is not capitalised into the value of the home purchased.

Appendix 2: Tenure choice models, full results

Tables presented below list the full set of marginal effects estimates for models 1–4. Models 1 and 3 capture the effect of receiving a bequest or gift between waves 1–10 on housing tenure, respectively; models 2 and 4 on the other hand control for the impact of the value of bequests or gifts received between waves 1–10 on tenure choice. The models are implemented on the following four samples:

1. Individuals aged between 25–65 and who are home owners (outright owners or mortgagors) versus renters in wave 10.
2. Individuals aged between 25–45 and who are home owners (outright owners or mortgagors) versus renters in wave 10.
3. Individuals aged between 25–65 and who are outright home owners versus mortgagors and renters in wave 10.
4. Individuals aged between 25–45 and who are outright home owners versus mortgagors and renters in wave 10.

Table A1: Sample 1—Marginal effects estimates on individuals aged between 25–65 and all home owners vs. renters

Variable name	(1)	(2)	(3)	(4)
	Model 1	**Model 2**	**Model 3**	**Model 4**
Male	-0.0449***	-0.0453***	-0.0459***	-0.0450***
	(0.0112)	(0.0111)	(0.0112)	(0.0112)
Age	0.0126***	0.0126***	0.0126***	0.0129***
	(0.000545)	(0.000544)	(0.000555)	(0.000544)
Number of children	0.00147	0.000827	0.000551	0.000827
	(0.00774)	(0.00772)	(0.00775)	(0.00774)
Number of siblings	-0.0173***	-0.0169***	-0.0178***	-0.0174***
	(0.00242)	(0.00241)	(0.00242)	(0.00242)
Born in main English-speaking country	-0.0658***	-0.0648***	-0.0650***	-0.0658***
	(0.0195)	(0.0194)	(0.0195)	(0.0195)
Born in main non-English-speaking country	-0.0409**	-0.0416**	-0.0458***	-0.0451***
	(0.0167)	(0.0167)	(0.0168)	(0.0168)
Married	-0.0166	-0.0168	-0.0170	-0.0171
	(0.0321)	(0.0320)	(0.0320)	(0.0321)
De facto	-0.226***	-0.227***	-0.227***	-0.226***
	(0.0392)	(0.0392)	(0.0391)	(0.0391)
Separated	-0.0768**	-0.0759**	-0.0794**	-0.0792**
	(0.0321)	(0.0320)	(0.0322)	(0.0322)
Widowed	0.0744**	0.0767**	0.0785**	0.0785**
	(0.0343)	(0.0338)	(0.0338)	(0.0337)
Divorced	-0.0683***	-0.0685***	-0.0696***	-0.0703***
	(0.0244)	(0.0244)	(0.0245)	(0.0245)
Couple, no children	0.214***	0.214***	0.213***	0.214***

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
	(0.0257)	(0.0256)	(0.0258)	(0.0257)
Couple with dependents/children	0.253***	0.255***	0.253***	0.254***
	(0.0312)	(0.0311)	(0.0312)	(0.0312)
Couple with non-dependent children	0.199***	0.199***	0.197***	0.198***
	(0.0157)	(0.0155)	(0.0159)	(0.0158)
Lone parent with non-dependent children	0.106***	0.105***	0.105***	0.107***
	(0.0213)	(0.0212)	(0.0214)	(0.0212)
Lone parent with dependents/children	0.00182	0.00254	-0.000651	0.00264
	(0.0265)	(0.0264)	(0.0267)	(0.0265)
Other household type	-0.118***	-0.118***	-0.122***	-0.121***
	(0.0384)	(0.0384)	(0.0386)	(0.0385)
Household disposable income 0,000's	0.0168***	0.0167***	0.0168***	0.0168***
	(0.00135)	(0.00135)	(0.00135)	(0.00135)
Employed full-time	0.0963***	0.0970***	0.0958***	0.0966***
	(0.0141)	(0.0141)	(0.0141)	(0.0141)
Employed part-time	0.0779***	0.0785***	0.0792***	0.0785***
	(0.0156)	(0.0155)	(0.0156)	(0.0156)
Underemployed	-0.0719***	-0.0741***	-0.0734***	-0.0720***
	(0.0269)	(0.0270)	(0.0270)	(0.0269)
Postgraduate	0.0410*	0.0425*	0.0452*	0.0423*
	(0.0241)	(0.0240)	(0.0239)	(0.0241)
Graduate certificate/diploma	0.100***	0.0982***	0.103***	0.0991***
	(0.0185)	(0.0185)	(0.0183)	(0.0186)
Bachelor	0.0880***	0.0879***	0.0927***	0.0890***
	(0.0146)	(0.0145)	(0.0145)	(0.0145)
Diploma	0.0670***	0.0665***	0.0699***	0.0687***
	(0.0167)	(0.0166)	(0.0165)	(0.0166)
Certificate	0.0474***	0.0473***	0.0485***	0.0487***
	(0.0135)	(0.0134)	(0.0134)	(0.0134)
Year 12	0.0714***	0.0709***	0.0739***	0.0725***
	(0.0151)	(0.0151)	(0.0151)	(0.0151)
Victoria	0.0314**	0.0322**	0.0329**	0.0316**
	(0.0133)	(0.0132)	(0.0133)	(0.0133)
Queensland	0.00113	0.00255	0.00122	0.00106
	(0.0141)	(0.0140)	(0.0141)	(0.0141)

Variable name	(1)	(2)	(3)	(4)
	Model 1	**Model 2**	**Model 3**	**Model 4**
South Australia	0.0170	0.0192	0.0174	0.0170
	(0.0183)	(0.0182)	(0.0183)	(0.0183)
Western Australia	0.0202	0.0198	0.0188	0.0194
	(0.0185)	(0.0184)	(0.0185)	(0.0185)
Tasmania	0.0729***	0.0750***	0.0731***	0.0741***
	(0.0249)	(0.0246)	(0.0249)	(0.0248)
Northern Territory	-0.155**	-0.156**	-0.157**	-0.155**
	(0.0611)	(0.0612)	(0.0612)	(0.0611)
Australian Capital Territory	0.0444	0.0436	0.0479	0.0459
	(0.0341)	(0.0340)	(0.0337)	(0.0339)
Life satisfaction (1–10)	0.0121***	0.0120***	0.0122***	0.0124***
	(0.00341)	(0.00340)	(0.00341)	(0.00341)
Ever received a bequest	0.0541***			
	(0.0159)			
Total amount of bequest received across sample frame (ten ‘000s of dollars)		0.00652***		
		(0.00159)		
Ever received a gift			-0.0249	
			(0.0157)	
Total amount of gift received across sample frame (ten ‘000s of dollars)				0.0108**
				(0.00470)
Observations	8,672	8,672	8,672	8,672

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Omitted categories include Born in Australia, Single never married, Lone persons, Unemployed/Not in the labour force, Year 11 and NSW

Table A2: Sample 2—Marginal effects estimates on individuals aged between 25–45 and all home owners vs renters

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Male	-0.0514***	-0.0514***	-0.0517***	-0.0506***
	(0.0179)	(0.0179)	(0.0179)	(0.0179)
Age	0.0159***	0.0159***	0.0155***	0.0160***
	(0.00143)	(0.00143)	(0.00145)	(0.00143)
Number of children	-0.0107	-0.0110	-0.0111	-0.0110
	(0.0109)	(0.0109)	(0.0109)	(0.0109)
Number of siblings	-0.0179***	-0.0178***	-0.0183***	-0.0177***
	(0.00458)	(0.00458)	(0.00459)	(0.00458)
Born in main English-speaking country	-0.0903***	-0.0899***	-0.0887***	-0.0888***
	(0.0327)	(0.0327)	(0.0327)	(0.0327)
Born in main non-English-speaking country	-0.0419	-0.0421	-0.0456*	-0.0441*
	(0.0266)	(0.0265)	(0.0266)	(0.0265)
Married	-0.0179	-0.0170	-0.0175	-0.0180
	(0.0542)	(0.0542)	(0.0541)	(0.0542)
De facto	-0.267***	-0.266***	-0.267***	-0.267***
	(0.0556)	(0.0556)	(0.0556)	(0.0556)
Separated	-0.0467	-0.0462	-0.0482	-0.0481
	(0.0508)	(0.0509)	(0.0509)	(0.0509)
Widowed	0.214**	0.215**	0.216**	0.216**
	(0.0915)	(0.0907)	(0.0901)	(0.0906)
Divorced	0.0198	0.0201	0.0189	0.0161
	(0.0434)	(0.0433)	(0.0434)	(0.0436)
Couple, no children	0.276***	0.275***	0.274***	0.276***
	(0.0429)	(0.0430)	(0.0431)	(0.0429)
Couple with dependents/children	0.362***	0.363***	0.359***	0.363***
	(0.0546)	(0.0546)	(0.0546)	(0.0545)
Couple with non-dependent children	0.311***	0.311***	0.310***	0.311***
	(0.0197)	(0.0197)	(0.0198)	(0.0197)
Lone parent with non-dependent children	0.179***	0.178***	0.177***	0.181***
	(0.0391)	(0.0392)	(0.0394)	(0.0388)
Lone parent with dependents/children	0.0217	0.0220	0.0174	0.0245
	(0.0427)	(0.0427)	(0.0430)	(0.0426)
Other household type	-0.101*	-0.101*	-0.106*	-0.102*
	(0.0547)	(0.0547)	(0.0548)	(0.0547)

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Household disposable income 0,000s	0.0235***	0.0234***	0.0234***	0.0234***
	(0.00216)	(0.00217)	(0.00216)	(0.00216)
Employed full-time	0.157***	0.157***	0.156***	0.157***
	(0.0234)	(0.0234)	(0.0233)	(0.0234)
Employed part-time	0.128***	0.128***	0.130***	0.128***
	(0.0258)	(0.0258)	(0.0257)	(0.0258)
Underemployed	-0.105***	-0.106***	-0.106***	-0.104***
	(0.0388)	(0.0389)	(0.0389)	(0.0388)
Postgraduate	0.0238	0.0253	0.0301	0.0238
	(0.0416)	(0.0415)	(0.0414)	(0.0416)
Graduate certificate/diploma	0.0953***	0.0929***	0.100***	0.0934***
	(0.0343)	(0.0344)	(0.0341)	(0.0344)
Bachelor	0.0912***	0.0917***	0.0974***	0.0918***
	(0.0247)	(0.0246)	(0.0246)	(0.0246)
Diploma	0.0776***	0.0776***	0.0813***	0.0787***
	(0.0285)	(0.0284)	(0.0283)	(0.0284)
Certificate	0.0452**	0.0456**	0.0456**	0.0462**
	(0.0230)	(0.0230)	(0.0230)	(0.0230)
Year 12	0.0821***	0.0817***	0.0844***	0.0830***
	(0.0249)	(0.0249)	(0.0248)	(0.0249)
Victoria	0.0392*	0.0400*	0.0415**	0.0383*
	(0.0209)	(0.0209)	(0.0209)	(0.0209)
Queensland	0.0220	0.0230	0.0217	0.0213
	(0.0216)	(0.0216)	(0.0216)	(0.0217)
South Australia	0.0343	0.0361	0.0341	0.0339
	(0.0291)	(0.0291)	(0.0291)	(0.0291)
Western Australia	0.0434	0.0437	0.0426	0.0427
	(0.0289)	(0.0289)	(0.0290)	(0.0289)
Tasmania	0.142***	0.144***	0.142***	0.143***
	(0.0380)	(0.0378)	(0.0380)	(0.0379)
Northern Territory	-0.00423	-0.00438	-0.00673	-0.00497
	(0.0801)	(0.0801)	(0.0804)	(0.0801)
Australian Capital Territory	0.0388	0.0392	0.0433	0.0410
	(0.0534)	(0.0533)	(0.0531)	(0.0533)
Life satisfaction (1–10)	0.0109*	0.0108*	0.0107*	0.0111*
	(0.00572)	(0.00572)	(0.00573)	(0.00572)
Ever received a bequest	0.0330			

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
	(0.0288)			
Total amount of bequest received across sample frame (ten '000s of dollars)		0.00436*		
		(0.00238)		
Ever received a gift			-0.0349*	
			(0.0209)	
Total amount of gift received across sample frame (ten '000s of dollars)				0.00953
				(0.00584)
Observations	4,581	4,581	4,581	4,581

Notes: As above

Table A3: Sample 3—Marginal effects estimates on individuals aged between 25–65 and outright home owners vs mortgagors and renters

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Male	-0.00826	-0.00938	-0.00984	-0.00954
	(0.0100)	(0.0100)	(0.0100)	(0.0100)
Age	0.0141***	0.0142***	0.0142***	0.0143***
	(0.000510)	(0.000510)	(0.000519)	(0.000509)
Number of children	-0.00368	-0.00440	-0.00462	-0.00451
	(0.00760)	(0.00760)	(0.00760)	(0.00760)
Number of siblings	-0.0138***	-0.0138***	-0.0143***	-0.0141***
	(0.00221)	(0.00221)	(0.00221)	(0.00221)
Born in main English-speaking country	-0.0492***	-0.0492***	-0.0489***	-0.0494***
	(0.0137)	(0.0137)	(0.0137)	(0.0137)
Born in main non-English-speaking country	-0.0112	-0.0137	-0.0161	-0.0157
	(0.0137)	(0.0136)	(0.0135)	(0.0135)
Married	-0.282***	-0.283***	-0.282***	-0.281***
	(0.0298)	(0.0298)	(0.0298)	(0.0298)
De facto	-0.229***	-0.229***	-0.229***	-0.229***
	(0.0126)	(0.0126)	(0.0127)	(0.0127)
Separated	-0.111***	-0.112***	-0.113***	-0.113***
	(0.0185)	(0.0185)	(0.0183)	(0.0183)
Widowed	0.00538	0.00974	0.00927	0.00965
	(0.0371)	(0.0376)	(0.0374)	(0.0375)
Divorced	-0.109***	-0.109***	-0.110***	-0.110***
	(0.0147)	(0.0147)	(0.0147)	(0.0147)

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Couple, no children	0.347***	0.348***	0.345***	0.344***
	(0.0372)	(0.0372)	(0.0372)	(0.0371)
Couple with dependents/children	0.279***	0.281***	0.278***	0.277***
	(0.0364)	(0.0364)	(0.0364)	(0.0364)
Couple with non-dependent children	0.409***	0.409***	0.404***	0.404***
	(0.0399)	(0.0399)	(0.0400)	(0.0399)
Lone parent with non-dependent children	0.235***	0.235***	0.233***	0.234***
	(0.0363)	(0.0363)	(0.0363)	(0.0363)
Lone parent with dependents/children	-0.0303	-0.0322	-0.0323	-0.0314
	(0.0264)	(0.0262)	(0.0262)	(0.0263)
Other household type	-0.0307	-0.0320	-0.0334	-0.0329
	(0.0326)	(0.0325)	(0.0323)	(0.0323)
Household disposable income 0,000s	0.000500	0.000401	0.000502	0.000519
	(0.000774)	(0.000775)	(0.000773)	(0.000773)
Employed full-time	-0.0891***	-0.0882***	-0.0893***	-0.0886***
	(0.0125)	(0.0125)	(0.0125)	(0.0125)
Employed part-time	-0.0263*	-0.0252*	-0.0254*	-0.0254*
	(0.0140)	(0.0140)	(0.0140)	(0.0140)
Underemployed	-0.0262	-0.0284	-0.0275	-0.0275
	(0.0207)	(0.0206)	(0.0206)	(0.0206)
Postgraduate	0.0208	0.0209	0.0240	0.0225
	(0.0233)	(0.0233)	(0.0235)	(0.0234)
Graduate certificate/diploma	0.0142	0.0143	0.0163	0.0142
	(0.0203)	(0.0203)	(0.0204)	(0.0203)
Bachelor	0.0171	0.0174	0.0210	0.0192
	(0.0158)	(0.0158)	(0.0160)	(0.0159)
Diploma	0.0216	0.0226	0.0244	0.0236
	(0.0176)	(0.0177)	(0.0177)	(0.0177)
Certificate	0.0129	0.0131	0.0137	0.0137
	(0.0135)	(0.0135)	(0.0135)	(0.0135)
Year 12	0.0190	0.0196	0.0216	0.0207
	(0.0171)	(0.0171)	(0.0172)	(0.0171)
Victoria	-0.000536	-0.000224	0.000157	-0.000595
	(0.0122)	(0.0122)	(0.0122)	(0.0122)
Queensland	-0.0269**	-0.0256**	-0.0264**	-0.0267**
	(0.0124)	(0.0125)	(0.0125)	(0.0124)
South Australia	-0.0290*	-0.0272*	-0.0285*	-0.0287*

Variable name	(1)	(2)	(3)	(4)
	Model 1	**Model 2**	**Model 3**	**Model 4**
	(0.0158)	(0.0159)	(0.0158)	(0.0158)
Western Australia	-0.0448***	-0.0452***	-0.0456***	-0.0455***
	(0.0154)	(0.0154)	(0.0154)	(0.0154)
Tasmania	-0.00332	-0.00157	-0.00250	-0.00236
	(0.0270)	(0.0271)	(0.0270)	(0.0270)
Northern Territory	-0.0522	-0.0524	-0.0527	-0.0524
	(0.0441)	(0.0440)	(0.0438)	(0.0439)
Australian Capital Territory	-0.0679***	-0.0658**	-0.0647**	-0.0654**
	(0.0259)	(0.0261)	(0.0262)	(0.0261)
Life satisfaction (1–10)	0.0146***	0.0147***	0.0149***	0.0149***
	(0.00323)	(0.00323)	(0.00323)	(0.00323)
Ever received a bequest	0.0563***			
	(0.0158)			
Total amount of bequest received across sample frame (ten ‘000s of dollars)		0.00222***		
		(0.000688)		
Ever received a gift			-0.0160	
			(0.0149)	
Total amount of gift received across sample frame (ten ‘000s of dollars)				0.00248
				(0.00261)
Observations	8,672	8,672	8,672	8,672

Notes: As above

Table A4: Sample 4—Marginal effects estimates on individuals aged between 25–45 and outright home owners vs. mortgagors and renters

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
Male	0.00262	0.00217	0.00276	0.00307
	(0.00998)	(0.00998)	(0.0100)	(0.00999)
Age	0.00709***	0.00704***	0.00708***	0.00717***
	(0.000784)	(0.000784)	(0.000800)	(0.000785)
Number of children	-0.00382	-0.00409	-0.00402	-0.00405
	(0.00602)	(0.00601)	(0.00602)	(0.00602)
Number of siblings	-0.00554**	-0.00552**	-0.00579**	-0.00555**
	(0.00261)	(0.00261)	(0.00263)	(0.00262)
Born in main English-speaking country	-0.0284**	-0.0276*	-0.0275*	-0.0272*
	(0.0141)	(0.0142)	(0.0143)	(0.0143)
Born in main non-English-speaking country	0.00814	0.00718	0.00481	0.00550
	(0.0145)	(0.0144)	(0.0142)	(0.0143)
Married	-0.204***	-0.202***	-0.203***	-0.203***
	(0.0304)	(0.0303)	(0.0304)	(0.0304)
De facto	-0.145***	-0.145***	-0.145***	-0.145***
	(0.0126)	(0.0126)	(0.0126)	(0.0126)
Separated	-0.0480***	-0.0483***	-0.0496***	-0.0495***
	(0.0181)	(0.0180)	(0.0178)	(0.0177)
Widowed	0.0115	0.0141	0.0147	0.0141
	(0.0814)	(0.0833)	(0.0839)	(0.0835)
Divorced	-0.0391**	-0.0391**	-0.0402**	-0.0415**
	(0.0175)	(0.0175)	(0.0174)	(0.0171)
Couple, no children	0.361***	0.357***	0.357***	0.358***
	(0.0628)	(0.0627)	(0.0626)	(0.0627)
Couple with dependents/children	0.234***	0.234***	0.232***	0.233***
	(0.0349)	(0.0349)	(0.0349)	(0.0349)
Couple with non-dependent children	0.541***	0.540***	0.534***	0.537***
	(0.0540)	(0.0540)	(0.0541)	(0.0541)
Lone parent with non-dependent children	0.385***	0.385***	0.385***	0.389***
	(0.0627)	(0.0627)	(0.0626)	(0.0626)
Lone parent with dependents/children	0.0183	0.0190	0.0167	0.0194
	(0.0297)	(0.0299)	(0.0296)	(0.0300)
Other household type	-0.0303	-0.0311	-0.0336	-0.0328

Variable name	(1)	(2)	(3)	(4)
	Model 1	Model 2	Model 3	Model 4
	(0.0299)	(0.0296)	(0.0288)	(0.0291)
Household disposable income 0,000s	0.000817	0.000780	0.000794	0.000805
	(0.000722)	(0.000724)	(0.000724)	(0.000723)
Employed full-time	-0.0432***	-0.0423***	-0.0438***	-0.0432***
	(0.0133)	(0.0133)	(0.0134)	(0.0133)
Employed part-time	-0.00651	-0.00571	-0.00564	-0.00598
	(0.0141)	(0.0142)	(0.0142)	(0.0142)
Underemployed	-0.0108	-0.0129	-0.0120	-0.0111
	(0.0181)	(0.0178)	(0.0180)	(0.0181)
Postgraduate	-0.00441	-0.00310	-0.00252	-0.00387
	(0.0219)	(0.0222)	(0.0224)	(0.0221)
Graduate certificate/diploma	0.00238	-1.75e-05	0.00384	0.00114
	(0.0201)	(0.0199)	(0.0204)	(0.0200)
Bachelor	-0.00384	-0.00327	-0.000960	-0.00181
	(0.0140)	(0.0141)	(0.0143)	(0.0142)
Diploma	0.0104	0.0113	0.0121	0.0121
	(0.0173)	(0.0173)	(0.0175)	(0.0175)
Certificate	0.00184	0.00195	0.00212	0.00257
	(0.0133)	(0.0133)	(0.0133)	(0.0133)
Year 12	0.00466	0.00469	0.00632	0.00601
	(0.0153)	(0.0153)	(0.0154)	(0.0154)
Victoria	-0.00591	-0.00630	-0.00604	-0.00724
	(0.0111)	(0.0111)	(0.0112)	(0.0111)
Queensland	-0.0220**	-0.0216*	-0.0227**	-0.0229**
	(0.0111)	(0.0111)	(0.0110)	(0.0110)
South Australia	-0.0143	-0.0133	-0.0151	-0.0153
	(0.0152)	(0.0153)	(0.0151)	(0.0151)
Western Australia	-0.0150	-0.0145	-0.0162	-0.0162
	(0.0150)	(0.0150)	(0.0149)	(0.0149)
Tasmania	0.00827	0.0104	0.00840	0.00916
	(0.0254)	(0.0257)	(0.0254)	(0.0255)
Northern Territory	-0.0246	-0.0254	-0.0271	-0.0266
	(0.0383)	(0.0380)	(0.0374)	(0.0375)
Australian Capital Territory	-0.0347	-0.0336	-0.0329	-0.0330
	(0.0228)	(0.0231)	(0.0234)	(0.0232)
Life satisfaction (1–10)	0.00865***	0.00854***	0.00883***	0.00878***
	(0.00327)	(0.00327)	(0.00327)	(0.00327)

Variable name	(1)	(2)	(3)	(4)
	Model 1	**Model 2**	**Model 3**	**Model 4**
Ever received a bequest	0.0428**			
	(0.0189)			
Total amount of bequest received across sample frame (ten '000s of dollars)		0.00281***		
		(0.000864)		
Ever received a gift			-0.00586	
			(0.0115)	
Total amount of gift received across sample frame (ten '000's of dollars)				0.00383*
				(0.00216)
Observations	4,581	4,581	4,581	4,581

Notes: As above

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