Nguyen, Ha Trong; Mitrou, Francis; Zubrick, Stephen R.

**Working Paper**

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# Retirement, housing mobility, downsizing and neighbourhood quality - A causal investigation

Ha Trong Nguyen*, †
Francis Mitrou†
Stephen R. Zubrick†

This paper provides the first causal evidence on the impact of retirement on housing choices. Our empirical strategy exploits the discontinuity in the eligibility ages for state pension as an instrument for the endogenous retirement decision and controls for time-invariant individual characteristics. The results show that retirement leads to a statistically significant and sizable increase in the probability of making a residential move or the likelihood of becoming outright homeowners. We also find that individuals downsize both physically and financially and tend to move to better neighbourhoods or closer to the coast upon retirement. We additionally discover that some housing adjustments take place up to 6 years before retirement. Moreover, our results reveal significant heterogeneity in the retirement impact by gender, marital status, education, housing tenue, income and wealth. Within couple households, housing mobility choices are primarily influenced by the wife's retirement while housing downsizing decisions are only affected by the husband's retirement. The results suggest that failing to address the endogeneity of retirement often under-states the retirement impact on such housing arrangements.

**Keywords**: Retirement; Housing; Migration; Residential Mobility; Quality of Neighbourhood; Downsizing; Instrumental Variable.
**JEL classifications:** J14; J26; J61; R21; R23.

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* **Corresponding author**: Telethon Kids Institute | Tel: +61 8 6319 1019 | Postal: GPO Box 855, Perth WA 6872, Australia | Email: ha.nguyen@telethonkids.org.au.
† Human Capital Team, Telethon Kids Institute & Institute of Child Health Research, The University of Western Australia.
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## 1. Introduction

Population ageing has led to increasing interests among policy makers and researchers in the work, consumption and wealth trajectories of older individuals. One particular interest is the way that housing wealth, which represents the largest share in the household wealth portfolio of the elderly in developed countries (Chiuri & Jappelli 2010), is accumulated before retirement and how that home equity is drawn on after retirement (Productivity Commission 2015). The empirical study of housing choices at older ages has a long history, dating back to an early US study by Venti & Wise (1989). Evidence from this work and subsequent studies is quite mixed regarding the extent to which individuals adjust their housing wealth in the form of housing mobility or housing downsizing around the time of retirement (Whelan *et al.* 2019). This inconclusive evidence partly reflects the methodological differences across studies using datasets from countries with heterogeneous socioeconomic institutions (see Section 2 for a review).

Our study contributes to this literature by exploring the causal impact of retirement on the geographic mobility and housing downsizing of older Australians. The key challenge in assessing the causal impact of retirement on housing choices originates from the possibility that retirement, usually modelled as a choice, is endogenous in the housing decision equation. In turn, there are three main factors behind this potential endogeneity of retirement (Wooldridge 2010). First, there may be unobservable individual factors (e.g., an individual's discount rate, work ethic or ability) that are correlated with both retirement and housing choices (Peri & Buetikofer 2020). Second, reverse causality could be an issue as individuals with higher levels of housing wealth might be more likely to withdraw from the labour force earlier. Third, measurement error issues are also likely as objective measures of retirement are not always available in survey data and researchers are constrained to use retirement measures reported by respondents. Respondents' reports of their retirement status may be influenced by their housing conditions, leading to biased estimates of the retirement effects. The current literature has not successfully dealt with the potential endogeneity of retirement, leaving the causal impact of retirement on housing choices in question.

We address the above research challenge by employing an instrumental variables (IV) method which exploits discontinuity in the probability of retiring at state pension eligibility ages to construct an instrumental variable to identify the retirement equation. A similar approach using state pension eligibility ages as instruments has been successfully employed to draw causal impacts of retirement on various non-housing outcomes by numerous international (Coe & Zamarro 2011; Bonsang *et al.* 2012; Bíró & Elek 2018; Frimmel & Pruckner 2020) and Australian (Zhu 2016; Atalay *et al.* 2019b; Binh Tran & Zikos 2019) studies. The Australian policy setting also supports the use of this instrument to identify the causal impact of retirement on housing choices (more details in following sections). We apply this IV method to panel data in a fixed effects instrumental variables (FE-IV) model, thus simultaneously accounting for both time-invariant and time-variant unobserved individual heterogeneity. To our knowledge, this current paper is the first to apply this empirical approach to investigate the causal impact of retirement on housing choices.

Using 19 waves of high-quality data from the Household Income and Labour Dynamics in Australia (HILDA) survey and a FE-IV model, we present seven main findings. First, our results show that retirement substantially increases the likelihood of making a residential move as well as the probability of becoming outright homeowners. Second, we uncover that retirement causes individuals to downsize both physically and financially. Third, our investigation into the intertemporal retirement impact reveals that some housing adjustments, including residential mobility, paying off mortgages and downsizing, occur even before retirement. Fourth, our results suggest that individuals are likely to move to better neighbourhoods or closer to the coast upon retirement.

Fifth, our extended heterogeneity analysis shows significant differences in the retirement impact by gender, marital status, education, homeownership status, income and wealth. For instance, we find that the impact of retirement on residential mobility is mainly driven by individuals who are female, single, less educated, or have lower income. Furthermore, we present new evidence that, within couple households, housing mobility choices are primarily influenced by the wife's retirement while housing downsizing decisions are only affected by the husband's retirement. Sixth, our results suggest that failing to adequately account for the endogeneity of retirement often under-states the retirement impact on such housing adjustments. Finally, we find the pattern of results is robust to various sensitivity checks, including the sample attrition issues, the functional forms for age and the inclusion of time-variant characteristics.

The rest of this paper proceeds as follows: in Section 2 we review related studies around retirement and housing choices. We discuss the Australian policy context in Section 3 before introducing our data in Section 4. We explain our empirical models in Section 5 and present main results in Section 6. Section 7 provides results from several robustness checks while Section 8 represents a heterogeneity investigation and additional results. Section 9 concludes.

## 2. Literature review

This study contributes to a rich literature focusing on factors determining housing choices of individuals in later life.[1] This literature demonstrates that housing transitions of older individuals are often associated with demographic changes, especially those linked with marital status or children living the parental home, health shocks, including the deterioration of own health and death of spouse, and labour market transitions (Feinstein & McFadden 1989; Angelini *et al.* 2014; Herbers *et al.* 2014; Whelan *et al.* 2019). Within this literature, there is a limited number of studies exclusively considering the relationship between retirement and housing choices of older individuals. For instance, an early work by Venti & Wise (1989) reported that moving home is

[1] See, for instance, a recent review by Whelan *et al.* (2019). There is a substantial and related literature that explores the complex relationship between job moving and residential moving of younger individuals (Greenwood 1997; Van Ommeren *et al.* 1999).

strongly associated with retirement of the elderly in the US. Similarly, Ermisch & Jenkins (1999) documented that geographic mobility is positively associated with the retirement status of UK older individuals and their spouses. Furthermore, they found that, among those who moved, there is a strong reduction in the number of bedrooms and a less significant decrease in housing value. Using US and UK data, Banks *et al.* (2010; 2012) also found evidence of a strong and positive association between retirement and geographic mobility in both countries. However, in their earlier work, Banks *et al.* (2010) did not find a significant correlation between retirement and a reduction in the number of bedrooms in either the UK or the US.

Studies have also explored factors associated with housing choices of older Australians (Judd *et al.* 2014; Productivity Commission 2015; James *et al.* 2020). Among Australian studies, there are two studies directly examining the relationship between retirement and housing choices by including labour market status variables in housing choice equations. In particular, Ong *et al.* (2015) used release 10 of HILDA data and a random effects (RE) multinominal logit model to consider the factors associated with housing equity withdrawal decisions of homeowners aged 45 or over. Their results indicate that, among homeowners who did not move to a new house between two adjacent survey waves, retirement is negatively associated with the probability of reporting an increase in mortgage debt. However, they did not find any statistically significant association between labour market status and the likelihood of moving home or becoming a renter in the following wave. Our work is more closely related to a recent study by Whelan *et al.* (2019) who investigated patterns and determinants of housing choices among older Australians. Specifically, they used release 17 of HILDA data and a fixed effects (FE) model to examine factors affecting housing choices of homeowners aged 55 or older. One of their main findings is that the transitions in or out of the labour force of the individual or their partner are positively correlated with the residential mobility probability. However, they found little evidence that physical or financial downsizing is associated with own or spousal work transitions.

The above review indicates that while there is an increasing number of studies explicitly considering the relationship between retirement and housing choices of older individuals, the extant literature has not successfully dealt with the potential endogeneity of retirement due to the limitations of employed empirical methods. Thus far, studies have mainly addressed the endogeneity issue by controlling for a rich list of explanatory variables (Ong *et al.* 2015) or controlling for individual time-invariant unobservable factors through the means of a RE (Ong *et al.* 2015), first difference (Banks *et al.* 2012) or FE model (Whelan *et al.* 2019). These methods while helping to address the endogeneity issue associated with unobservable individual heterogeneity, cannot deal with the issues related to the reverse causality and measurement error.

We build on these studies to employ both individual FE and IV approaches in a unified framework to provide more robust estimates on the causal impact of retirement on housing choices of older individuals. Thus, this paper contributes to the literature as the first to provide evidence on the causal impact of retirement on housing choices. In addition to this primary contribution, by using a unique empirical method and rich data, this paper makes two other potentially important contributions to this literature. First, the current literature typically considers the effects of various life course events, including retirement, on housing choices in later life and hence abstracts from examining the intertemporal impact of retirement. This paper extends the literature by exploring the impact of retirement on outcomes which are measured over an extended number of years around the retirement time. This extension recognizes the illiquid nature as well as the important role of housing wealth (Yates & Bradbury 2010; Guren *et al.* 2020) and helps provide greater insight into pre- and post-retirement housing trajectories. Second, a few studies in this literature have compared the impact of retirement on housing choices for some sub-groups, identifed by either housing tenure (Venti & Wise 1989; Ermisch & Jenkins 1999; Whelan *et al.* 2019) or marital status (Whelan et al. 2019). This study goes further by exploring the heterogeneous retirement impact for other sub-groups, characterised by gender, education, income and wealth, and hence offers the most comprehensive heterogenous analysis of the effect available in this literature. This extensive heterogenous analysis does not only help advance our understanding of the impact of retirement on housing choices but also shed light on the potential mechanisms through which retirement may affect housing choices.

## 3. Australian retirement income system

The Australian retirement income system comprises of three pillars. The first pillar is a publicly funded means-tested Age Pension. The primary aim of the Age Pension is to provide an income safety net for the elderly (Department of Social Services 2020). To be eligible for the Age Pension, individuals need to satisfy an income and asset test and age and residency requirements. The residency requirement states that individuals need to have been an Australian resident for a total of at least ten years.[2] The eligibility age for the Age Pension has changed over time and by gender, as described in Appendix Figure A1. For instance, the eligibility age for both males and females was increased from 66 to 66.5 years of age from 1st July 2021. In this study, we will exploit discontinuity in the probability of retiring at these exogenously determined pension eligibility ages (PEA) as an instrument to identify the causal impact of retirement on housing choices. The level of entitlement to the Age Pension depends on an income and asset test which specifies respective thresholds for income and assets above which a nil rate is applied. Older Australians can continue to work whilst eligible for the Age Pension, but their increased private income earned from paid work or other investment sources will reduce the Age Pension. An important feature of the means-tested Age Pension is that the principal residence, which is the focus of the current paper, is exempted from the asset test.[3]

The second pillar of the Australian retirement income system is the Superannuation Guarantee (SG) which commenced in 1992 (Kingston & Thorp 2019). The SG requires employers to contribute a

[2] We experimented with excluding a very small number (i.e., less than 1%) of individuals in our final sample who were born overseas and have arrived in Australia for less than ten years before the survey time and found similar results.
[3] This exemption combined with the exemption of imputed rent and capital gains of the principal residence from income tax, in theory, can motivate individuals to relocate their asset portfolio toward the primary residence upon retirement (Disney 2010).

specific minimum rate of an employee's earnings to their superannuation fund. The contribution rates were progressively increased from 3% to 9% between 1992 and 2002 (Cassell *et al.* 2020). The minimum employer contribution rate was increased to its current level of 9.5% in 2014. Individuals can access their superannuation, in the form of a lump sum, a superannuation income stream or a combination of both, when they (i) turn 65 (even if they have not retired) or (ii) reach preservation age and retire (Australian Taxation Office, ATO 2021). The current preservation ages, which are set according to date of birth, range from 55 to 60 years of age (ATO 2021). The fact that the preservation ages are not the same as the eligibility ages for the Age Pension also facilitates the use of the discontinuity around the PEA as an instrument for the retirement decision.

The third pillar of the Australian retirement income system is voluntary savings, including non-compulsory superannuation, other private savings, or income-generating assets. Despite the increasing role of private income sources to retirement income for older Australians, the Age Pension remains the most common income stream for them, with about 63% of individuals aged over 64 receiving either a full or part Age Pension in 2019 (Cassell *et al.* 2020).

## 4. Data and sample

### *4.1. Data*

Our main data source is from the Household Income and Labour Dynamics in Australia (HILDA) survey. HILDA is a nationally representative longitudinal survey of private households in Australia. It contains rich information at the individual and household level, including information on individuals' labor-market status and housing conditions. One appealing feature of HILDA is that state of residence is available in every year and individuals are followed to new locations if they move (Summerfield *et al.* 2019). Thus, the sample remains broadly representative of the Australian population, allowing us to study housing choices over time. We utilize the most recent release of HILDA which contains 19 waves of data and covers a period from 2001 to 2019 for this study.

We follow previous studies (Ermisch & Jenkins 1999; Banks *et al.* 2012; Whelan *et al.* 2019) to consider three variables capturing a physical residential move. The first variable is an indicator describing the likelihood that an individual makes any residential change in the period between the two interview waves (thereafter called "residential mobility"). We further distinguish a residential move by geographical location, defining whether (i) the individual moves across Local Government Areas (LGA)[4] between two adjacent survey waves ("inter-LGA mobility") or (ii) the individual relocates from one state/territory in one survey wave to another state/territory in the next survey wave ("inter-state mobility"). We employ a new measure called "relocation distance" to capture the distance of the residential movement. This measure has been calculated by the custodian of HILDA, using a great circle formula applied to latitude and longitude of the previous and current geocoded addresses (Summerfield *et al.* 2019). By construction, all above residential mobility variables are available from wave 2 of HILDA onwards.

We further employ six indicators which broadly measure housing consumption. The first indicator, which is usually classified as "physical" housing consumption (Ong *et al.* 2015; Whelan *et al.* 2019), describes whether the individual lives in a "separate house" (versus a semi-detached house/flat/unit/apartment). We also use the "number of bedrooms" in the residence to measure physical housing consumption. Furthermore, we construct two "financial" housing consumption variables describing whether (i) the individual lives in a home which is owned outright by any household member ("outright homeowner") or (ii) the individual resides in a home where its mortgage is being paid off ("mortgaged homeowner").[5] We additionally capture "financial" housing consumption by using "home value" (as reported by homeowners) or "monthly rent" (as reported

[4] LGAs are Australian Bureau of Statistic (ABS)'s approximation of gazetted local government boundaries as defined by each state and territory local government department. In 2020, there are 562 LGAs in Australia.
[5] The remaining and omitted housing tenue group is renters. Our data show that the majority (about 93%) of individuals who are identified as "homeowners" in our final sample own or co-own the residential home and there is no difference in the home ownership status by gender. Unfortunately, information on which household members own the residential home is only available in waves 2, 6, 10, 14 and 18 of the HILDA so we cannot directly include this information in our analysis.

by renters).[6] Except the separate house variable which is reported by the interviewer and available from wave 2 of HILDA onwards, all other housing consumption variables are reported by the respondents and available in all waves.

### *4.2. Sample*

Throughout this paper, the unit of analysis is the individual. We follow prior Australian studies (Zhu 2016; Atalay *et al.* 2019b; Nguyen *et al.* 2020) to restrict the analytical sample to individuals aged between 55 and 75 years old during the study window. We additionally focus on a sample of individuals who are observed on at least two occasions because we will mainly employ an individual FE model in this analysis. We further exclude individuals with missing information on any variable used in our empirical model (more on this in following sections). These restrictions result in a final sample which varies by housing outcomes. For instance, the maximum sample size is observed for the number of bedroom variable, with 66,494 individual-year observations from 7,933 unique individuals obtained over 19 years of data.

[Table 1 around here]

Summary statistics for key covariates and housing outcomes by retirement status of individuals in the main sample are represented in Table 1. From this table, we observe that, as compared to working individuals, retired individuals are more likely to be female, older, not in a marital relationship, or immigrants, or have lower education. Moreover, retired individuals tend to live in households with a higher share of elderly members or reside in areas with lower local property prices.[7] Table 1 also shows that while there is no statistically significant difference in the residential

[6] The "home value" variable is derived from response to a question asking: "What is the approximate value of your home today? I mean, how much would it bring if you sold it today? Include land, home improvements, and fixtures (such as curtains and light fittings) usually sold with a home. Exclude home contents." All monetary variables are adjusted for inflation, using 2010 consumer price index as the base.

[7] The age profile of housing choices, reported in Appendix Figure A2, is in line with patterns documented in the international (Chiuri & Jappelli 2010) and Australian (Judd *et al.* 2014; Productivity Commission 2015) studies. For instance, our results show that, after age 25, residential mobility rates tend to decrease with age and only increase after age 85, a pattern mostly likely coincides with the older individuals' transitions to care facilities later in life. This life-cycle pattern of housing choices suggests a need to control for ages in the regression. Moreover, we do not observe any

mobility probability between retired and non-retired individuals, retired individuals are more likely to (i) make an inter-LGA or inter-state residential movement or (ii) have greater relocation distance. Likewise, retired individuals are more likely to live in non-separate properties or in properties with fewer bedrooms, lower estimated values, or lower rents. By contrast, retired individuals are much more likely to own homes outright than working individuals. As discussed above, these simple correlations between retirement and housing choices do not account for the issues of individual heterogeneity, reverse causality, or measurement error.[8] These issues will be addressed in the following sections.

## 5. Empirical models

The following model is employed to explore the impact of retirement on housing choice outcome $Y$ of individual $i$ at time $t$:

$$Y_{i,t} = \alpha + \beta R_{i,t} + X_{i,t}\gamma + \delta_i + \mu_{i,t} \qquad (1)$$

In equation (1), $R$ denotes the retirement status, $X_{i,t}$ is a vector of individual or household characteristics, $\delta_i$ represents time-invariant individual unobservable factors, and $\mu_{i,t}$ is an idiosyncratic error term. $\alpha, \beta$ and $\gamma$ are parameters to be estimated and $\beta$ is our main parameter of interest.

We follow previous studies (Banks *et al.* 2012; Whelan *et al.* 2019) to include in $X_{i,t}$ a set of characteristics contributing to the individual's housing choices such as the individual characteristics (e.g., gender, age (and its square), ethnicity, migration status, marital status, and education levels),

substantial and sudden change in housing choices within the 55-75 age window, a pattern supporting our empirical method to employ the discontinuity in the PEA as an instrument.

[8] Appendix Figure A3 depicts housing choices around the PEA cut-off. It shows a visible jump in the residential mobility rates as well as the relocation distance when individuals reach their pension eligible ages. It also displays an apparent drop in home values and rents and a slightly less visible fall in the number of bedrooms or in the probability of living in a separate dwelling around the PEA cut-off. However, we do not observe any noticeable change in the housing tenure choices around the PEA cut-off. While these changes in housing outcomes around the PEA cut-off may be viewed as the reduced form estimates of the retirement, they do not control for time-invariant and time-variant explanatory variables.

household characteristics (e.g., number of household members at various age groups), and neighbourhood characteristics.[9] We additionally control for temporal or spatial differences in housing choices by including dummies for years and quarters of survey time and state/territory dummies in all regressions.

While the above fixed effects (FE) regression model (1) controls for time-invariant individual characteristics, it cannot deal with problems associated with reverse causality and measurement error. Adapting from previous studies (Nishimura *et al.* 2018; Atalay *et al.* 2019b), we further address the potential endogeneity of retirement by using an instrumental variables (IV) approach, employing an auxiliary equation for the retirement decision:

$$R_{i,t} = \rho + X_{i,t}\sigma + Z_{i,t}\tau + \delta_i + \varphi_{i,t} \qquad (2)$$

In equation (2), $Z_{i,t}$ is an instrument, $\varphi_{i,t}$ is an error term, and $\rho, \sigma$ and $\tau$ are vectors of parameters to be estimated. $X_{i,t}$ and $\delta_i$ are defined as in equation (1).

We build on a very rich literature focusing on the causal impact of retirement (Heller-Sahlgren 2017; Nishimura *et al.* 2018)[10] to exploit discontinuity in the probability of retiring at exogenously determined eligibility ages for state pension to construct an instrumental variable to identify the retirement equation (2). In particular, we employ an instrumental variable which takes a value of one if an individual's age is equal or greater than the pension eligibility age set at the survey time and zero if otherwise. We include this variable in the retirement equation (2) in addition to a second-order polynomial of age. As documented in this extensive literature, this instrumental variable is plausible to satisfy three conditions to be a good instrument (Wooldridge 2010), namely (i) it is

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[9] Local variables include regional unemployment rates, an index of relative socio-economic disadvantage, a metropolitan dummy and local property prices. We measure the local property prices by matching yearly mean price of all transactions at postcode level where the individual resided at the same year. Historical data on postcode-level property prices are obtained from CoreLogic (https://www.corelogic.com.au).

[10] Australian studies have also followed this approach when examining the causal effects of retirement on health (Zhu 2016; Binh Tran & Zikos 2019), cognitive functioning (Atalay *et al.* 2019b), life satisfaction (Nguyen *et al.* 2020) and social support (Kettlewell & Lam 2020).

sufficiently correlated with the retirement decision, (ii) it must be uncorrelated with $Y_{i,t}$ except via $R_{i,t}$, and (iii) it cannot be associated with unobserved individual time-variant characteristics in the housing choice equation ($\mu_{i,t}$). Because this instrument varies over time for the same individuals, we can apply the IV approach to panel data in a FE-IV model, thus simultaneously controlling for time-invariant and time-variant unobserved individual characteristics.

It should be noted that although our identification strategy considers the changes in the pension eligibility ages for women and men during the study period (see Appendix Figure A1), it primarily exploits the discontinuous changes in the probability of retiring around the pension eligibility ages. Moreover, while our empirical method is in the spirit of the traditional fuzzy regression discontinuity design (RDD) (Lee & Lemieux 2010), its identification assumptions are different from that of the RDD. In particular, the RDD compares variations in housing outcomes between individuals, basing on an assumption that individuals on either side of, but close to, the pension eligibility age can only differ in their likelihood of being retired. Instead, our IV-FE model focuses on the variation in housing outcomes within individuals, presuming that merely crossing the pension eligibility age cut-off will not influence an individual's housing choice around the cut-off, except through retirement. As described in Section 3, the Australian policy setting, including the exemption of the primary residence from the Age Pension asset test and the difference between superannuation preservation ages and PEA, suggests that this assumption is likely to hold. In Section 7, we will alleviate a concern that some unobserved time-variant variables are potentially associated with our instrument (i.e., the criterium (iii)) by controlling for numerous time-variant variables, including income and health, in the regression.

Like other studies employing an IV strategy, the IV estimates in this paper measure a local average treatment effect (LATE) of retirement on housing choices (Imbens & Angrist 1994). Specifically, the LATE is applicable to individuals who retire because they reach the Age Pension eligibility ages. For ease of interpretation, we use Ordinary Least Squared (OLS) method to estimate equation

(1) and conduct a two-stage least squares (2SLS) regression method for the FE-IV model.[11] To strengthen the statistical power of our estimates and for concentration purposes, in the main analysis, we will estimate these equations using a sample of all individuals observed in the data. In Section 8 we will explore the potential heterogeneous impact of retirement by various characteristics, including gender, marital status and education of the respondents.

While housing consumption variables described above are usually associated with a residential move, some of them, including homeownership status, number of bedrooms or home value, may change over time independent of a residential move. For instance, mortgaged homeowners could pay off the mortgage of their current residential home and thus become outright homeowners. Likewise, individuals, especially homeowners, may renovate their homes by changing the number of bedrooms or increasing home value over time without a need of a residential move. In such cases, our modelling approach captures the impact of retirement on housing consumption. This modelling approach is consistent with the idea that the decisions to move and to adjust housing consumption are made simultaneously (Rabe & Taylor 2010). An alternative to this is a sequential modelling approach where the extent and direction of housing consumption is modelled conditional on making a residential move (Ermisch & Jenkins 1999; Whelan *et al.* 2019). This modeling approach could arguably produce a more efficient estimate of the impact of retirement on housing consumption. However, this poses an additional empirical challenge of finding a suitable instrument that influences the propensity to move but not housing consumption. The lack of a such plausible instrument in our data leads us to employ this empirical model.[12]

[11] We are not aware of any FE model that respects the binary nature of the dependent variable and produces consistent estimate of the endogenous variable. We also experimented with employing a Probit model for all binary outcomes. The results, measured in marginal effects and reported in Appendix Table A2, are largely in terms of the statistical significance and magnitude to the estimates obtained from linear regression models and represented in Appendix Table A5. This similarity alleviates a concern that our results may be driven by the linearity assumption.

[12] Some studies apply a subsequent modelling approach to examine housing adjustments in later life (Ermisch & Jenkins 1999; Whelan *et al.* 2019). In particular, they first model the determinants of residential mobility among all considered individuals and the subsequent housing adjustments (as measured by house values) made by those who move. To address the possible endogeneity of geographic movement (or migration), some studies rely on random experiments (Ludwig *et al.* 2001; Chetty *et al.* 2016) or "quasi-random" experiments (Damm 2014; Kondo & Shoji 2019).

## 6. Main results

### *6.1. Contemporaneous effects of retirement on housing choices*

Table 2 reports estimates of the retirement variable from the FE and FE-IV estimator.[13] FE results (reported in odd columns) suggest that, as compared to working individuals, retired counterparts are more likely to change their residential addresses because estimates of retirement on all four variables capturing a residential move are positive and statistically significant at the 1% level. FE results also indicate that individuals are more likely to pay off their mortgage and become outright homeowners when they retire. Furthermore, according to FE estimates, individuals tend to reduce physical housing consumption (as illustrated by a small but statistically significant (at the 1% level) decrease of 0.04 in the number of bedrooms) or financial housing consumption (as represented by a highly statistically significant reduction of $90 per month in rents among renters) upon retirement. We however do not observe any statistically significant association between retirement and (i) the decision to live in a separate house or (ii) home value. Thus, in line with previous Australian studies which use the same data and a RE (Ong *et al.* 2015) or FE model (Whelan *et al.* 2019), our FE results also suggest little evidence of physical or financial downsizing among homeowners.

[Table 2 around here]

Unfortunately, such identification options are not available for us to simultaneously address the endogeneity of retirement and residential mobility in this study.

[13] For comparison purposes, we also report results from "pooled OLS" regressions which do not control for individual fixed effects in equation (1) in Appendix Table A5. This table shows noticeable differences between pooled OLS and FE estimates in terms of the magnitude and statistical significance. For instance, the pooled OLS estimator produces a smaller estimate of retirement on all variables capturing a residential mobility than the FE estimator does. By contrast, the pooled OLS estimator yields a more pronounced estimate (i.e., more negative or more statistically significant) of retirement on housing consumption outcomes such as separate home, number of bedrooms, mortgaged homeownership, home value and monthly rent. Similarly, the results from an IV model which does not control for individual fixed effects are markedly different from the results of a FE-IV model. For example, consistent with the statistics from a Hausman test which indicate that retirement is exogenous in most IV regressions, IV results often point to a statistically insignificant impact of retirements on housing choices. As explained above, we mainly use the FE estimator in this paper as it controls for time-invariant individual unobservable factors that are correlated with both retirement and housing choices. Indeed, unreported F test statistics from a Hausman test confirm that the FE model is preferred to the pooled OLS model in all cases.

FE-IV results, which are reported in even columns of Table 2, represent three key findings. First, the first-stage F-statistic from FE-IV regressions ranges from 49 (as in the regression of monthly rent) to 499 (mortgaged homeowner), suggesting that our instrument is empirically strong (Stock & Yogo 2005).[14] Second, the results from a Hausman test indicate that retirement is endogenous when modelling five out of ten housing outcomes reported in Table 2. In particular, retirement is found endogenous in the estimation equations of residential mobility, inter-LGA mobility, inter-state mobility, number of bedrooms and home value. Third, when the exogeneity of retirement is rejected, the estimates of retirement change remarkably in terms of the magnitude and statistical significance level.[15] For instance, estimates on the three residential mobility variables are at least four times greater in the FE-IV estimator than in the FE estimator. Particularly, FE-IV results indicate that retirement increases the probability of having a residential move by 12 percentage points (pp), as compared to a FE estimate of just about 3 percentage points. The FE-IV estimated retirement impact on residential mobility is quite sizable as it represents 147% of mean residential mobility probability of all individuals in our sample. Likewise, the FE-IV results suggest that individuals are 12 or 6 percentage points more likely to move between local governmental areas or states/territories,

[14] Appendix Table A3 reports full results from the first stage regressions. The estimates of the instrumental variable show that, consistent with that in previous Austrian studies using the same data and similar method (Zhu 2016; Atalay *et al.* 2019b; Nguyen *et al.* 2020), the retirement probability of individuals aged above the pension eligibility age is about 10 percentage points higher than that of individuals just under the PEA threshold. Other results are as expected. For instance, the retirement likelihood of older Australians increases with age but at a declining rate. Furthermore, the probability of leaving the labour force decreases with the number of working age (i.e., aged between 24 and 64 years old) individuals in the household. However, the individual's education levels or local property prices do not seem to explain the decision to retire very well in our data.

[15] Appendix Table A4 which represents full results from second stage regressions suggests several notable findings. First, the residential mobility likelihood (and hence the relocation distance), the number of bedrooms, the outright homeowner probability, or self-reported home value increases with the respondent's age but at a decreasing rate. Second, as compared to single individuals, those in a marital relationship are slightly less likely to move (as represented by a statistically significant and negative estimate of the married/de facto dummy variable on the relocation distance) but more likely to (i) live in bigger homes or (ii) be mortgaged homeowners. Third, housing choices are highly associated with the number of household members, but the direction of the association varies by housing outcomes and age groups of household members. In particular, the residential mobility probability decreases with the number of household members and this association tends to be driven by the number of older members in the household. By contrast, the likelihood of living in a separate house is positively correlated with the number of older household members. Fourth, an increase in local property prices decreases (i) the probability of living in a separate home, (ii) the number of bedrooms, and (iii) the likelihood of being a mortgaged homeowner. By contrast, increasing local property price is found to raise the home values reported by homeowners or rent amount paid by renters. However, we do not observe any significant association between local property price and the individual's residential mobility likelihood. Likewise, there is little evidence that education levels meaningfully explain the housing choices in our data.

respectively, upon retirement. Similarly, the FE-IV results show a much more visible evidence of physical housing downsizing upon retirement as retirement now leads to a reduction of 0.27 bedrooms.

Table 2 additionally reveals that employing a FE-IV estimator turns the estimate of retirement on home value from statistically insignificant to marginally statistically significant at the 10% level. Thus, the FE-IV estimates indicate that homeowners report that their homes decrease in value by about $80,000 upon retirement, a result which is in line with the idea that retirement leads to financial housing downsizing among homeowners. While the FE-IV result offers no evidence of financial housing downsizing among renters, the FE estimate, which is preferred according to the result from a Hausman test, suggests that the renters pay $90 per month less in rents when they retire.[16] Taken together, the preferred results suggest evidence of financial housing downsizing upon retirement and this pattern holds for both homeowners and renters.

The results from Table 2 also show that while the FE-IV estimator tends to produce a more pronounced impact of retirement on remaining outcomes such as relocation distance, separate house, outright homeowner and mortgaged homeowner, the results from a Hausman test indicate that the exogeneity of retirement cannot be rejected when modelling these outcomes.[17] Thus, as discussed above, the preferred FE results show that retirement leads to (i) a statistically significant increase in relocation distance by 12 km, (ii) a statistically insignificant change in the dwelling type, (iii) a statistically significant increase in the probability of owning a home outright by 6 percentage points, and (iv) a statistically significant decrease in the likelihood of being a mortgaged homeowner by 5 percentage points.

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[16] We only observe a small number of renters in our data and this may limit the statistical power of the empirical models. Therefore, the results on monthly rent for renters should be interpreted with caution.

[17] The p-value from a Hausman test for the endogeneity of retirement in the outright homeowner equation is 0.11 so using the FE result would provide a conservative estimate of the true impact of retirement on the probability of owning a home outright.

In summary, the preferred results from the above analysis show that retirement substantially increases the likelihood of making a residential move as well as the probability of becoming outright homeowners. They also convey that individuals downsize both physically and financially upon retirement. Furthermore, the results suggest that failing to fully account for the endogeneity of retirement often under-estimates the impact of retirement on such housing arrangements.

### *6.2. Intertemporal impact of retirement on housing choices*

Individuals may make a housing decision even before they retire, mainly because housing wealth is an important but typically considered as an illiquid asset which requires individuals to plan in advance (Yates & Bradbury 2010; Guren *et al.* 2020). Similarly, as an illiquid asset, it may take time for their housing plans to be realized and thus to observe a visible impact of retirement on housing choices. To investigate the potential intertemporal impact of retirement on housing choices we utilize the panel structure of the data and follow previous studies (Heller-Sahlgren 2017; Kuusi *et al.* 2020; Nguyen *et al.* 2020) to separately introduce leaded and lagged values of variables describing housing choices in equation (1) where retirement is measured in the current period.

[Figure 1 around here]

Figure 1 reports the impact of retirement on housing arrangements measured up to 7 years around the time of retirement.[18] From Figure 1, we can see that the residential mobility starts approximately 4 years before retirement and peaks at year 2 prior to retirement. The results from two detailed geographical mobility variables show that the peak in residential mobility is mainly driven by intra-LGA mobility because, for other more geographically distant relocations such as inter-LGA mobility or inter-state mobility, the maximum is only observed at the time of retirement. The finding that individuals are most likely to make a more geographically distant relocation at the time of

[18] Consistent with the results from the contemporaneous FE-IV model presented in Table 2, test statistics from a Hausman test indicate that retirement is also exogenous in the intertemporal FE-IV model of three housing outcomes: relocation distance, separate house and monthly rent. We therefore present FE results for these three outcomes. Detailed regression results from these intertemporal models are reported in Appendix Table A6. We also experimented with longer leaded/lagged values of housing outcomes but found the estimates statistically insignificant.

retirement, not earlier, is in line with the results of the intertemporal impact of retirement on relocation distance which also reaches its peak at the retirement year. This finding is also consistent with the idea that working individuals are constrained by work location when making a residential decision (Patrick Bayer *et al.* 2008; Knox & Pinch 2014) and retirement may relax this constraint, allowing them to move farther upon retirement. Figure 1 additionally shows that older Australians are much less likely to change residential location from year 1 to year 4 after retirement. In particular, the probability to relocate, mainly within and between local government areas, is negative and statistically significant during these years. Consistent with this pattern, we also observe a statistically significant drop in relocation distance in years 3, 4, and 5 beyond retirement.

In line with the evidence that older Australians are most likely to make a residential move at year 2 prior to retirement, Figure 1 furthermore suggests that the evidence of physical downsizing in housing consumption, as represented by a statistically significant decrease in the number of bedrooms, peaks at the same time. We additionally observe from Figure 1 that individuals start increasing to pay off mortgages and hence become outright homeowners from year 6 before they retire and the rate of obtaining outright homeownership peaks at year 4 prior to retirement. However, we do not observe any statistically significant change in the home ownership pattern beyond retirement.

Other results from Figure 1 provide suggestive evidence of financial housing downsizing beyond retirement for both homeowners and renters. In particular, the results show retirement leads to a statistically significant reduction in home values (for homeowners) and rents (for renters) within the first 2 years into retirement. For renters, we also observe evidence of financial housing downsizing from year 2 before they retire, a finding which is in line with an oft documented pattern that older workers in our sample and elsewhere retire gradually (OECD 2019). Furthermore, while the evidence of financial housing downsizing is most apparent in year 1 into retirement for homeowners, it is most visible at the time of retirement for renters. Finally, the results suggest some statistically significant impact of retirement on dwelling types, with an opposite pattern around the time of retirement. Specifically, while the probability of residing in a separate house increases in years 3 and 4 before retirement, it decreases slightly (i.e., the estimates are statistically significant at the 10% level only) in years 1 and 2 post retirement.

## 7. Robustness checks

In this section, we check whether our main findings are sensitive to: (i) sample attrition issues, (ii) various definitions of retirement (iii) different functional forms for the age trend, and (iv) inclusion of additional time-variant variables.

To start with, we address a concern that sample attrition may affect our results in three ways. First, we employ an individual FE model, which controls for time-invariant characteristics that may simultaneously influence the respondents' possibility of remaining in the panel and their retirement behaviour and housing outcomes. Second, we address a concern relating to our research design that the attrition rate may be markedly different around the PEA cut-off by running a probit regression where the dependent variable takes the value of one if the individual is in our final sample and zero otherwise. In addition to the pension eligibility age cut-off dummy, we control for a continuous age variable in one of three usual forms (i.e., linear, quadratic, or cubic) in this regression. Appendix Table A7 demonstrates that the probability of being attritted in the next wave of HILDA, due to either all reasons, out-of-scope, or mortality, of individuals aged between 55 and 75 years old in our data is not statistically different around the PEA cut-off. Third, we directly examine whether our sample selection criteria led to sample selection issues by running a probit model on the probability of being included in the final sample. We include basic demographic characteristics, including the retirement variable, in this model. A specific concern regarding our empirical strategy is that retirement may influence the probability that an individual is included in the final sample. The $p$ value from a $t$ test for statistical significance of the retirement variable included in the regression is

0.15 (full results are reported in Appendix Table A8). Overall, the results from these tests alleviate a concern that sample attrition may drive our findings.

We then subject our FE-IV model to three other definitions of retirement status. In particular, we redefine retired individuals as those who reported that they retired completely from the labour force at the survey time (results are reported in Panel B1 of Appendix Table A9). Moreover, we assign about 1% of individuals who were not in the labour force (i.e., our baseline retired individuals) but wanted to work as non-retired individuals (Panel B). The results from these experiments are broadly similar to the baseline results which are re-reported in Panel A of Appendix Table A9. We additionally employ weekly working hours as another labour supply measure and use it in place of the retirement status in our FE-IV model and find a similar pattern: a decrease in weekly working hours leads to an increased likelihood of residential mobility as well as downsizing physically or financially.

The third set of robustness checks involves the use of different functional forms for the age trend. These robustness checks are important because our identification strategy relies on an age-related instrument and hence it may depend on the functional form employed to control for the housing - ageing process. In the baseline specifications, we employed a quadratic functional form for age and in this section, we experiment using a linear or cubic functional form for age. The results from these exercises, reported in Panels C1 and C2 of Appendix Table A9, show little sensitivity in our findings with respect to the impact of retirement on housing choices. Moreover, the estimates of various functional forms for age trend (reported below the estimates of retirement) indicate that the quadratic specification appears to be most appropriate to capture the housing choices over the age profiles since all estimates of the polynomials in the cubic functional form in age are statistically insignificant.

Finally, we deal with a concern that some unobservable time-variant factors may be correlated with both the instrument and housing choices by additionally controlling for some important time-variant variables (Angrist & Pischke 2008). In particular, we mitigate the concern that retirement may affect the individual's health (Nishimura *et al.* 2018) by separately including one of three variables capturing their health, namely general physical health, general mental health, and whether the individual had any disability condition. Likewise, we address a threat that retirement may change the individual's financial situation or life satisfaction (Nguyen *et al.* 2020) by further controlling for non-wage income or overall life satisfaction in the FE-IV regression. The results from these experiments, reported in Panels D1 to D5 in Appendix Table A9, show our findings are robust to the inclusion of these time-variant variables in the regressions.

## 8. Heterogeneity and additional results

### *8.1. Heterogenous retirement impact*

To advance our understanding of the impact of retirement on housing choices, we explore the potential heterogeneity of the retirement impact by estimating a FE-IV or FE model for two sub-populations, separated by each of six individual socio-economic characteristics. They are gender (i.e., male versus female), marital status (married/de facto versus single/separated/divorced/widowed), education levels (with or without a post school qualification), homeownership status (purchasers/renters versus outright homeowners) income groups (low income versus high income, defined relative to the median of income for the whole population), and asset levels (low asset compared to high asset, identified respective to the median of household asset).[19] For each of the time-variant variables, to alleviate the concern that the individuals' retirement and housing condition may influence the way that we assign them to each sub-population, sub-populations are classified using the value identified at its first appearance in the sample. For this sub-population analysis, we initially employ a FE-IV model for all housing outcomes and report the results from this model if the exogeneity of retirement is rejected (i.e., when the $p$ value of the

[19] Information on household asset is only available in waves 2, 6, 10, 14 and 18 of HILDA.

Hausman test for exogeneity is greater than 0.1).[20] When the exogeneity of retirement is not rejected, we report results from a FE model.

[Figure 2 around here]

Figure 2 depicts the retirement impact by sub-populations for ten main housing measures. It suggests that retirement appears to have a more pronounced impact for some sub-populations, depending on housing outcomes, because the estimate (in absolute value) is greater or more statistically significant for them. For instance, retirement seems to have a more visible impact on the probability of making a residential move for individuals who are female, single, less educated, purchasers/renters, have lower income, or come from wealthier households because the estimate is usually higher or more statistically significant for them. Furthermore, the retirement effect on dwelling type is more apparent for male, married or lower educated individuals, or individuals from wealthier households because the estimate on the separate house variable is negative and statistically significant for them only. Similarly, heterogenous analysis for the number of bedroom outcome suggests the evidence of physical downsizing appears more visible for individuals who are male, married, lower educated or purchasers/renters, or come from wealthier households because the estimates are statistically significant for them only.

Figure 2 additionally indicates a more pronounced retirement impact on the likelihood of paying off mortgage and hence becoming outright homeowners for those who are single, have no post-school qualification, own their home outright at the beginning of the study period, have higher income, or come from wealthier households because the estimates are greater (in absolute value) and more statistically significant for them. Likewise, and for similar reasoning, the evidence of financial downsizing in home value tends to be more pronounced for homeowners who have no post school

[20] Due to the use of a much smaller sample size, some sub-population analyses substantially lack a statistical power. We use xtivreg2 command developed by Schaffer (2010) in STATA software to estimate FE-IV regressions. Statistics from a Hausman test for the exogeneity of retirement cannot be calculated for some sub-populations, probably due to their small sample size. In such cases, we treat retirement as exogenous. Furthermore, we cannot run a regression on monthly rent outcome for a sub-population of initial outright homeowners due to the small sample size.

qualification, are outright homeowners or have higher income or higher household wealth. Furthermore, the evidence of downsizing in rents is mainly driven by renters who are male, married or have higher income or higher household wealth because the estimates on monthly rent are greater for them.

Taking the statistical differences of retirement estimates by sub-populations into account, Figure 2 suggests that the impact of retirement is statistically significantly different[21] for some combinations of individual/household characteristics and housing outcomes. For instance, estimates on the residential mobility variable are statistically significantly different by gender, marital status, education levels and income groups. Furthermore, the differential retirement impact on the inter-LGA mobility variable is statistically significant by education and baseline income groups. Similarly, sub-population estimations on the inter-state mobility outcome are distinguishably different by education levels, baseline homeownership status and income groups. Figure 2 also indicates that the retirement impact on the number of bedrooms is statistically significantly different between baseline purchasers/renters and outright homeowners. Likewise, the estimates of retirement on the two housing tenure variables are markedly different by initial marital status, homeownership status and income groups. Finally, the estimates on home value by education are also statistically different at the 5% level, suggesting that only homeowners with lower education report a statistically significant reduction in their home value upon retirement.

### *8.2. The impact of partner's retirement*

It is likely that for coupled individuals, housing choices are made at the household level and hence these housing decisions are influenced by not only own retirement but also spousal retirement (Ermisch & Jenkins 1999; Whelan *et al.* 2019) . To test this possibility, we include the potentially endogenous retirement status of the individual's partner in the housing choice equation (1) of

[21] The statistically significant differences (at the 5% level) in the estimates by sub-populations are visually inspected by observing that the 95% confidence intervals do not overlap.

coupled individuals. As has been done with the individual's own retirement and following Müller & Shaikh (2018), we employ the discontinuity in retirement eligibility ages for the individual's partner as an exogenous instrument for the partner's retirement status. We then apply this modified FE-IV model to a sample of coupled individuals in our data and report regression results in Appendix Table A12.[22]

Consistent with an earlier finding that the retirement-induced residential mobility is mainly driven by single individuals, the FE-IV results suggest that the probability of making a shorter geographically distant residential move, as represented by the residential mobility or inter-LGA mobility, of coupled individuals is not affected by their own or partner's retirement. However, for a more geographical distant move, as measured by inter-state residential mobility, the FE results, which are preferred according to the Hausman test statistics, indicate that own and spousal retirement statistically significantly increases the likelihood of making such a residential move. The FE results additionally show the impact of partner's retirement on the probability of making an inter-state residential move is slightly greater than the influence of own retirement. Likewise, the preferred FE estimates on the relocation distance variable represent that both own and spousal retirement increases the relocation distance, and the impact of spousal retirement is slightly more noticeable than the effect of own retirement.

Other preferred FE results reported in odd columns of Appendix Table A12 suggest some statistically significant spill over impact of spousal retirement on coupled individuals' housing choices such as dwelling type, the number of bedrooms and housing tenure. In particular, only spousal retirement (not own retirement) statistically significantly (at the 10% level) reduces the

[22] Appendix Table A11 reports results from the first-stage regressions. The results show that the probability of retiring by coupled individuals increases substantially when each of them crosses their respective Age Pension eligibility ages, a finding which is in line with an oft observed pattern that couples make joint retirement decisions (Blau & Riphahn 1999; Atalay *et al.* 2019a). Furthermore, the impact of the individual's passing the PEA on own retirement probability is at least twice as large as the influence of the partner's passing the PEA. Appendix Table A12 additionally presents, apart from a low first-stage F-statistic of 4.53 observed from the FE-IV regression of monthly rent which is mostly likely driven by the small sample size, the lowest first-stage F-statistic is 35, indicating that our instruments are empirically strong.

probability of living in a free-standing home or the number of bedrooms. Furthermore, partner's retirement increases the likelihood of paying off mortgage and hence becoming outright homeowners and the impact is of the same size as the influence of one's own retirement. Overall, the results from this section provide suggestive evidence, and in line with previous evidence from UK (Ermisch & Jenkins 1999) and Australia (Whelan *et al.* 2019), that housing rearrangements also respond to spousal retirement.

We further explore the potential differential impact of retirement by gender of coupled individuals (i.e., husband or wife) by running the above modified FE-IV model separately for males and females. The results, reported in Table 3,[23] indicate that, within couple households, the wife's retirement mainly drives the relocation mobility decisions and the husband's retirement steers housing downsizing decisions. In particular, the residential mobility probability of the wife only statistically significantly responds to her own retirement while the residential mobility likelihood of the husband is driven by the retirement of his wife only. This gender difference in the impact of retirement on residential mobility of coupled individuals is consistent with an earlier finding that the retirement-induced residential mobility is mainly driven by female partners in heterosexual relationship.

[Table 3 around here]

By contrast, the reduction in the number of bedrooms and monthly rent upon retirement is only responsive to the retirement of the husband. The finding of a more pronounced role of the husband's retirement in determining the arguably financially driven decisions such as housing downsizing is in line with the traditional role of the husband as the breadwinner and the wife as the homemaker within households (Bertrand *et al.* 2015). To our best knowledge, this gender heterogeneity in the

[23] We report results from a FE regression when the exogeneity of retirement is not rejected in the FE-IV regression (full regression results are available upon request). It should be noted that, as have been done in the baseline analysis, we restrict the sample to coupled individuals whose ages are between 55 and 75 years old at any time during the study period. Due to this age restriction, there is no one-to-one match of male and female individuals in these coupled individual samples.

impact of retirement on housing choices of coupled individuals has not been documented in this literature yet. However, we do not observe any distinguishable differences between the impact of the husband' or wife's retirement on housing tenue or home value.

### *8.3. Additional results*

Above we found that retirement considerably increases the probability of making a residential move. However, it remains largely unknown whether such a retirement-induced residential mobility leads into "better" or "worse" neighbourhoods (Rabe & Taylor 2010). In this section, we explore retirement-associated neighbourhood quality adjustments by invoking our above-described FE-IV model to a set of variables capturing the individual's neighbourhood quality perceptions. These subjective measures of quality of neighbourhood are constructed from responses to a question asking respondents: "How common are the following things in your local neighbourhood?".[24] Respondents are asked to choose one point on a 5-point scale from 1 "never happens" to 5 "very common". Ten aspects of neighbourhood quality are listed and depending on the aspect of neighbourhood quality, a higher value on this index may refer to a more (or less) desirable characteristic (see Table 4 for details). We augment our analysis by employing an objective indicator called "distance to coast" to proxy neighbourhood quality. This variable measures the spatially shortest distance from the individual's residential postcode centroid to Australia's coastline.[25] As

[24] This question is asked in a self-completed mail-returned questionnaire and is available in every wave from wave 1 to 4 of HILDA and every two waves afterwards. It is important to note that subjective indicators may be prone to measurement errors. Our data show the ten measures of neighbourhood quality perceptions used in this paper are highly statistically correlated (at the 1% level) with one another (See Appendix Table A13). Furthermore, each of these measures is statistically significantly (at the 1% level) associated with another objective indicator describing external condition of the respondent's dwelling reported by the interviewer (See Appendix Table A13). Unfortunately, we cannot employ this indicator as an additional measure for neighbourhood quality because the question about external condition of dwelling is only asked in the first 5 waves of HILDA. As discussed in Section 5, our modelling approach assumes that individuals decide whether to move and where to move to (e.g., to a better neighbourhood in this case) simultaneously. To alleviate a concern that retirement may induce changes in mental wellbeing and neighbourhood quality perceptions independent of a residential move (Nguyen *et al.* 2020), as has been done in Section 7, we separately include each of two variables capturing the individual's mental health or life satisfaction condition as an additional control variable in the FE-IV regressions and found the results largely unchanged.

[25] We use the restricted version of HILDA which contains postcode of residence for each survey wave. Postcodes are the finest geographical identifiers available in HILDA. Like UK postcodes or US ZIP codes, Australian postcodes are used by Australia Post to assist with mail delivery. According to the 2011 Census in Australia, there were about 8,500 persons per postcode (among around 2,500 postcodes). Distances to the coast were calculated using the QGIS 3.16.3 graphical information system. Australia's coastline was defined by a spatial point layer with 100 m resolution that was

demonstrated in Appendix Table A13, residential areas with a higher value of this measure (i.e., farther from coast) may entail fewer amenities.

[Table 4 around here]

Results from this experiment, reported in even columns of Table 4, reveal three key findings. First, FE-IV results, which are preferred in 8 out of 11 cases, indicate that older Australians report statistically significant and sizable improvements in the neighbourhood quality upon retirement. Specifically, they report a much higher frequency in two arguably more desirable neighbourhood quality dimensions, namely "neighbourhoods helping each other out" and "neighbourhoods doing things together". On the contrary, they record a much lower prevalence in some of the less desirable neighbourhood characteristics, including "homes and gardens in bad condition", "rubbish and litter lying around", "teenagers hanging around on the streets", "people being hostile and aggressive", "vandalism and deliberate damage to property", and "burglary and theft". These results when observed with an earlier finding of a retirement-induced residential mobility suggest that individuals tend to move to better neighbourhoods upon retirement. Second, the preferred FE estimates on the distance to coast variable indicate that, when individuals retire, they move closer to coastal areas which may offer greater amenities. Third, contrasting the FE-IV results with FE results, which are represented in odd columns of Table 4, indicates that failing to adequately address the endogeneity

provided by Geoscience Australia. The Coordinate Reference System WGS 1984 was used to project the coastline and postcode centroids. Appendix Table A13 shows that our constructed distance to coast variable is highly statistically associated, although with a quite small magnitude, with other self-reported measures of neighbourhood quality perceptions. In particular, it is positively correlated with more desirable characteristics, including neighbours helping each other out and neighbourhoods doing things together. By contrast, it is negatively correlated with less desirable characteristics such as traffic noise, noise from airplanes, trains or industry, or burglary and theft. Consistent with these patterns, unreported results show a negative and high correlation between distance to coast variable and home values as reported in HILDA, with the correlation magnitude of -0.18 and the statistical significance level of less than 1%, indicating a greater value for properties closer to the coast. These correlations are consistent with the styled facts that about two thirds of Australians live in eight state/territory capital cities and all of them, except for Canberra, are located on the coast (Coffee *et al.* 2016). Furthermore, these correlations suggest that while areas closer to the coast offer greater amenities, they may not provide some of the neighbourhood quality characteristics which are typically considered as more desirable. It should be noted that our spatial mapping approach assigns the same distance to coast for individuals who moved within postcodes between survey waves and, by construction, the distance to coast variable does not detect the differences in neighbourhood quality among properties within the same postcode.

of retirement could typically under-estimate such retirement-associated neighbourhood quality perceptions.

## 9. Conclusion

In this paper, we explore the causal impact of retirement on housing choices among older Australians. We present consistent evidence suggesting that retirement is a significant trigger of several aspects of housing adjustments, including paying off mortgage, moving to better neighbourhoods or coastal areas, and downsizing. Our findings are starkly different from the current literature that documents a much less pronounced impact of retirement on housing mobility or an insignificant impact on housing downsizing. The differences between our findings and the previous literature may be driven by our attempts to address the endogeneity of retirement by employing a novel fixed effects instrumental variables model. Equipped with this model and high-quality data, we also present much richer insight into the intertemporal and heterogeneous impact of retirement on housing choices of older individuals. For instance, we find that some housing adjustments are made well beyond the time of retirement, although at different paces. For instance, while home ownership adjustment starts at year 6 before retirement and peaks at year 4 before retirement, residential mobility begins at year 4 prior to retirement, reaches its maximum at year 2 prior to retirement and fades afterwards. Furthermore, while older Australians do not change homeownership status after they retire, they are less likely to relocate post retirement.

Our results show substantial differences in the retirement impact on housing choices among various sub-populations. For instance, retirement has a more pronounced impact on the residential mobility probability of individuals who are female, single, less educated, or have lower income. Moreover, the evidence of physical housing downsizing is more visible for individuals who are married, less educated, purchasers/renters or come from wealthier households. We additionally find evidence suggesting that housing choices are made at the household level since some housing adjustments are driven by both own and spousal retirement. Further analysis reveals new evidence representing that, within couple households, residential mobility choices are primarily influenced by the wife's retirement while housing downsizing decisions are only affected by the husband's retirement.

Our findings of the substantial and heterogeneous impact of retirement on housing choices have some potentially important methodological and policy implications. For example, our results highlight the need to adequately account for the endogeneity of retirement as failing to do so would under-state the impact of retirement. From a policy perspective, our findings suggest that policies to increase retirement ages would also postpone the retirement attributable housing adjustments among older people. The evidence of the substantial housing mobility and downsizing around retirement may be useful input to housing or fiscal policies as it demonstrates that the unleashing of accumulated housing equity occurs well before some major life course events identified in the current literature. In particular, existing literature shows that releasing of housing wealth is typically observed at later stages of the individuals' lives such as moving to nursing homes or death (Whelan *et al.* 2019). Furthermore, the heterogenous retirement impact on housing choices identified in this paper indicates that such policies may have differential effects for individuals with varying socio-economic backgrounds.

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Table 1: Sample means of key covariates and outcomes by retirement status

| | Retired (1) | Not retired (2) | Retired - Not retired (1)-(2) |
|---|---|---|---|
| Male | 0.437 | 0.566 | -0.128*** |
| Age (years) | 66.288 | 60.804 | 5.484*** |
| Married/De facto | 0.724 | 0.769 | -0.045*** |
| Separated/divorced/widowed | 0.227 | 0.185 | 0.042*** |
| Aboriginal | 0.012 | 0.011 | 0.001 |
| Non-English-Speaking migrant | 0.195 | 0.158 | 0.037*** |
| English-Speaking migrant | 0.142 | 0.136 | 0.007* |
| Year 12 | 0.087 | 0.100 | -0.012*** |
| Vocational and training qualification | 0.334 | 0.424 | -0.09*** |
| Bachelor or higher degree | 0.094 | 0.188 | -0.094*** |
| Number of other HH members aged 0-4 | 0.014 | 0.016 | -0.002 |
| Number of other HH members aged 5-9 | 0.016 | 0.024 | -0.008*** |
| Number of other HH members aged 10-14 | 0.023 | 0.043 | -0.02*** |
| Number of other HH members aged 15-23 | 0.072 | 0.234 | -0.161*** |
| Number of other HH members aged 24-64 | 0.409 | 0.759 | -0.35*** |
| Number of other HH members aged >=65 | 0.503 | 0.228 | 0.276*** |
| Local property price ($ mil) | 0.752 | 0.863 | -0.111*** |
| Residential mobility | 0.073 | 0.075 | -0.002 |
| Inter-LGA mobility | 0.039 | 0.035 | 0.004** |
| Inter-state mobility | 0.008 | 0.006 | 0.002** |
| Relocation distance (km) | 13.743 | 10.923 | 2.82* |
| Separate house | 0.821 | 0.851 | -0.03*** |
| Number of bedrooms | 3.167 | 3.397 | -0.229*** |
| Outright homeowner | 0.715 | 0.525 | 0.19*** |
| Mortgaged homeowner | 0.107 | 0.324 | -0.216*** |
| Home value ($100,000) | 5.386 | 6.494 | -1.107*** |
| Monthly rent ($100) | 8.131 | 12.610 | -4.479*** |
| Number of observations | 36,984 | 29,510 | |

Notes: Figures are sample means. Summary statistics are obtained for a regression sample of the number of bedroom outcome. Tests are performed on the significance of the difference between the sample mean for retired and not-retired individuals. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Table 2: Impact of retirement on housing choices - results from FE and FE-IV models

| | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | |
| Retired | 2.83*** | 11.52** | 2.62*** | 11.81*** | 0.92*** | 5.65*** | 11.71*** | 32.41 | -0.68 | -1.96 |
| | [0.47] | [4.61] | [0.36] | [3.55] | [0.21] | [1.84] | [2.35] | [23.57] | [0.49] | [4.95] |
| Observations | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 61,924 | 61,924 | 63,712 | 63,712 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,633 | 7,633 | 7,633 | 7,490 | 7,490 | 7,705 | 7,705 |
| Mean of dep. variable | 7.86 | 7.86 | 4.38 | 4.38 | 1.47 | 1.47 | 12.31 | 12.31 | 84.12 | 84.12 |
| F-statistic of IV | | 474.71 | | 474.71 | | 474.71 | | 480.90 | | 482.71 |
| Hausman test (p-value) | | 0.06 | | 0.01 | | 0.01 | | 0.38 | | 0.79 |
| | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
| Retired | -0.04*** | -0.27** | 5.92*** | 15.37** | -5.23*** | -11.03* | -0.03 | -0.80* | -0.90*** | -3.08 |
| | [0.01] | [0.12] | [0.68] | [6.08] | [0.64] | [5.68] | [0.05] | [0.45] | [0.17] | [2.15] |
| Observations | 66,494 | 66,494 | 66,518 | 66,518 | 66,518 | 66,518 | 53,579 | 53,579 | 9,201 | 9,201 |
| Individuals | 7,933 | 7,933 | 7,934 | 7,934 | 7,934 | 7,934 | 6,645 | 6,645 | 1,500 | 1,500 |
| Mean of dep. variable | 84.12 | 3.24 | 3.24 | 62.91 | 62.91 | 20.01 | 20.01 | 5.71 | 5.71 | 9.30 |
| F-statistic of IV | | 496.54 | | 499.05 | | 499.05 | | 402.01 | | 49.02 |
| Hausman test (p-value) | | 0.05 | | 0.11 | | 0.30 | | 0.09 | | 0.29 |

Notes: FE results are from the regression (1) while FE-IV results from models (1) and (2). F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instrument in the first-stage regression. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variable. Coefficient estimates, standard errors and mean for all binary dependent variables (i.e., except number of bedrooms and house price variables) are multiplied by 100 for aesthetic purposes. Other explanatory variables include the individual characteristics (age and age squared, completed qualifications, marital status), household characteristics (number of household members at various age groups), local property prices, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Table 3: Impact of own and spousal retirement on housing choice of coupled individuals - Heterogeneity by gender

| | Female | Male | Female | Male | Female | Male | Female | Male | Female | Male |
|---|---|---|---|---|---|---|---|---|---|---|
| Housing outcome | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Own retirement | 33.76** | -14.14 | 29.97** | -8.86 | 0.83** | 0.54 | 14.65*** | 1.15 | 0.05 | -1.18* |
| | [16.84] | [12.47] | [13.73] | [9.58] | [0.39] | [0.34] | [4.69] | [4.02] | [0.81] | [0.68] |
| Spousal retirement | -0.73 | 41.81** | -4.28 | 30.89** | 0.85*** | 1.22*** | 3.24 | 15.19*** | -1.02 | -0.98 |
| | [14.17] | [19.96] | [10.98] | [15.45] | [0.33] | [0.38] | [4.44] | [5.25] | [0.73] | [0.70] |
| Observations | 20,035 | 22,333 | 20,035 | 22,333 | 20,035 | 22,333 | 19,847 | 22,087 | 20,354 | 22,669 |
| Individuals | 2,518 | 2,780 | 2,518 | 2,780 | 2,518 | 2,780 | 2,495 | 2,745 | 2,552 | 2,810 |
| Mean of dep. variable | 6.58 | 6.91 | 3.74 | 3.82 | 1.22 | 1.32 | 11.29 | 12.32 | 89.65 | 90.22 |
| F-statistic of IV | 17.61 | 14.42 | 17.61 | 14.42 | | | | | | |
| Hausman test (p-value) | 0.07 | 0.04 | 0.04 | 0.04 | | | | | | |
| Housing outcome | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
| Own retirement | 0.01 | -0.05** | 3.96*** | 4.00*** | -3.04*** | -3.77*** | 0.11 | -0.11 | -0.56 | -1.56*** |
| | [0.03] | [0.02] | [1.20] | [1.04] | [1.14] | [1.00] | [0.09] | [0.07] | [0.45] | [0.37] |
| Spousal retirement | -0.04** | -0.01 | 3.64*** | 3.33*** | -4.25*** | -3.84*** | -0.07 | 0.13 | -0.71** | 0.25 |
| | [0.02] | [0.02] | [1.11] | [1.11] | [1.02] | [1.09] | [0.08] | [0.08] | [0.34] | [0.39] |
| Observations | 21,269 | 23,713 | 21,272 | 23,716 | 21,272 | 23,716 | 18,743 | 20,661 | 1,580 | 2,048 |
| Individuals | 2,640 | 2,901 | 2,640 | 2,901 | 2,640 | 2,901 | 2,392 | 2,599 | 294 | 358 |
| Mean of dep. variable | 3.38 | 3.43 | 70.92 | 65.06 | 19.15 | 23.91 | 5.94 | 6.00 | 10.41 | 11.17 |

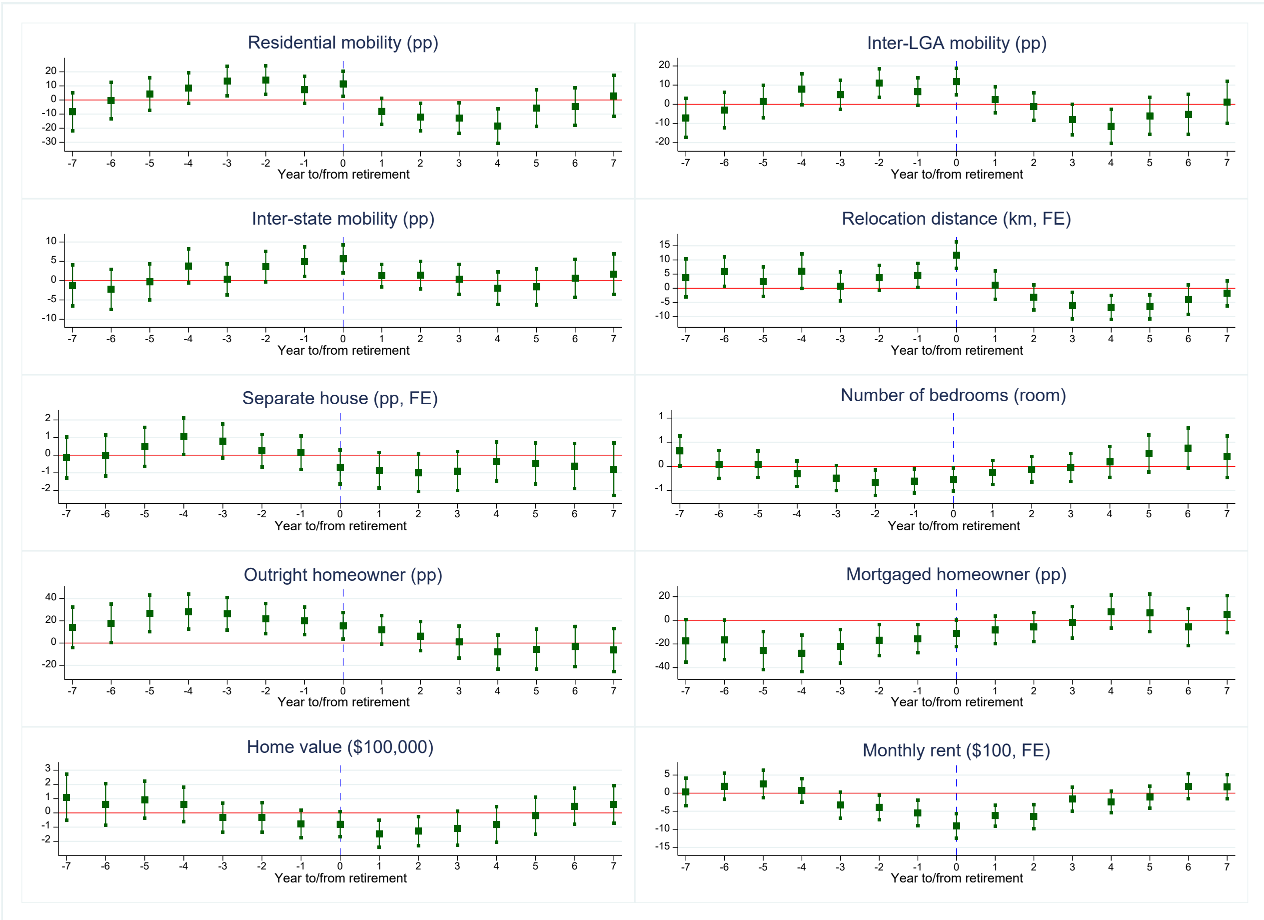
Notes: FE-IV results for residential mobility and inter-LGA mobility outcomes and FE results for other housing outcomes. Instruments: own age >= PEA and partner's age >=PEA. F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instruments in the first-stage regression. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variables. Coefficient estimates, standard errors and mean for all binary dependent variables are multiplied by 100 for aesthetic purposes. Other explanatory variables include characteristics (age and age squared, completed qualifications) of the individual and that of partner, household characteristics (number of household members at various age groups), local property prices, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Table 4: Impact of retirement on neighbourhood quality perceptions - results from FE and FE-IV models

| | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | Neighbours helping each other out [(a)] | | Neighbours doing things together [(a)] | | Traffic noise [(b)] | | Noise from airplanes, trains or industry [(b)] | | Homes and gardens in bad condition [(b)] | | Rubbish and litter lying around [(b)] | |
| Retired | 0.08*** | 0.55*** | 0.04** | 0.40* | -0.02 | -0.14 | 0.03* | -0.02 | -0.02 | -0.36** | -0.06*** | -0.39** |
| | [0.02] | [0.20] | [0.02] | [0.22] | [0.02] | [0.20] | [0.02] | [0.20] | [0.02] | [0.17] | [0.02] | [0.18] |
| Observations | 31,057 | 31,057 | 30,295 | 30,295 | 33,087 | 33,087 | 33,257 | 33,257 | 32,707 | 32,707 | 33,236 | 33,236 |
| Individuals | 6,319 | 6,319 | 6,264 | 6,264 | 6,567 | 6,567 | 6,572 | 6,572 | 6,509 | 6,509 | 6,570 | 6,570 |
| Mean of dep. variable | 3.72 | 3.72 | 3.02 | 3.02 | 2.83 | 2.83 | 2.42 | 2.42 | 2.57 | 2.57 | 2.35 | 2.35 |
| F-statistic of IV | | 179.55 | | 183.73 | | 197.53 | | 194.87 | | 198.65 | | 199.70 |
| Hausman test (p-value) | | 0.02 | | 0.10 | | 0.58 | | 0.81 | | 0.04 | | 0.05 |
| | Teenagers hanging around on the streets [(b)] | | People being hostile and aggressive [(b)] | | Vandalism and deliberate damage to property [(b)] | | Burglary and theft [(b)] | | Distance to coast (km) | | | |
| Retired | -0.07*** | -0.44** | -0.04*** | -0.38** | -0.06*** | -0.55*** | -0.06*** | -0.40** | -1.94*** | 2.60 | | |
| | [0.02] | [0.19] | [0.02] | [0.18] | [0.02] | [0.19] | [0.02] | [0.18] | [0.56] | [4.21] | | |
| Observations | 32,856 | 32,856 | 32,593 | 32,593 | 32,706 | 32,706 | 31,215 | 31,215 | 66,548 | 66,548 | | |
| Individuals | 6,531 | 6,531 | 6,501 | 6,501 | 6,510 | 6,510 | 6,345 | 6,345 | 7,936 | 7,936 | | |
| Mean of dep. variable | 2.33 | 2.33 | 1.99 | 1.99 | 2.27 | 2.27 | 2.46 | 2.46 | 36.01 | 36.01 | | |
| F-statistic of IV | | 196.45 | | 196.81 | | 194.39 | | 187.11 | | 495.62 | | |
| Hausman test (p-value) | | 0.05 | | 0.05 | | 0.01 | | 0.05 | | 0.26 | | |

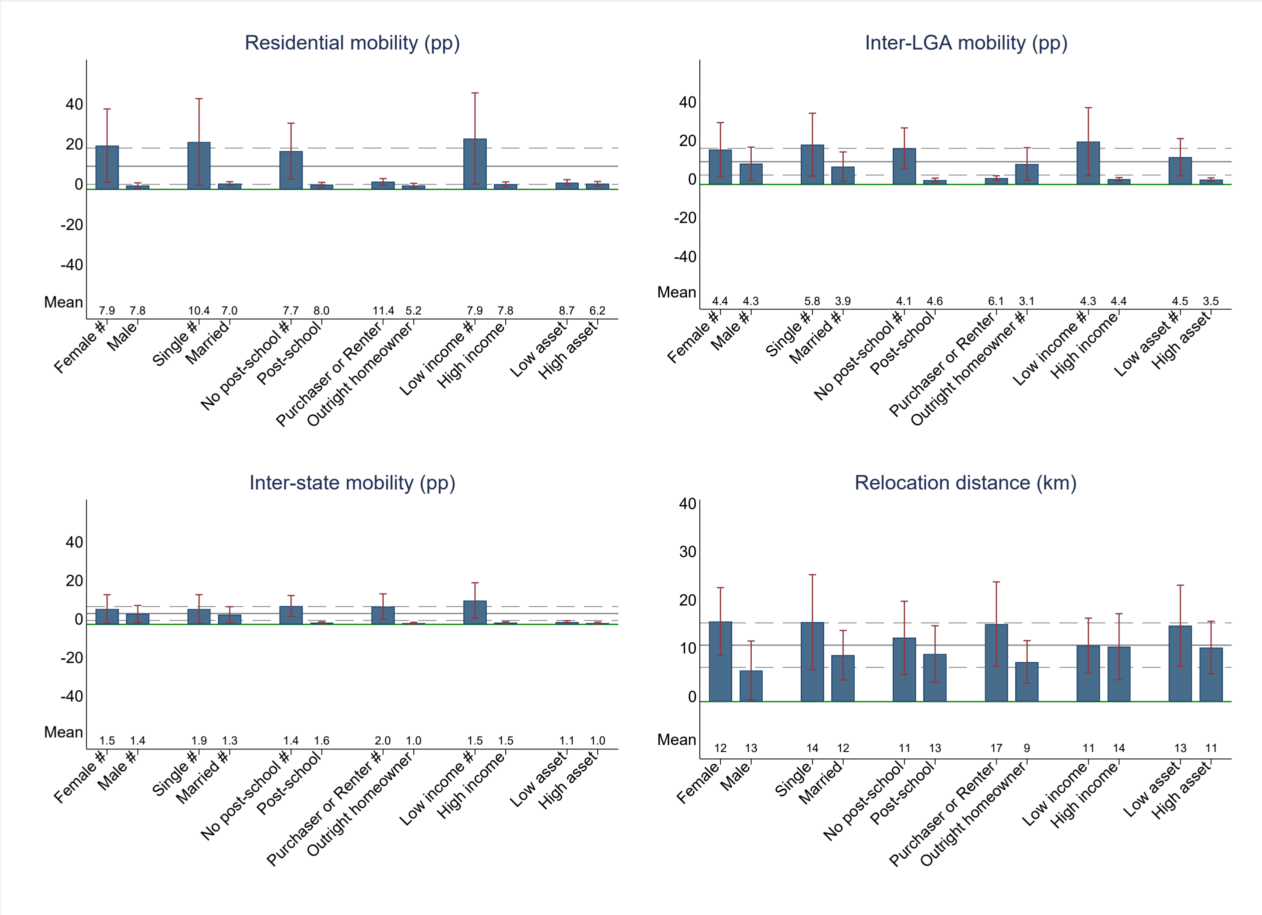
Notes: FE results are from the regression (1) while FE-IV results from models (1) and (2). All dependent variables, except the distance to coast, are measured on a 1-5 scale. For variables superscripted with [(a)], a higher value indicates a more desirable characteristic while the opposite is true for variables superscripted with [(b)]. F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instrument in the first-stage regression. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variable. Other explanatory variables include the individual characteristics (age and age squared, completed qualifications, marital status), household characteristics (number of household members at various age groups), local property prices, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Figure 1: Intertemporal impact of retirement on housing choices



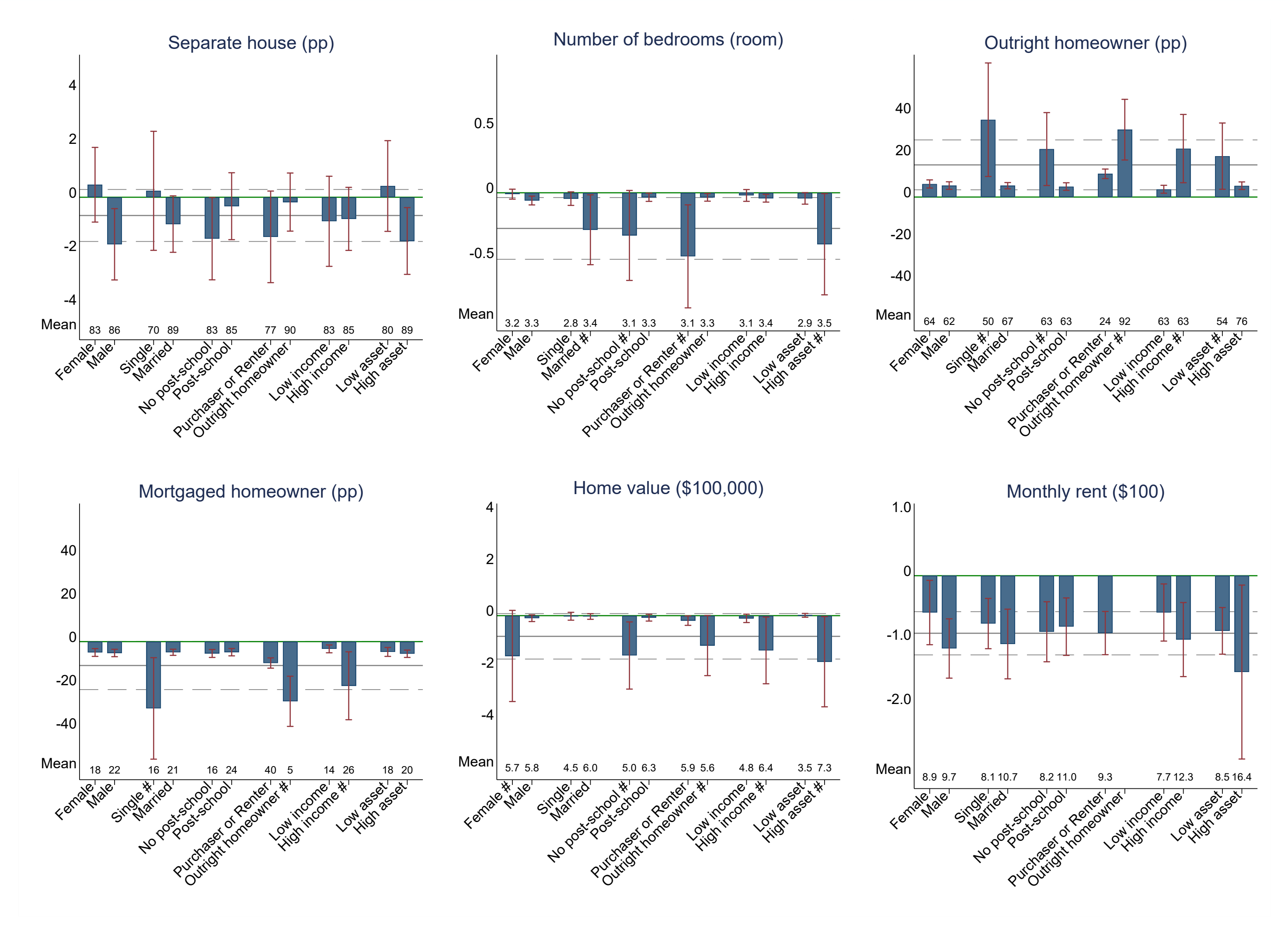

Notes: This figure shows estimate of retirement impact on various housing outcomes in the years before (negative values on the horizontal axis) and after (positive values) retirement. Results for each year and each outcome are from a separate regression. FE regressions are used for relocation distance, separate house and monthly rent outcomes while FE-IV regressions for remaining outcomes. For all binary outcome variables, coefficient estimate and its 95% confidence interval are multiplied by 100 for aesthetic purposes. "pp" denotes percentage points. Detailed regression results are reported in Appendix Table A6.

Figure 2: Heterogenous impact of retirement on housing choices




Notes: Results for different sub-populations are obtained from separate regressions. FE-IV regressions are used for sub-populations and outcomes where the exogeneity of retirement is rejected (these sub-population and outcome combinations are denoted by "#" in the sub-population labels) and FE regressions for remaining sub-populations and outcomes. For all binary outcome variables, sample mean, coefficient estimate and its 95% confidence interval are multiplied by 100 for aesthetic purposes. The solid (dash) horizontal line shows the retirement coefficient (95% confidence interval) estimates for the whole population. "pp" denotes percentage points. The sample mean of dependent variable for each sub-population are printed below the bars. Detailed regression results are reported in Appendix Table A10.

Figure 2: Heterogenous impact of retirement on housing choices (continued)



# Online Appendix

Appendix Table A1: Variable description and summary statistics

| Variable | Description | Mean | Min | Max | Standard deviations | | |
|---|---|---|---|---|---|---|---|
| | | | | | Overall | Between | Within |
| Retired | Dummy variable: = 1 if not in the labour force at the survey time and zero otherwise | 0.56 | 0.00 | 1.00 | 0.50 | 0.43 | 0.29 |
| Residential mobility | Dummy variable: = 1 if move address since last survey wave and zero otherwise | 0.08 | 0.00 | 1.00 | 0.27 | 0.16 | 0.24 |
| Inter-LGA mobility | Dummy variable: = 1 if move address between Local Government Area (LGA) since last survey wave and zero otherwise | 0.04 | 0.00 | 1.00 | 0.20 | 0.12 | 0.18 |
| Inter-state mobility | Dummy variable: = 1 if move address between states/territories since last survey wave and zero otherwise | 0.01 | 0.00 | 1.00 | 0.12 | 0.09 | 0.11 |
| Relocation distance | Great circle distance between the previous and current geocoded addresses (km) | 12.28 | 0.00 | 3681.00 | 135.46 | 69.52 | 123.51 |
| Separate house | Dummy variable: = 1 if live in a separate house and zero otherwise | 0.84 | 0.00 | 1.00 | 0.37 | 0.33 | 0.19 |
| Number of bedrooms | Number of bedrooms | 3.24 | 0.00 | 20.00 | 0.96 | 0.87 | 0.48 |
| Outright homeowner | Dummy variable: = 1 if live in outright owned home and zero otherwise | 0.63 | 0.00 | 1.00 | 0.48 | 0.44 | 0.25 |
| Mortgaged homeowner | Dummy variable: = 1 if live in mortgage paying home and zero otherwise | 0.20 | 0.00 | 1.00 | 0.40 | 0.36 | 0.23 |
| Home value ($100,000) | Self-reported house price ($100,000, measured in 2010 price) | 5.70 | 0.01 | 81.86 | 4.55 | 4.30 | 1.79 |
| Monthly rent ($100) | Self-reported monthly rent ($100, measured in 2010 price) | 9.41 | 0.02 | 97.58 | 5.99 | 6.69 | 2.34 |
| Age >= PEA | Dummy variable: = 1 if the respondent's age is equal or greater than the Pension Eligible Age at the survey time and zero otherwise | 0.45 | 0.00 | 1.00 | 0.50 | 0.42 | 0.33 |
| Male | Dummy variable: = 1 if is a male and zero otherwise | 0.47 | 0.00 | 1.00 | 0.50 | 0.50 | 0.00 |
| Age (years) | Age at the survey time (years) | 63.89 | 55.00 | 75.00 | 5.65 | 5.43 | 3.58 |
| Married/De facto | Dummy variable: = 1 if is married or in De factor relationship at the survey time and zero otherwise | 0.72 | 0.00 | 1.00 | 0.45 | 0.43 | 0.15 |
| Separated/divorced/widowed | Dummy variable: = 1 if is separated/divorced/widowed at the survey time and zero otherwise | 0.23 | 0.00 | 1.00 | 0.42 | 0.40 | 0.14 |
| Aboriginal | Dummy variable: = 1 if has an Aboriginal and Torres Strait Islanders origin and zero otherwise | 0.01 | 0.00 | 1.00 | 0.11 | 0.12 | 0.00 |
| Non-English-Speaking migrant | Dummy: = 1 if immigrant from a Non-English-Speaking Background (NESB) country and zero otherwise | 0.15 | 0.00 | 1.00 | 0.35 | 0.36 | 0.00 |
| English-Speaking migrant | Dummy: = 1 if immigrant from an English-Speaking Background (ESB) country and zero otherwise. ESB countries include UK, Ireland, Canada, New Zealand, South Africa and USA. | 0.14 | 0.00 | 1.00 | 0.35 | 0.35 | 0.00 |
| Year 12 | Dummy: = 1 if complete Year 12 and zero otherwise | 0.08 | 0.00 | 1.00 | 0.27 | 0.27 | 0.03 |
| Vocational or Training qualification | Dummy: = 1 if has a vocational or training qualification and zero otherwise | 0.38 | 0.00 | 1.00 | 0.49 | 0.48 | 0.06 |
| Bachelor or higher degree | Dummy: = 1 if has a bachelor degree or higher and zero otherwise | 0.15 | 0.00 | 1.00 | 0.35 | 0.35 | 0.03 |
| Number of other household members aged 0-4 | Number of other household members aged 0-4, excluding self (person) | 0.02 | 0.00 | 4.00 | 0.17 | 0.13 | 0.12 |
| Number of other household members aged 5-9 | Number of other household members aged 5-9, excluding self (person) | 0.02 | 0.00 | 4.00 | 0.18 | 0.16 | 0.13 |
| Number of other household members aged 10-14 | Number of other household members aged 10-14, excluding self (person) | 0.04 | 0.00 | 4.00 | 0.23 | 0.20 | 0.15 |
| Number of other household members aged 15-13 | Number of other household members aged 15-23, excluding self (person) | 0.15 | 0.00 | 6.00 | 0.47 | 0.45 | 0.28 |
| Number of other household members aged 24-64 | Number of other household members aged 24-64, excluding self (person) | 0.54 | 0.00 | 7.00 | 0.69 | 0.63 | 0.42 |
| Number of other household members aged >=65 | Number of other household members aged 65 or over, excluding self (person) | 0.37 | 0.00 | 3.00 | 0.49 | 0.41 | 0.31 |
| Local house price ($ mil) | Yearly mean price of all transactions at postcode level | 0.76 | 0.01 | 16.80 | 0.53 | 0.52 | 0.25 |

Notes: Summary statistics are obtained for a regression sample of the number of bedroom outcome.

Appendix Table A2: Applying a Probit model for binary outcomes

| | Probit | Bi-probit | Probit | Bi-probit | Probit | Bi-probit | Probit | Bi-probit | Probit | Bi-probit |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Outright homeowner | | Mortgaged homeowner | |
| Retired | 1.76*** | -1.53 | 1.58*** | 0.36 | 0.58*** | 0.13 | 8.24*** | 18.03*** | -11.49*** | -9.37*** |
| | [0.31] | [1.51] | [0.22] | [1.12] | [0.12] | [0.30] | [0.91] | [1.93] | [0.71] | [2.16] |
| Observations | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 66,518 | 66,518 | 66,518 | 66,518 |
| Rho | | 0.18 | | 0.06 | | 0.06 | | -0.47 | | 0.19 |
| P Rho | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 |

Notes: "Probit" results are from a Probit regression of equation (1) without controlling for individual FEs. "Bi-probit" results are from a bivariate probit regression of equations (1) and (2) without controlling for individual FEs. Results (coefficient estimates and standard errors) are reported in marginal effects and are multiplied by 100 for aesthetic purposes. "Rho" is the correlation between errors in equations (1) and (2). "P Rho" denotes $p$ value from a Wald test of Rho = 0. Other explanatory variables include the individual characteristics (age and age squared, completed qualifications, marital status), household characteristics (number of household members at various age groups), local property prices, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A3: First-stage regression results

| Variable | First-stage regression results for outcome | | | | | | |
|---|---|---|---|---|---|---|---|
| | Residential mobility | Relocation distance | Separate house | Number of bedrooms | Outright homeowner | Home value | Monthly rent |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Age >= PEA | 10.33*** | 10.44*** | 10.31*** | 10.26*** | 10.28*** | 10.33*** | 8.22*** |
| | [0.81] | [0.81] | [0.80] | [0.78] | [0.78] | [0.86] | [1.94] |
| Age | 3.44 | 4.05 | 4.59 | 4.81*** | 4.80*** | 5.26*** | 2.95 |
| | [3.03] | [3.05] | [2.99] | [1.03] | [1.03] | [1.16] | [2.39] |
| Age squared | -0.02** | -0.02** | -0.02** | -0.02*** | -0.02** | -0.02** | -0.02 |
| | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.02] |
| Married/De facto [(a)] | 3.17 | 2.64 | 4.97 | 6.26 | 5.48 | -0.24 | 9.56 |
| | [4.58] | [4.70] | [4.65] | [4.50] | [4.57] | [6.02] | [7.01] |
| Separated/divorced/widowed [(a)] | 1.69 | 1.03 | 3.72 | 4.74 | 3.98 | -1.64 | 5.09 |
| | [4.76] | [4.88] | [4.83] | [4.67] | [4.74] | [6.19] | [7.70] |
| Year 12 [(b)] | 4.17 | 4.22 | 3.84 | 4.15 | 4.08 | 13.88* | -43.40*** |
| | [8.24] | [8.36] | [8.10] | [7.96] | [7.92] | [8.12] | [13.16] |
| Vocational and Training qualification [(b)] | 4.12 | 3.88 | 3.96 | 5.04 | 5.06 | 8.59 | -1.70 |
| | [5.19] | [5.30] | [5.17] | [5.16] | [5.16] | [6.04] | [7.06] |
| Bachelor or higher degree [(b)] | -6.60 | -7.37 | -7.57 | -4.61 | -4.80 | 3.64 | -35.65** |
| | [8.55] | [8.77] | [8.50] | [8.41] | [8.35] | [8.80] | [16.65] |
| Number of other HH members aged 0-4 | 2.06 | 2.14 | 2.31* | 2.16* | 2.16* | 2.76* | 0.79 |
| | [1.28] | [1.36] | [1.26] | [1.23] | [1.23] | [1.65] | [1.52] |
| Number of other HH members aged 5-9 | 3.34** | 3.85*** | 3.49*** | 3.76*** | 3.76*** | 3.93** | 1.26 |
| | [1.31] | [1.36] | [1.28] | [1.30] | [1.30] | [1.65] | [2.32] |
| Number of other HH members aged 10-14 | 1.91* | 2.09* | 2.02* | 2.26** | 2.26** | 2.10 | 0.85 |
| | [1.08] | [1.10] | [1.07] | [1.06] | [1.06] | [1.31] | [1.72] |
| Number of other HH members aged 15-23 | -0.02 | -0.04 | -0.04 | 0.22 | 0.21 | 0.37 | 0.02 |
| | [0.65] | [0.66] | [0.64] | [0.64] | [0.64] | [0.73] | [1.30] |
| Number of other HH members aged 24-64 | -1.37** | -1.43** | -1.32** | -1.45** | -1.45** | -1.86*** | 0.88 |
| | [0.59] | [0.60] | [0.58] | [0.58] | [0.58] | [0.65] | [1.32] |
| Number of other HH members aged 65 or over | 3.88*** | 3.72*** | 4.00*** | 3.93*** | 3.95*** | 2.69*** | 2.75 |
| | [0.91] | [0.92] | [0.91] | [0.89] | [0.89] | [0.99] | [2.62] |
| Local property price ($ mil) | 1.21 | 1.27 | 1.10 | 1.18 | 1.16 | 1.75 | -3.84 |
| | [0.99] | [0.99] | [0.99] | [0.99] | [0.99] | [1.12] | [2.35] |
| Observations | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,635 | 7,492 | 7,246 | 7,935 | 7,936 | 6,646 | 1,501 |
| R-squared | 0.201 | 0.202 | 0.191 | 0.206 | 0.206 | 0.219 | 0.092 |

Notes: Results are from the first stage of FE-IV regression. [(a)] and [(b)] denotes being single and having year 11 or below qualification as the base group, respectively. Other included variables: local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. Coefficient estimates and standard errors are multiplied by 100 for aesthetic purposes. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A4: Second-stage regression results

| Variable | Residential mobility | Inter-LGA mobility | Inter-state mobility | Relocation distance (km) | Separate house | Number of bedrooms | Outright homeowner | Mortgaged homeowner | Home value ($100,000) | Monthly rent ($100) |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Age | 19.20*** | 17.30*** | 5.44*** | 46.76*** | 3.50 | 0.06*** | 7.12*** | -5.22*** | 0.36*** | 0.28 |
| | [2.63] | [2.09] | [1.20] | [15.89] | [2.21] | [0.02] | [1.00] | [1.00] | [0.08] | [0.25] |
| Age squared | 0.02*** | 0.01*** | 0.01*** | 0.00 | -0.01 | -0.00*** | -0.05*** | 0.03*** | -0.00*** | -0.00 |
| | [0.00] | [0.00] | [0.00] | [0.02] | [0.01] | [0.00] | [0.01] | [0.01] | [0.00] | [0.00] |
| Married/De facto (a) | 0.98 | -4.14 | -2.61 | -22.38* | 3.32 | 0.19** | 5.65 | 7.58* | 1.02 | -0.10 |
| | [4.46] | [4.23] | [2.31] | [12.73] | [3.95] | [0.10] | [5.18] | [4.34] | [0.76] | [0.81] |
| Separated/divorced/widowed (a) | 2.80 | -3.71 | -2.63 | -21.35 | -2.54 | 0.12 | 1.25 | 5.49 | 0.50 | -0.21 |
| | [4.55] | [4.29] | [2.37] | [13.39] | [4.18] | [0.10] | [5.37] | [4.48] | [0.78] | [1.02] |
| Year 12 (b) | 3.01 | -0.44 | -3.24 | -45.71 | 4.54 | 0.11 | -6.27 | 2.97 | -0.71 | 0.80 |
| | [5.11] | [4.13] | [3.21] | [43.78] | [5.64] | [0.15] | [7.33] | [8.70] | [0.49] | [1.73] |
| Vocational and Training qualification (b) | 2.18 | 1.75 | -2.25 | -1.14 | -0.89 | -0.02 | -2.54 | 0.91 | -0.45 | 0.27 |
| | [2.78] | [2.45] | [1.61] | [15.58] | [2.68] | [0.07] | [3.07] | [4.13] | [0.28] | [0.82] |
| Bachelor or higher degree (b) | 2.68 | 2.27 | -1.23 | 55.84 | -1.79 | -0.03 | 5.73 | -11.42 | -0.44 | 2.48* |
| | [4.67] | [4.10] | [3.11] | [38.65] | [3.82] | [0.11] | [7.25] | [7.97] | [0.33] | [1.36] |
| Number of other HH members aged 0-4 | 1.50 | 1.79 | 1.35** | -3.96 | 2.23** | 0.09*** | -1.83 | 1.89 | -0.13* | 0.54* |
| | [1.35] | [1.15] | [0.68] | [4.78] | [1.02] | [0.03] | [1.43] | [1.59] | [0.07] | [0.31] |
| Number of other HH members aged 5-9 | -0.04 | -0.58 | -1.20* | -3.78 | 3.56*** | 0.20*** | -0.31 | 0.63 | -0.05 | 0.55** |
| | [1.24] | [1.09] | [0.65] | [5.94] | [0.98] | [0.03] | [1.34] | [1.49] | [0.07] | [0.25] |
| Number of other HH members aged 10-14 | -2.18*** | -1.18* | 0.39 | -5.14 | 4.19*** | 0.22*** | -2.28* | 2.88** | -0.12 | 0.54** |
| | [0.85] | [0.71] | [0.50] | [3.86] | [0.73] | [0.03] | [1.21] | [1.25] | [0.12] | [0.26] |
| Number of other HH members aged 15-23 | -2.96*** | -2.10*** | -0.55*** | -6.68*** | 3.29*** | 0.17*** | -1.21* | 1.45** | -0.09 | 0.72*** |
| | [0.42] | [0.31] | [0.20] | [1.44] | [0.50] | [0.02] | [0.63] | [0.71] | [0.06] | [0.16] |
| Number of other HH members aged 24-64 | -3.00*** | -1.67*** | -0.41** | -3.23** | 3.33*** | 0.16*** | 0.92 | 1.73*** | 0.05 | 1.14*** |
| | [0.41] | [0.32] | [0.20] | [1.54] | [0.47] | [0.01] | [0.60] | [0.64] | [0.04] | [0.16] |
| Number of other HH members aged >= 65 | -2.82*** | -1.79*** | -0.63** | -2.38 | 4.16*** | 0.20*** | 3.05*** | -0.02 | 0.17** | 1.52*** |
| | [0.62] | [0.48] | [0.30] | [3.17] | [0.74] | [0.02] | [0.96] | [0.93] | [0.07] | [0.25] |
| Local property price ($ mil) | 0.62 | 0.34 | 0.06 | 4.70 | -8.24*** | -0.09*** | 0.01 | -2.97*** | 2.05*** | 2.29* |
| | [0.67] | [0.68] | [0.29] | [4.27] | [1.52] | [0.03] | [1.18] | [1.13] | [0.33] | [1.20] |

Notes: Results are from the second stage of FE-IV regression. (a) and (b) denotes being single and having year 11 or below qualification as the base group, respectively. Other included variables: local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. Coefficient estimates, standard errors for all binary dependent variables (i.e., except number of bedrooms, home value and rent variables) are multiplied by 100 for aesthetic purposes. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A5: Impact of retirement on housing choice - results from POLS and IV models

| | POLS | IV | POLS | IV | POLS | IV | POLS | IV | POLS | IV |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | |
| Retired | 1.83*** | 6.13 | 1.64*** | 7.50** | 0.63*** | 2.19 | 7.69*** | 15.07 | -2.45*** | 5.07 |
| | [0.32] | [4.65] | [0.23] | [3.56] | [0.13] | [1.88] | [1.47] | [25.30] | [0.69] | [7.22] |
| Observations | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 62,746 | 61,924 | 61,924 | 63,712 | 63,712 |
| Mean of dep. variable | 7.86 | 7.86 | 4.38 | 4.38 | 1.47 | 1.47 | 12.31 | 12.31 | 84.12 | 84.12 |
| F-statistic of IV | | 217.35 | | 217.35 | | 217.35 | | 217.34 | | 221.50 |
| Hausman test (p-value) | | 0.35 | | 0.09 | | 0.40 | | 0.77 | | 0.30 |
| | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
| Retired | -0.10*** | -0.18 | 8.46*** | 18.30** | -12.46*** | -8.50 | -0.54*** | -0.83 | -2.25*** | -2.56 |
| | [0.02] | [0.17] | [0.95] | [8.84] | [0.78] | [7.22] | [0.10] | [0.73] | [0.21] | [2.25] |
| Observations | 66,494 | 66,494 | 66,518 | 66,518 | 66,518 | 66,518 | 53,579 | 53,579 | 9,201 | 9,201 |
| Mean of dep. variable | 84.12 | 3.24 | 3.24 | 62.91 | 62.91 | 20.01 | 20.01 | 5.71 | 5.71 | 9.30 |
| F-statistic of IV | | 233.97 | | 234.44 | | 234.44 | | 185.23 | | 41.89 |
| Hausman test (p-value) | | 0.65 | | 0.26 | | 0.58 | | 0.69 | | 0.89 |

Notes: POLS results are from the pooled OLS regression (1) while IV results from pooled regression models (1) and (2), without controlling for individual fixed effects. F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instrument in the first-stage regression. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variable. Coefficient estimates, standard errors and mean for all binary dependent variables (i.e., except number of bedrooms and house price variables) are multiplied by 100 for aesthetic purposes. Other explanatory variables include the individual characteristics (gender, age and age squared, migration status, Indigenous status, completed qualifications, marital status), household characteristics (number of household members at various age groups), local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A6: Intertemporal impact of retirement on housing choices

| | Year since retirement | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Housing choice measure | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Residential mobility** | | | | | | | | | | | | | | | |
| Retired | -8.30 | -0.36 | 4.35 | 8.50 | 13.47** | 14.17*** | 7.29 | 11.52** | -8.07* | -12.08** | -12.82** | -18.40*** | -5.78 | -4.70 | 2.95 |
| | [6.91] | [6.56] | [5.91] | [5.51] | [5.39] | [5.09] | [4.91] | [4.61] | [4.71] | [5.03] | [5.53] | [6.24] | [6.65] | [6.81] | [7.38] |
| Observations | 33,170 | 37,617 | 41,484 | 45,365 | 49,291 | 53,257 | 57,459 | 62,746 | 59,065 | 53,049 | 47,653 | 42,626 | 37,754 | 33,168 | 28,834 |
| Individuals | 4,654 | 5,592 | 5,892 | 6,167 | 6,447 | 6,725 | 7,082 | 7,633 | 7,151 | 6,545 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 8.94 | 8.76 | 8.52 | 8.34 | 8.26 | 8.14 | 8.03 | 8.19 | 6.95 | 6.90 | 6.72 | 6.57 | 6.45 | 6.26 | 6.11 |
| F-statistic of IV | 263.45 | 283.97 | 312.66 | 349.06 | 374.74 | 402.79 | 412.27 | 474.71 | 426.03 | 371.17 | 295.89 | 242.03 | 185.44 | 163.75 | 141.66 |
| Hausman test (p-value) | 0.16 | 0.87 | 0.54 | 0.14 | 0.01 | 0.01 | 0.26 | 0.06 | 0.08 | 0.02 | 0.02 | 0.00 | 0.44 | 0.51 | 0.69 |
| **Inter-LGA mobility** | | | | | | | | | | | | | | | |
| Retired | -7.06 | -3.03 | 1.51 | 7.87* | 5.00 | 11.08*** | 6.56* | 11.81*** | 2.44 | -1.14 | -7.93* | -11.50** | -6.03 | -5.25 | 1.08 |
| | [5.21] | [4.75] | [4.32] | [4.17] | [3.89] | [3.78] | [3.65] | [3.55] | [3.47] | [3.65] | [4.06] | [4.48] | [4.95] | [5.29] | [5.61] |
| Observations | 33,170 | 37,617 | 41,484 | 45,365 | 49,291 | 53,257 | 57,459 | 62,746 | 59,065 | 53,049 | 47,653 | 42,626 | 37,754 | 33,168 | 28,834 |
| Individuals | 4,654 | 5,592 | 5,892 | 6,167 | 6,447 | 6,725 | 7,082 | 7,633 | 7,151 | 6,545 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 4.83 | 4.73 | 4.60 | 4.54 | 4.52 | 4.49 | 4.45 | 4.70 | 3.50 | 3.60 | 3.50 | 3.40 | 3.36 | 3.30 | 3.22 |
| F-statistic of IV | 263.45 | 283.97 | 312.66 | 349.06 | 374.74 | 402.79 | 412.27 | 474.71 | 426.03 | 371.17 | 295.89 | 242.03 | 185.44 | 163.75 | 141.66 |
| Hausman test (p-value) | 0.15 | 0.51 | 0.75 | 0.07 | 0.22 | 0.01 | 0.18 | 0.01 | 0.48 | 0.83 | 0.04 | 0.01 | 0.29 | 0.34 | 0.87 |
| **Inter-state mobility** | | | | | | | | | | | | | | | |
| Retired | -1.23 | -2.24 | -0.31 | 3.81* | 0.35 | 3.61* | 4.92** | 5.65*** | 1.29 | 1.44 | 0.33 | -1.94 | -1.61 | 0.64 | 1.70 |
| | [2.73] | [2.64] | [2.36] | [2.22] | [2.05] | [2.00] | [1.97] | [1.84] | [1.49] | [1.81] | [1.96] | [2.16] | [2.37] | [2.51] | [2.67] |
| Observations | 33,170 | 37,617 | 41,484 | 45,365 | 49,291 | 53,257 | 57,459 | 62,746 | 59,065 | 53,049 | 47,653 | 42,626 | 37,754 | 33,168 | 28,834 |
| Individuals | 4,654 | 5,592 | 5,892 | 6,167 | 6,447 | 6,725 | 7,082 | 7,633 | 7,151 | 6,545 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 1.54 | 1.46 | 1.40 | 1.39 | 1.39 | 1.39 | 1.47 | 1.82 | 0.65 | 0.81 | 0.81 | 0.79 | 0.76 | 0.75 | 0.76 |
| F-statistic of IV | 263.45 | 283.97 | 312.66 | 349.06 | 374.74 | 402.79 | 412.27 | 474.71 | 426.03 | 371.17 | 295.89 | 242.03 | 185.44 | 163.75 | 141.66 |
| Hausman test (p-value) | 0.66 | 0.38 | 0.99 | 0.08 | 0.79 | 0.07 | 0.02 | 0.01 | 0.40 | 0.39 | 0.79 | 0.47 | 0.56 | 0.75 | 0.49 |
| **Relocation distance** | | | | | | | | | | | | | | | |
| Retired | 3.72 | 5.93** | 2.32 | 5.98* | 0.68 | 3.72* | 4.53** | 11.71*** | 1.10 | -3.16 | -6.05** | -6.77*** | -6.49*** | -3.96 | -1.80 |
| | [3.42] | [2.64] | [2.65] | [3.11] | [2.59] | [2.25] | [2.16] | [2.35] | [2.53] | [2.24] | [2.39] | [2.13] | [2.16] | [2.66] | [2.26] |
| Observations | 32,856 | 37,267 | 41,104 | 44,949 | 48,819 | 52,719 | 56,843 | 61,924 | 59,019 | 52,940 | 47,522 | 42,508 | 37,671 | 33,081 | 28,761 |
| Individuals | 4,618 | 5,544 | 5,841 | 6,105 | 6,369 | 6,631 | 6,978 | 7,490 | 7,149 | 6,534 | 6,036 | 5,632 | 5,214 | 4,820 | 4,432 |
| Mean of dep. variable | 15.04 | 14.50 | 13.49 | 13.38 | 13.05 | 12.59 | 12.44 | 12.31 | 11.79 | 11.52 | 11.38 | 10.79 | 10.74 | 10.34 | 10.31 |
| **Separate house** | | | | | | | | | | | | | | | |
| Retired | -0.13 | -0.01 | 0.48 | 1.07** | 0.80* | 0.25 | 0.15 | -0.68 | -0.86* | -1.00* | -0.90 | -0.36 | -0.47 | -0.62 | -0.79 |
| | [0.59] | [0.59] | [0.56] | [0.53] | [0.49] | [0.47] | [0.49] | [0.49] | [0.51] | [0.54] | [0.57] | [0.57] | [0.60] | [0.65] | [0.76] |
| Observations | 34,707 | 38,501 | 42,371 | 46,263 | 50,141 | 54,138 | 58,377 | 63,712 | 59,060 | 53,045 | 47,652 | 42,625 | 37,753 | 33,167 | 28,833 |
| Individuals | 5,424 | 5,695 | 5,969 | 6,237 | 6,490 | 6,786 | 7,154 | 7,705 | 7,151 | 6,544 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 86.93 | 86.55 | 86.14 | 85.77 | 85.40 | 84.98 | 84.57 | 84.12 | 83.85 | 83.43 | 83.00 | 82.53 | 82.06 | 81.63 | 81.06 |

Notes: Results for each column and each housing choice are from a separate regression. FE regressions are used for relocation distance, separate house and monthly rent outcomes while FE-IV regressions for remaining outcomes. Other notes see Table 2.

## Appendix Table A6: Intertemporal impact of retirement on housing choices (continued)

| | Year since retirement | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Housing choice measure | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Number of bedrooms** | | | | | | | | | | | | | | | |
| Retired | 0.32** | 0.04 | 0.04 | -0.15 | -0.24* | -0.34** | -0.30** | -0.27** | -0.13 | -0.06 | -0.02 | 0.09 | 0.27 | 0.38* | 0.20 |
| | [0.16] | [0.15] | [0.14] | [0.14] | [0.13] | [0.13] | [0.13] | [0.12] | [0.13] | [0.14] | [0.15] | [0.16] | [0.19] | [0.21] | [0.22] |
| Observations | 37,326 | 41,160 | 44,981 | 48,837 | 52,679 | 56,742 | 61,053 | 66,494 | 59,025 | 53,019 | 47,630 | 42,603 | 37,737 | 33,151 | 28,819 |
| Individuals | 5,556 | 5,861 | 6,118 | 6,385 | 6,641 | 6,975 | 7,392 | 7,933 | 7,147 | 6,542 | 6,060 | 5,651 | 5,223 | 4,832 | 4,439 |
| Mean of dep. variable | 3.32 | 3.31 | 3.30 | 3.29 | 3.27 | 3.26 | 3.25 | 3.24 | 3.22 | 3.21 | 3.19 | 3.18 | 3.16 | 3.15 | 3.13 |
| F-statistic of IV | 268.28 | 304.27 | 341.08 | 371.90 | 394.17 | 411.21 | 464.49 | 496.54 | 424.20 | 371.32 | 295.25 | 241.92 | 184.77 | 164.10 | 141.45 |
| Hausman test (p-value) | 0.04 | 0.78 | 0.82 | 0.23 | 0.08 | 0.01 | 0.02 | 0.05 | 0.49 | 0.83 | 0.96 | 0.54 | 0.16 | 0.06 | 0.33 |
| **Outright homeowner** | | | | | | | | | | | | | | | |
| Retired | 14.18 | 17.71** | 26.69*** | 28.21*** | 26.40*** | 21.86*** | 20.04*** | 15.37** | 11.86* | 6.28 | 1.03 | -7.94 | -5.55 | -3.05 | -6.21 |
| | [9.30] | [8.76] | [8.45] | [8.03] | [7.45] | [6.90] | [6.41] | [6.08] | [6.47] | [6.73] | [7.35] | [7.84] | [9.16] | [9.24] | [9.80] |
| Observations | 37,338 | 41,176 | 45,000 | 48,856 | 52,702 | 56,773 | 61,082 | 66,518 | 59,065 | 53,049 | 47,653 | 42,626 | 37,754 | 33,168 | 28,834 |
| Individuals | 5,556 | 5,862 | 6,119 | 6,386 | 6,641 | 6,976 | 7,393 | 7,934 | 7,151 | 6,545 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 53.10 | 54.58 | 55.97 | 57.34 | 58.78 | 60.10 | 61.42 | 62.61 | 64.49 | 66.01 | 67.45 | 68.82 | 70.04 | 71.22 | 72.31 |
| F-statistic of IV | 266.95 | 305.22 | 341.98 | 371.87 | 394.86 | 411.84 | 464.70 | 499.05 | 426.03 | 371.17 | 295.89 | 242.03 | 185.44 | 163.75 | 141.66 |
| Hausman test (p-value) | 0.19 | 0.08 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.11 | 0.26 | 0.60 | 0.95 | 0.37 | 0.65 | 0.96 | 0.57 |
| **Mortgaged homeowner** | | | | | | | | | | | | | | | |
| Retired | -17.44* | -16.64* | -25.50*** | -27.80*** | -22.03*** | -16.76** | -15.59** | -11.03* | -8.20 | -5.63 | -1.75 | 7.30 | 6.30 | -5.60 | 5.14 |
| | [9.15] | [8.54] | [8.25] | [7.85] | [7.21] | [6.69] | [6.07] | [5.68] | [5.93] | [6.22] | [6.83] | [7.12] | [8.10] | [8.00] | [8.00] |
| Observations | 37,338 | 41,176 | 45,000 | 48,856 | 52,702 | 56,773 | 61,082 | 66,518 | 59,065 | 53,049 | 47,653 | 42,626 | 37,754 | 33,168 | 28,834 |
| Individuals | 5,556 | 5,862 | 6,119 | 6,386 | 6,641 | 6,976 | 7,393 | 7,934 | 7,151 | 6,545 | 6,060 | 5,654 | 5,223 | 4,832 | 4,440 |
| Mean of dep. variable | 29.61 | 28.22 | 26.92 | 25.64 | 24.26 | 22.89 | 21.54 | 20.11 | 18.73 | 17.34 | 15.98 | 14.58 | 13.33 | 12.11 | 10.98 |
| F-statistic of IV | 266.95 | 305.22 | 341.98 | 371.87 | 394.86 | 411.84 | 464.70 | 499.05 | 426.03 | 371.17 | 295.89 | 242.03 | 185.44 | 163.75 | 141.66 |
| Hausman test (p-value) | 0.08 | 0.10 | 0.00 | 0.00 | 0.01 | 0.04 | 0.06 | 0.30 | 0.45 | 0.57 | 0.82 | 0.41 | 0.55 | 0.33 | 0.61 |
| **Home value ($100.000)** | | | | | | | | | | | | | | | |
| Retired | 1.10 | 0.60 | 0.93 | 0.60 | -0.32 | -0.32 | -0.77 | -0.80* | -1.46*** | -1.28** | -1.08* | -0.82 | -0.19 | 0.46 | 0.60 |
| | [0.83] | [0.74] | [0.67] | [0.61] | [0.52] | [0.53] | [0.49] | [0.45] | [0.49] | [0.52] | [0.61] | [0.64] | [0.67] | [0.65] | [0.68] |
| Observations | 30,010 | 33,200 | 36,297 | 39,458 | 42,622 | 45,901 | 49,328 | 53,579 | 47,876 | 43,146 | 38,801 | 34,679 | 30,729 | 26,964 | 23,369 |
| Individuals | 4,660 | 4,941 | 5,166 | 5,393 | 5,616 | 5,885 | 6,212 | 6,645 | 6,028 | 5,552 | 5,141 | 4,777 | 4,402 | 4,056 | 3,698 |
| Mean of dep. variable | 5.39 | 5.42 | 5.45 | 5.49 | 5.55 | 5.61 | 5.67 | 5.69 | 5.76 | 5.81 | 5.84 | 5.85 | 5.85 | 5.83 | 5.79 |
| F-statistic of IV | 210.41 | 233.36 | 261.91 | 296.13 | 294.22 | 323.32 | 356.68 | 402.01 | 359.98 | 307.29 | 237.65 | 205.29 | 159.66 | 141.20 | 124.69 |
| Hausman test (p-value) | 0.14 | 0.33 | 0.15 | 0.31 | 0.52 | 0.50 | 0.12 | 0.09 | 0.00 | 0.01 | 0.05 | 0.14 | 0.68 | 0.54 | 0.38 |
| **Monthly rent ($100)** | | | | | | | | | | | | | | | |
| Retired | 0.35 | 1.91 | 2.53 | 0.72 | -3.28* | -3.89** | -5.47*** | -9.00*** | -6.20*** | -6.45*** | -1.62 | -2.41 | -1.08 | 1.89 | 1.77 |
| | [1.94] | [1.85] | [1.94] | [1.66] | [1.83] | [1.74] | [1.78] | [1.72] | [1.49] | [1.70] | [1.69] | [1.51] | [1.54] | [1.76] | [1.71] |
| Observations | 5,367 | 5,827 | 6,303 | 6,797 | 7,270 | 7,839 | 8,447 | 9,201 | 7,938 | 6,996 | 6,241 | 5,568 | 4,872 | 4,216 | 3,635 |
| Individuals | 1,036 | 1,085 | 1,141 | 1,199 | 1,240 | 1,316 | 1,408 | 1,500 | 1,295 | 1,140 | 1,039 | 967 | 874 | 786 | 709 |
| Mean of dep. variable | 94.47 | 95.17 | 95.81 | 95.31 | 94.80 | 94.35 | 93.79 | 92.99 | 91.67 | 90.87 | 90.37 | 90.12 | 89.91 | 89.45 | 88.80 |

Appendix Table A7: Attrition rates around pension eligibility age cut-off

| Dependent variable | Attrition due to all reasons | | | Attrition due to out of scope | | | Attrition due to mortality | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Age >= PEA | -0.04 | -0.01 | 0.28 | -0.15 | -0.16 | -0.11 | -0.03 | -0.03 | -0.08 |
| | [0.33] | [0.34] | [0.42] | [0.17] | [0.17] | [0.21] | [0.13] | [0.13] | [0.16] |
| Age | -0.03 | -1.81*** | 8.60 | -0.04*** | -0.20 | 1.55 | 0.06*** | 0.06 | -1.80 |
| | [0.03] | [0.37] | [8.71] | [0.01] | [0.19] | [4.42] | [0.01] | [0.15] | [3.37] |
| Age squared | | 0.01*** | -0.15 | | 0.00 | -0.03 | | 0.00 | 0.03 |
| | | [0.00] | [0.14] | | [0.00] | [0.07] | | [0.00] | [0.05] |
| Age cubed | | | 0.00 | | | 0.00 | | | -0.00 |
| | | | [0.00] | | | [0.00] | | | [0.00] |
| Observations | 63,666 | 63,666 | 63,666 | 63,666 | 63,666 | 63,666 | 63,666 | 63,666 | 63,666 |
| Pseudo R2 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 |
| Mean of dependent variable*100 | 5.03 | 5.03 | 5.03 | 1.18 | 1.18 | 1.18 | 0.70 | 0.70 | 0.70 |

Notes: Results (in marginal effects) are from a probit model. Dummy dependent variables are constructed from a variable describing the final interview status in the next wave of HILDA. “Attrition due to all reasons” dependent variable is equal to one if the individual is not surveyed in the next wave for any reason and zero if the individual is surveyed. “Attrition due to out of scope” dependent variable is a dummy variable taking the value of one if the individual is not surveyed because of being overseas for more than 6 months, in prison, or no longer living with a permanent sample member. “Attrition due to mortality” variable takes the value of one if the individual deceased in the next survey wave and zero otherwise. Sample: individuals aged between 55 and 75 years old. Robust standard errors clustered at the individual level in parentheses. Coefficient estimates and standard errors are multiplied by 100 for aesthetic purposes. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A8: Differences between original and selected samples

| Variables | Estimate (ME) |
|---|---|
| Retired | -0.17 |
| Age | 5.51*** |
| Age squared | -0.04*** |
| Male | -0.26** |
| Married/De facto [(a)] | 1.36*** |
| Separated/divorced/widowed [(a)] | 0.02 |
| Aboriginal origin | -0.90*** |
| NESB [(b)] | -0.46*** |
| ESB [(b)] | -0.24 |
| Year 12 [(c)] | 0.45** |
| Vocational and Training qualification [(c)] | 0.50*** |
| Bachelor or higher degree [(c)] | 0.44*** |
| Number of other household members aged 0-4 | -0.73*** |
| Number of other household members aged 5-9 | -0.19 |
| Number of other household members aged 10-14 | -0.20 |
| Number of other household members aged 15-23 | -0.57*** |
| Number of other household members aged 24-64 | -1.11*** |
| Number of other household members aged >=65 | -1.42*** |
| Local property prices | 0.12 |
| Victoria [(d)] | -0.02 |
| Queensland [(d)] | -0.06 |
| South Australia [(d)] | 0.60*** |
| Western Australia [(d)] | -0.34* |
| Australian Capital Territory [(d)] | -0.61 |
| Tasmania [(d)] | 0.77** |
| Northern Territory [(d)] | -1.17 |
| Major city | -0.26** |
| Local unemployment rate | -0.69*** |
| Index of relative socio-economic advantage | 0.02 |
| | |
| Observations | 67,691 |
| Number included in the sample | 66,494 |
| Pseudo R2 | 0.131 |
| P t test | 0.153 |

Note: Results (marginal effects) are from a probit model. The dependent variable is equal to one if the individual is in our sample and zero otherwise. Original sample is derived from a FE-IV regression sample of the number of bedrooms. [(a)], [(b)], [(c)] and [(d)] denote single, native, having year 11 or below qualification and New South Wales as the base group, respectively. "P t test" indicates $p$ value from a $t$ test for statistical significance of the retirement variable included in the regression. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A9: Robustness checks

| | Residential mobility | Inter-LGA mobility | Inter-state mobility | Relocation distance | Separate house | Number of bedrooms | Outright homeowner | Mortgaged homeowner | Home value | Monthly rent |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **A. Baseline** | | | | | | | | | | |
| Retired | 11.52** | 11.81*** | 5.65*** | 32.41 | -1.96 | -0.27** | 15.37** | -11.03* | -0.80* | -3.08 |
| | [4.61] | [3.55] | [1.84] | [23.57] | [4.95] | [0.12] | [6.08] | [5.68] | [0.45] | [2.15] |
| Observations | 62,746 | 62,746 | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,490 | 7,705 | 7,933 | 7,934 | 7,934 | 6,645 | 1,500 |
| F-statistic of IV | 474.71 | 474.71 | 474.71 | 480.90 | 482.71 | 496.54 | 499.05 | 499.05 | 402.01 | 49.02 |
| Hausman test (p-value) | 0.06 | 0.01 | 0.01 | 0.38 | 0.79 | 0.05 | 0.11 | 0.30 | 0.09 | 0.29 |
| **B1. Using different retirement definition:** Retired completely from the workforce | | | | | | | | | | |
| Retired completely from the workforce | 9.65** | 10.65*** | 5.02*** | 26.76 | -1.61 | -0.25** | 13.33** | -9.31* | -0.74* | -2.58 |
| | [4.14] | [3.16] | [1.63] | [20.94] | [4.46] | [0.11] | [5.35] | [5.03] | [0.40] | [1.73] |
| Observations | 59,530 | 59,530 | 59,530 | 58,748 | 59,527 | 62,296 | 62,314 | 62,314 | 50,220 | 8,603 |
| Individuals | 7,559 | 7,559 | 7,559 | 7,425 | 7,559 | 7,810 | 7,811 | 7,811 | 6,536 | 1,467 |
| F-statistic of IV | 584.02 | 584.02 | 584.02 | 610.03 | 584.50 | 618.00 | 618.12 | 618.12 | 497.97 | 66.51 |
| Hausman test (p-value) | 0.02 | 0.00 | 0.00 | 0.27 | 0.88 | 0.04 | 0.12 | 0.32 | 0.07 | 0.22 |
| **B2. Using different retirement definition:** Excluding "not in the labour force but wanted to work" from retirement | | | | | | | | | | |
| Not in the LF and did not want to work | 12.55** | 12.87*** | 6.16*** | 35.22 | -2.16 | -0.30** | 16.66** | -11.95* | -0.83* | -3.93 |
| | [5.07] | [3.93] | [2.03] | [25.74] | [5.45] | [0.13] | [6.64] | [6.19] | [0.47] | [2.86] |
| Observations | 62,746 | 62,746 | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,490 | 7,705 | 7,933 | 7,934 | 7,934 | 6,645 | 1,500 |
| F-statistic of IV | 354.83 | 354.83 | 354.83 | 361.63 | 354.91 | 375.05 | 376.64 | 376.64 | 333.31 | 21.01 |
| Hausman test (p-value) | 0.03 | 0.00 | 0.00 | 0.16 | 0.74 | 0.04 | 0.07 | 0.19 | 0.08 | 0.20 |
| **B3. Using different retirement definition:** Using weekly working hours as the dependent variable | | | | | | | | | | |
| Weekly working hours | -0.32** | -0.32*** | -0.15*** | -0.94 | 0.06 | 0.01** | -0.41** | 0.31** | 0.02* | 0.09 |
| | [0.13] | [0.10] | [0.05] | [0.65] | [0.14] | [0.00] | [0.16] | [0.15] | [0.01] | [0.06] |
| Observations | 62,636 | 62,636 | 62,636 | 61,819 | 63,601 | 66,381 | 66,404 | 66,404 | 53,497 | 9,182 |
| Individuals | 7,631 | 7,631 | 7,631 | 7,488 | 7,703 | 7,931 | 7,932 | 7,932 | 6,644 | 1,496 |
| F-statistic of IV | 430.10 | 430.10 | 430.10 | 432.33 | 440.29 | 452.32 | 454.48 | 454.48 | 359.70 | 43.18 |
| Hausman test (p-value) | 0.07 | 0.01 | 0.01 | 0.36 | 0.67 | 0.03 | 0.23 | 0.42 | 0.10 | 0.31 |

Notes: Results for each column in each panel are from a separate FE-IV regression. Other notes: see Table 2.

Appendix Table A9: Robustness checks (continued)

| | Residential mobility | Inter-LGA mobility | Inter-state mobility | Relocation distance | Separate house | Number of bedrooms | Outright homeowner | Mortgaged homeowner | Home value | Monthly rent |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **C1. Using different functional form for age trend:** Linear | | | | | | | | | | |
| Retired | 11.45** | 11.76*** | 5.62*** | 32.40 | -1.93 | -0.27** | 16.08*** | -11.49** | -0.75* | -3.12 |
| | [4.60] | [3.54] | [1.83] | [23.54] | [4.95] | [0.12] | [6.09] | [5.66] | [0.45] | [2.17] |
| Age | 21.14*** | 18.69*** | 6.34*** | 46.95*** | 2.33 | 0.01 | 0.35 | -0.79** | 0.05* | 0.11 |
| | [2.55] | [2.03] | [1.18] | [15.51] | [2.10] | [0.01] | [0.29] | [0.33] | [0.03] | [0.08] |
| Observations | 62,746 | 62,746 | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,490 | 7,705 | 7,933 | 7,934 | 7,934 | 6,645 | 1,500 |
| F-statistic of IV | 475.34 | 475.34 | 475.34 | 481.76 | 483.19 | 499.11 | 501.63 | 501.63 | 405.17 | 48.48 |
| Hausman test (p-value) | 0.06 | 0.01 | 0.01 | 0.38 | 0.80 | 0.05 | 0.09 | 0.27 | 0.10 | 0.29 |
| **C2. Using different functional form for age trend:** Cubic | | | | | | | | | | |
| Retired | 17.48** | 10.51 | 5.79* | 51.65 | -8.76 | -0.40* | 19.95* | -8.63 | -1.10 | -4.47 |
| | [8.91] | [6.73] | [3.48] | [47.34] | [8.63] | [0.21] | [10.20] | [9.34] | [0.78] | [3.20] |
| Age | 42.44* | 12.23 | 5.98 | 122.61 | -22.82 | -0.43 | 24.96 | 4.14 | -0.84 | -3.95 |
| | [22.33] | [16.82] | [9.10] | [120.79] | [20.60] | [0.48] | [22.91] | [21.11] | [2.01] | [4.98] |
| Age squared | -0.35 | 0.09 | -0.00 | -1.19 | 0.40 | 0.01 | -0.33 | -0.11 | 0.02 | 0.06 |
| | [0.35] | [0.26] | [0.14] | [1.83] | [0.32] | [0.01] | [0.36] | [0.33] | [0.03] | [0.08] |
| Age cubed | 0.00 | -0.00 | 0.00 | 0.01 | -0.00 | -0.00 | 0.00 | 0.00 | -0.00 | -0.00 |
| | [0.00] | [0.00] | [0.00] | [0.01] | [0.00] | [0.00] | [0.00] | [0.00] | [0.00] | [0.00] |
| Observations | 62,746 | 62,746 | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,490 | 7,705 | 7,933 | 7,934 | 7,934 | 6,645 | 1,500 |
| F-statistic of IV | 121.81 | 121.81 | 121.81 | 125.59 | 121.84 | 132.76 | 134.01 | 134.01 | 97.50 | 19.13 |
| Hausman test (p-value) | 0.09 | 0.23 | 0.15 | 0.39 | 0.35 | 0.07 | 0.16 | 0.71 | 0.16 | 0.23 |
| **D1. Including additional variables:** General physical health | | | | | | | | | | |
| Retired | 16.23*** | 15.68*** | 7.57*** | 42.62 | -8.68 | -0.24* | 12.13* | -4.96 | -1.31** | -5.41* |
| | [5.88] | [4.58] | [2.43] | [29.63] | [6.11] | [0.14] | [7.37] | [6.85] | [0.56] | [2.83] |
| Observations | 44,025 | 44,025 | 44,025 | 43,477 | 44,850 | 47,282 | 47,288 | 47,288 | 38,794 | 5,839 |
| Individuals | 6,236 | 6,236 | 6,236 | 6,122 | 6,310 | 6,540 | 6,540 | 6,540 | 5,512 | 1,072 |
| F-statistic of IV | 289.27 | 289.27 | 289.27 | 291.06 | 291.23 | 317.04 | 317.33 | 317.33 | 251.44 | 32.05 |
| Hausman test (p-value) | 0.01 | 0.00 | 0.00 | 0.29 | 0.17 | 0.11 | 0.29 | 0.88 | 0.01 | N/A |

Notes: “Physical Component Summary” is constructed from SF-36 physical functioning.

Appendix Table A9: Robustness checks (continued)

| | Residential mobility | Inter-LGA mobility | Inter-state mobility | Relocation distance | Separate house | Number of bedrooms | Outright homeowner | Mortgaged homeowner | Home value | Monthly rent |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| **D2. Including additional variables:** General mental health | | | | | | | | | | |
| Retired | 15.91*** | 15.59*** | 7.67*** | 42.70 | -8.53 | -0.24* | 11.80 | -4.77 | -1.34** | -5.69* |
| | [5.93] | [4.63] | [2.46] | [29.98] | [6.18] | [0.14] | [7.47] | [6.94] | [0.57] | [3.02] |
| Observations | 44,025 | 44,025 | 44,025 | 43,477 | 44,850 | 47,282 | 47,288 | 47,288 | 38,794 | 5,839 |
| Individuals | 6,236 | 6,236 | 6,236 | 6,122 | 6,310 | 6,540 | 6,540 | 6,540 | 5,512 | 1,072 |
| F-statistic of IV | 281.68 | 281.68 | 281.68 | 283.94 | 282.96 | 307.02 | 307.29 | 307.29 | 244.98 | 29.56 |
| Hausman test (p-value) | 0.02 | 0.00 | 0.00 | 0.30 | 0.18 | 0.12 | 0.32 | 0.91 | 0.01 | N/A |
| **D3. Including additional variables:** Disabled condition | | | | | | | | | | |
| Retired | 11.13** | 11.54*** | 5.34*** | 33.18 | -2.39 | -0.28** | 15.48*** | -11.25** | -0.78* | -3.00 |
| | [4.53] | [3.49] | [1.80] | [23.33] | [4.89] | [0.12] | [6.00] | [5.59] | [0.44] | [2.07] |
| Observations | 62,652 | 62,652 | 62,652 | 61,841 | 63,620 | 66,402 | 66,426 | 66,426 | 53,512 | 9,195 |
| Individuals | 7,627 | 7,627 | 7,627 | 7,486 | 7,702 | 7,930 | 7,931 | 7,931 | 6,641 | 1,500 |
| F-statistic of IV | 489.92 | 489.92 | 489.92 | 492.57 | 498.37 | 513.45 | 515.95 | 515.95 | 416.55 | 52.29 |
| Hausman test (p-value) | 0.07 | 0.01 | 0.01 | 0.36 | 0.72 | 0.04 | 0.10 | 0.27 | 0.09 | 0.29 |
| **D4. Including additional variables:** Non-wage income | | | | | | | | | | |
| Retired | 11.47** | 11.76*** | 5.66*** | 32.42 | -1.98 | -0.28** | 15.31** | -10.98* | -0.80* | -3.09 |
| | [4.62] | [3.56] | [1.84] | [23.62] | [4.96] | [0.12] | [6.09] | [5.69] | [0.45] | [2.17] |
| Observations | 62,746 | 62,746 | 62,746 | 61,924 | 63,712 | 66,494 | 66,518 | 66,518 | 53,579 | 9,201 |
| Individuals | 7,633 | 7,633 | 7,633 | 7,490 | 7,705 | 7,933 | 7,934 | 7,934 | 6,645 | 1,500 |
| F-statistic of IV | 473.41 | 473.41 | 473.41 | 479.65 | 481.51 | 495.18 | 497.69 | 497.69 | 401.59 | 48.42 |
| Hausman test (p-value) | 0.06 | 0.01 | 0.01 | 0.38 | 0.79 | 0.05 | 0.11 | 0.30 | 0.09 | 0.29 |
| **D5. Including additional variables:** General life satisfaction | | | | | | | | | | |
| Retired | 11.22** | 11.49*** | 5.60*** | 31.73 | -2.19 | -0.28** | 14.82** | -10.85* | -0.81* | -3.11 |
| | [4.60] | [3.53] | [1.83] | [23.53] | [4.94] | [0.12] | [6.07] | [5.66] | [0.45] | [2.13] |
| Observations | 62,693 | 62,693 | 62,693 | 61,869 | 63,652 | 66,431 | 66,452 | 66,452 | 53,539 | 9,191 |
| Individuals | 7,630 | 7,630 | 7,630 | 7,485 | 7,699 | 7,927 | 7,928 | 7,928 | 6,641 | 1,500 |
| F-statistic of IV | 476.32 | 476.32 | 476.32 | 482.56 | 483.97 | 498.10 | 500.18 | 500.18 | 400.21 | 50.07 |
| Hausman test (p-value) | 0.07 | 0.01 | 0.01 | 0.39 | 0.76 | 0.04 | 0.14 | 0.32 | 0.08 | 0.28 |

Notes: "General mental health" is constructed from SF-36 mental functioning. "Disable condition" refers to the individual's long-term health condition, disability or impairment, constructed from Household Form.

# Appendix Table A10: Heterogeneity

| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Separate regression by | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) |
| **A. Gender** (Male = Yes, Female = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 21.76** | 1.96*** | 18.06** | 10.78** | 8.02** | 5.47** | 16.63*** | 6.47** | 0.47 | -1.75*** | -0.01 | -0.06*** | 6.26*** | 5.48*** | -5.02*** | -5.26*** | -1.55* | -0.10 | -0.58** | -1.14*** |
| | [9.33] | [0.66] | [7.17] | [4.37] | [3.76] | [2.22] | [3.58] | [3.11] | [0.71] | [0.68] | [0.02] | [0.02] | [0.99] | [0.92] | [0.92] | [0.87] | [0.90] | [0.07] | [0.26] | [0.24] |
| Observations | 33,048 | 29,698 | 33,048 | 29,698 | 33,048 | 29,698 | 32,602 | 29,322 | 33,570 | 30,142 | 34,985 | 31,509 | 34,998 | 31,520 | 34,998 | 31,520 | 27,861 | 25,718 | 4,964 | 4,237 |
| Individuals | 3,981 | 3,652 | 3,981 | 3,652 | 3,981 | 3,652 | 3,901 | 3,589 | 4,021 | 3,684 | 4,137 | 3,796 | 4,138 | 3,796 | 4,138 | 3,796 | 3,441 | 3,204 | 792 | 708 |
| Mean of dep. variable | 7.90 | 7.82 | 4.41 | 4.34 | 1.52 | 1.42 | 11.99 | 12.66 | 82.77 | 85.62 | 3.20 | 3.28 | 64.16 | 61.51 | 18.23 | 21.99 | 5.66 | 5.76 | 8.94 | 9.72 |
| F-statistic of IV | 127.75 | | 127.75 | 291.79 | 127.75 | 291.79 | | | | | | | | | | | 117.52 | | | |
| Hausman test (p-value) | 0.05 | | 0.03 | 0.04 | 0.05 | 0.03 | | | | | | | | | | | 0.07 | | | |
| **B. Marital status** (Married/De facto = Yes, Single or Separated/divorced/widowed = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 23.61** | 2.83*** | 20.62** | 9.21** | 8.00** | 5.01** | 16.45*** | 9.62*** | 0.24 | -1.00* | -0.04* | -0.28** | 36.96*** | 5.43*** | -30.87*** | -4.93*** | -0.02 | -0.03 | -0.75*** | -1.07*** |
| | [11.00] | [0.52] | [8.34] | [3.91] | [3.79] | [2.12] | [5.04] | [2.62] | [1.13] | [0.54] | [0.03] | [0.14] | [13.84] | [0.76] | [11.96] | [0.72] | [0.08] | [0.06] | [0.20] | [0.28] |
| Observations | 16,154 | 46,592 | 16,154 | 46,592 | 16,154 | 46,592 | 15,864 | 46,060 | 16,367 | 47,345 | 16,743 | 49,751 | 16,757 | 49,761 | 16,757 | 49,761 | 10,513 | 43,066 | 5,037 | 4,164 |
| Individuals | 2,075 | 5,558 | 2,075 | 5,558 | 2,075 | 5,558 | 2,005 | 5,485 | 2,082 | 5,623 | 2,095 | 5,838 | 2,096 | 5,838 | 2,096 | 5,838 | 1,390 | 5,255 | 792 | 708 |
| Mean of dep. variable | 10.36 | 6.99 | 5.78 | 3.89 | 1.86 | 1.33 | 13.73 | 11.82 | 69.71 | 89.10 | 2.78 | 3.39 | 49.76 | 67.33 | 16.48 | 21.20 | 4.53 | 6.00 | 8.12 | 10.72 |
| F-statistic of IV | 105.42 | | 105.42 | 369.77 | 105.42 | 369.77 | | | | | | 386.98 | 111.15 | | 111.15 | | | | | |
| Hausman test (p-value) | 0.05 | | 0.03 | 0.08 | 0.05 | 0.05 | | | | | | 0.06 | 0.02 | | 0.03 | | | | | |
| **C. Education** (Post school or higher qualification = Yes, Year 12 or below = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 19.02*** | 2.23*** | 18.74*** | 2.26*** | 9.55*** | 0.79*** | 13.22*** | 9.89*** | -1.54** | -0.33 | -0.33* | -0.03** | 22.93*** | 5.02*** | -5.47*** | -4.87*** | -1.53** | -0.08 | -0.88*** | -0.80*** |
| | [7.11] | [0.64] | [5.41] | [0.51] | [2.77] | [0.28] | [3.87] | [2.98] | [0.78] | [0.64] | [0.18] | [0.02] | [8.89] | [0.92] | [0.93] | [0.87] | [0.66] | [0.07] | [0.24] | [0.23] |
| Observations | 29,846 | 32,842 | 29,846 | 32,842 | 29,846 | 32,842 | 29,468 | 32,399 | 30,280 | 33,372 | 32,008 | 34,423 | 32,018 | 34,437 | 32,018 | 34,437 | 24,439 | 29,099 | 5,458 | 3,726 |
| Individuals | 3,542 | 4,084 | 3,542 | 4,084 | 3,542 | 4,084 | 3,476 | 4,007 | 3,581 | 4,117 | 3,743 | 4,183 | 3,743 | 4,184 | 3,743 | 4,184 | 2,964 | 3,677 | 836 | 662 |
| Mean of dep. variable | 7.71 | 8.00 | 4.10 | 4.63 | 1.37 | 1.56 | 11.17 | 13.37 | 82.70 | 85.43 | 3.14 | 3.33 | 62.98 | 62.85 | 16.27 | 23.51 | 4.96 | 6.34 | 8.15 | 10.98 |
| F-statistic of IV | 227.55 | | 227.55 | | 227.55 | | | | | | 244.14 | | 244.78 | | | | 198.99 | | | |
| Hausman test (p-value) | 0.02 | | 0.00 | | 0.00 | | | | | | 0.10 | | 0.06 | | | | 0.01 | | | |

Notes: Results for different sub-populations are obtained from a separate regression. FE-IV results are reported when the exogeneity of retirement is not rejected and FE results if otherwise. F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instrument in the first-stage regression. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variable. Coefficient estimates, standard errors and mean for all binary dependent variables are multiplied by 100 for aesthetic purposes. Other explanatory variables include the individual characteristics (age and age squared, completed qualifications, marital status), household characteristics (number of household members at various age groups), local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

## Appendix Table A10: Heterogeneity (continued)

| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Separate regression by | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) |
| **D. Home homeownership status** (Outright homeowner = Yes, Purchaser or Renter = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 3.75*** | 1.96*** | 3.27*** | 10.64** | 9.29*** | 0.64*** | 16.07*** | 8.21*** | -1.47* | -0.18 | -0.49** | -0.03** | 11.11*** | 32.19*** | -9.89*** | -27.59*** | -0.19** | -1.15* | -0.90*** | |
| | [0.84] | [0.51] | [0.64] | [4.31] | [3.33] | [0.23] | [4.47] | [2.26] | [0.87] | [0.55] | [0.20] | [0.02] | [1.16] | [7.40] | [1.21] | [5.92] | [0.09] | [0.59] | [0.17] | |
| Observations | 27,067 | 35,679 | 27,067 | 35,679 | 27,067 | 35,679 | 26,515 | 35,409 | 27,524 | 36,188 | 28,350 | 38,144 | 28,366 | 38,152 | 28,366 | 38,152 | 16,767 | 36,812 | 9,173 | |
| Individuals | 3,474 | 4,159 | 3,474 | 4,159 | 3,474 | 4,159 | 3,373 | 4,117 | 3,516 | 4,189 | 3,565 | 4,368 | 3,566 | 4,368 | 3,566 | 4,368 | 2,221 | 4,424 | 1,494 | |
| Mean of dep. variable | 11.35 | 5.21 | 6.06 | 3.10 | 2.03 | 1.05 | 17.21 | 8.64 | 76.63 | 89.81 | 3.12 | 3.32 | 23.77 | 92.00 | 40.47 | 4.80 | 5.87 | 5.63 | 9.31 | |
| F-statistic of IV | | | | 256.30 | 178.94 | | | | | | 194.63 | | | 257.24 | | 257.24 | | 249.66 | | |
| Hausman test (p-value) | | | | 0.04 | 0.01 | | | | | | 0.02 | | | 0.00 | | 0.00 | | 0.04 | | |
| **E. Income** (> median income = Yes, <= median income = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 25.29** | 2.55*** | 22.27** | 2.65*** | 12.40*** | 0.85*** | 11.60*** | 11.38*** | -0.90 | -0.81 | -0.02 | -0.04*** | 3.72*** | 23.15*** | -3.35*** | -20.41** | -0.10 | -1.34** | -0.58** | -1.00*** |
| | [11.59] | [0.59] | [8.97] | [0.47] | [4.70] | [0.26] | [2.91] | [3.49] | [0.86] | [0.60] | [0.02] | [0.02] | [0.96] | [8.32] | [0.92] | [8.01] | [0.08] | [0.66] | [0.23] | [0.29] |
| Observations | 29,802 | 32,944 | 29,802 | 32,944 | 29,802 | 32,944 | 29,336 | 32,588 | 30,351 | 33,361 | 32,298 | 34,196 | 32,312 | 34,206 | 32,312 | 34,206 | 24,042 | 29,537 | 6,038 | 3,163 |
| Individuals | 3,748 | 3,885 | 3,748 | 3,885 | 3,748 | 3,885 | 3,656 | 3,834 | 3,798 | 3,907 | 3,967 | 3,966 | 3,968 | 3,966 | 3,968 | 3,966 | 3,076 | 3,569 | 927 | 573 |
| Mean of dep. variable | 7.90 | 7.80 | 4.31 | 4.43 | 1.48 | 1.46 | 10.75 | 13.71 | 82.67 | 85.44 | 3.08 | 3.38 | 63.33 | 62.50 | 14.09 | 25.61 | 4.80 | 6.44 | 7.72 | 12.31 |
| F-statistic of IV | 98.30 | | 98.30 | | 98.30 | | | | | | | | | 265.74 | | 265.74 | | 215.89 | | |
| Hausman test (p-value) | 0.05 | | 0.02 | | 0.01 | | | | | | | | | 0.04 | | 0.06 | | 0.04 | | |
| **F. Asset** (> median asset = Yes, <= median asset = No) | | | | | | | | | | | | | | | | | | | | |
| Retired | 3.29*** | 2.76*** | 14.11*** | 2.54*** | 1.25*** | 0.70*** | 15.74*** | 11.21*** | 0.42 | -1.63** | -0.04* | -0.40** | 19.55** | 5.40*** | -4.76*** | -5.61*** | 0.01 | -1.77** | -0.86*** | -1.51** |
| | [0.79] | [0.60] | [4.94] | [0.45] | [0.34] | [0.25] | [4.29] | [2.78] | [0.86] | [0.63] | [0.02] | [0.20] | [8.08] | [0.93] | [1.05] | [0.86] | [0.04] | [0.89] | [0.19] | [0.69] |
| Observations | 26,531 | 27,355 | 26,531 | 27,355 | 26,531 | 27,355 | 26,373 | 27,219 | 26,769 | 27,637 | 27,855 | 28,321 | 27,866 | 28,325 | 27,866 | 28,325 | 19,336 | 26,556 | 6,765 | 664 |
| Individuals | 2,489 | 2,488 | 2,489 | 2,488 | 2,489 | 2,488 | 2,488 | 2,488 | 2,489 | 2,488 | 2,489 | 2,488 | 2,489 | 2,488 | 2,489 | 2,488 | 1,918 | 2,460 | 804 | 160 |
| Mean of dep. variable | 8.68 | 6.21 | 4.53 | 3.49 | 1.13 | 0.98 | 13.48 | 11.04 | 79.64 | 89.09 | 2.94 | 3.53 | 53.58 | 75.58 | 18.12 | 19.93 | 3.49 | 7.32 | 8.48 | 16.41 |
| F-statistic of IV | | | 277.73 | | | | | | | | | 161.90 | 297.03 | | | | | 152.87 | | |
| Hausman test (p-value) | | | 0.02 | | | | | | | | | 0.06 | 0.10 | | | | | 0.05 | | |

Appendix Table A11: Impact of own and spousal retirement on housing choices of coupled individuals - First-stage regression results

| Variable | Residential mobility | | Relocation distance | | Separate house | | Number of bedrooms | | Outright homeowner | | Home value | | Monthly rent | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Self | Partner | Self | Partner | Self | Partner | Self | Partner | Self | Partner | Self | Partner | Self | Partner |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| Age >= PEA | 10.45*** | 3.49*** | 10.56*** | 3.48*** | 10.38*** | 3.60*** | 10.39*** | 3.60*** | 10.39*** | 3.60*** | 10.19*** | 3.54*** | 9.77*** | 1.96 |
| | [0.99] | [0.91] | [1.00] | [0.91] | [0.98] | [0.90] | [0.95] | [0.88] | [0.96] | [0.88] | [1.01] | [0.94] | [3.14] | [2.56] |
| Partner's age >= PEA | 2.68** | 8.02*** | 2.74** | 8.02*** | 2.72** | 7.90*** | 2.69** | 7.85*** | 2.68** | 7.86*** | 3.07*** | 7.82*** | -0.88 | 6.94** |
| | [1.14] | [1.15] | [1.14] | [1.16] | [1.13] | [1.15] | [1.11] | [1.13] | [1.11] | [1.13] | [1.17] | [1.19] | [3.31] | [3.10] |
| Age | 4.63 | 5.60 | 5.18 | 5.72 | 6.80* | 7.26* | 3.66** | 8.06*** | 3.66** | 8.07*** | 4.58** | 8.39*** | -3.30 | 0.97 |
| | [3.94] | [3.86] | [3.97] | [3.88] | [3.90] | [3.82] | [1.70] | [1.71] | [1.70] | [1.71] | [1.79] | [1.82] | [4.69] | [5.04] |
| Age squared | -0.00 | -0.04*** | -0.00 | -0.04*** | -0.01 | -0.04*** | -0.01 | -0.04*** | -0.01 | -0.04*** | -0.01 | -0.04*** | 0.05 | -0.04 |
| | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.04] | [0.04] |
| Partner's age | 3.32*** | -2.41** | 3.34*** | -2.30* | 3.29*** | -2.41** | 3.31*** | -2.33** | 3.32*** | -2.33** | 3.31*** | -2.69** | 1.69 | 4.41* |
| | [1.09] | [1.18] | [1.10] | [1.19] | [1.09] | [1.18] | [1.06] | [1.13] | [1.06] | [1.13] | [1.14] | [1.19] | [2.38] | [2.61] |
| Partner's age squared | -0.03*** | 0.02** | -0.03*** | 0.02* | -0.03*** | 0.02* | -0.03*** | 0.02* | -0.03*** | 0.02* | -0.03*** | 0.01 | -0.03 | 0.01 |
| | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.01] | [0.02] | [0.02] |
| Year 12 [(a)] | 4.18 | -9.35 | 4.46 | -9.36 | 3.35 | -9.54 | 5.90 | -6.08 | 5.90 | -6.05 | 9.19 | 6.11 | 63.48 | -13.02 |
| | [8.77] | [11.80] | [8.84] | [11.86] | [8.69] | [11.63] | [8.56] | [11.86] | [8.50] | [11.74] | [8.75] | [11.67] | [48.44] | [14.73] |
| Partner's Year 12 [(b)] | -9.21 | -2.06 | -9.39 | -1.01 | -9.47 | -2.53 | -7.97 | 1.01 | -7.97 | 1.01 | 6.19 | 6.59 | -8.81** | 5.51 |
| | [9.82] | [8.63] | [10.03] | [8.76] | [9.73] | [8.56] | [9.77] | [8.70] | [9.77] | [8.70] | [10.54] | [10.18] | [3.92] | [8.09] |
| Vocational and Training qualification [(a)] | 6.00 | -3.73 | 5.59 | -4.58 | 5.71 | -3.58 | 7.77 | -0.43 | 7.77 | -0.43 | 9.38 | 3.42 | 8.26 | -3.92 |
| | [6.34] | [4.79] | [6.40] | [4.66] | [6.29] | [4.78] | [6.02] | [5.05] | [6.02] | [5.05] | [6.86] | [5.29] | [13.54] | [10.32] |
| Partner's Vocational and Training qualification [(b)] | -2.42 | -2.15 | -2.28 | -1.17 | -2.46 | -2.29 | -2.38 | -1.07 | -2.39 | -1.07 | 5.74 | 1.67 | -14.33*** | 0.89 |
| | [4.04] | [4.61] | [4.12] | [4.65] | [4.02] | [4.57] | [4.17] | [4.52] | [4.17] | [4.52] | [4.73] | [5.45] | [3.57] | [8.17] |
| Bachelor or higher degree [(a)] | -9.79 | -23.84*** | -9.93 | -24.43*** | -11.21 | -24.09*** | -8.63 | -20.61** | -8.63 | -20.60** | 1.16 | -10.34 | -35.31 | -30.75** |
| | [10.12] | [8.69] | [10.20] | [8.67] | [10.20] | [8.52] | [9.82] | [8.61] | [9.81] | [8.60] | [9.48] | [8.19] | [24.11] | [12.73] |
| Partner's Bachelor or higher degree [(b)] | -10.61 | -19.82** | -10.14 | -17.22** | -11.04 | -20.71*** | -10.09 | -19.43** | -10.09 | -19.43** | 0.61 | -12.75 | -43.26*** | -24.19** |
| | [8.38] | [7.75] | [8.60] | [7.65] | [8.26] | [7.69] | [8.42] | [7.66] | [8.42] | [7.66] | [8.45] | [8.15] | [15.47] | [9.48] |
| Observations | 42,368 | 42,368 | 41,934 | 41,934 | 43,023 | 43,023 | 44,982 | 44,982 | 44,988 | 44,988 | 39,404 | 39,404 | 3,628 | 3,628 |
| Individuals | 5,298 | 5,298 | 5,240 | 5,240 | 5,362 | 5,362 | 5,541 | 5,541 | 5,541 | 5,541 | 4,991 | 4,991 | 652 | 652 |
| R-squared | 0.211 | 0.196 | 0.212 | 0.197 | 0.211 | 0.196 | 0.216 | 0.200 | 0.216 | 0.200 | 0.224 | 0.208 | 0.111 | 0.096 |

Notes: Results are from the first stage of FE-IV regression. [(a)] and [(b)] denotes the individual and partner having year 11 or below qualification as the base group, respectively. Other included variables: number of household members at various age groups, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. Coefficient estimates and standard errors are multiplied by 100 for aesthetic purposes. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A12: Impact of own and spousal retirement on housing choice of coupled individuals - results from FE and FE-IV models

| | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV | FE | FE-IV |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Residential mobility | | Inter-LGA mobility | | Inter-state mobility | | Relocation distance (km) | | Separate house | |
| Own retirement | 1.94*** | 5.54 | 1.72*** | 7.69 | 0.68*** | 3.59 | 7.17** | 21.01 | -0.64 | 3.36 |
| | [0.54] | [7.19] | [0.42] | [5.67] | [0.26] | [3.08] | [3.06] | [41.08] | [0.52] | [7.13] |
| Spousal retirement | 2.67*** | 14.72 | 2.06*** | 7.42 | 1.03*** | 2.46 | 9.59*** | 17.43 | -0.99* | -7.77 |
| | [0.54] | [9.28] | [0.42] | [7.28] | [0.25] | [3.92] | [3.44] | [54.49] | [0.51] | [9.84] |
| Observations | 42,368 | 42,368 | 42,368 | 42,368 | 42,368 | 42,368 | 41,934 | 41,934 | 43,023 | 43,023 |
| Individuals | 5,298 | 5,298 | 5,298 | 5,298 | 5,298 | 5,298 | 5,240 | 5,240 | 5,362 | 5,362 |
| Mean of dep. variable | 6.76 | 6.76 | 3.78 | 3.78 | 1.27 | 1.27 | 11.83 | 11.83 | 89.95 | 89.95 |
| F-statistic of IV | | 44.52 | | 44.52 | | 44.52 | | 44.43 | | 43.01 |
| Hausman test (p-value) | | 0.05 | | 0.04 | | 0.13 | | 0.78 | | 0.78 |
| | Number of bedrooms | | Outright homeowner | | Mortgaged homeowner | | Home value ($100,000) | | Monthly rent ($100) | |
| Own retirement | -0.02 | -0.10 | 4.02*** | 5.76 | -3.54*** | 2.20 | -0.01 | -0.21 | -1.10*** | -4.56 |
| | [0.02] | [0.18] | [0.79] | [9.78] | [0.75] | [9.49] | [0.06] | [0.70] | [0.30] | [3.32] |
| Spousal retirement | -0.03* | -0.27 | 3.47*** | -0.45 | -4.03*** | -5.24 | 0.04 | -0.12 | -0.30 | -6.63 |
| | [0.01] | [0.26] | [0.78] | [13.90] | [0.75] | [13.52] | [0.06] | [0.89] | [0.27] | [6.39] |
| Observations | 44,982 | 44,982 | 44,988 | 44,988 | 44,988 | 44,988 | 39,404 | 39,404 | 3,628 | 3,628 |
| Individuals | 5,541 | 5,541 | 5,541 | 5,541 | 5,541 | 5,541 | 4,991 | 4,991 | 652 | 652 |
| Mean of dep. variable | 3.41 | 3.41 | 67.83 | 67.83 | 21.66 | 21.66 | 5.97 | 5.97 | 10.84 | 10.84 |
| F-statistic of IV | | 44.40 | | 44.48 | | 44.48 | | 35.86 | | 4.53 |
| Hausman test (p-value) | | 0.22 | | 0.96 | | 0.73 | | 0.84 | | N/A |

Notes: FE results are from modified equation (1) while FE-IV results from modified equations (1) and (2). Instruments: own age >= PEA and partner's age >=PEA. F-statistic of IV denotes the Cragg-Donald Wald F statistic for the excluded instruments in the first-stage regression. Regression results from first stage are reported in Appendix Table A11. Hausman test (p-value) reports p-value from a Hausman test of exogeneity of the endogenous variables (this statistic cannot be calculated for monthly rent and denoted as "Not Available" (N/A), probably due to small sample size). Coefficient estimates, standard errors and mean for all binary dependent variables are multiplied by 100 for aesthetic purposes. Other explanatory variables include characteristics (age and age squared, completed qualifications) of the individual and that of partner, household characteristics (number of household members at various age groups), local property prices, local socio-economic background variables, state/territory dummies, year dummies, and survey quarters. Robust standard errors clustered at the individual level in parentheses. The symbol *denotes significance at the 10% level, **at the 5% level, and ***at the 1% level.

Appendix Table A13: Correlation structure among neighbourhood quality perception variables

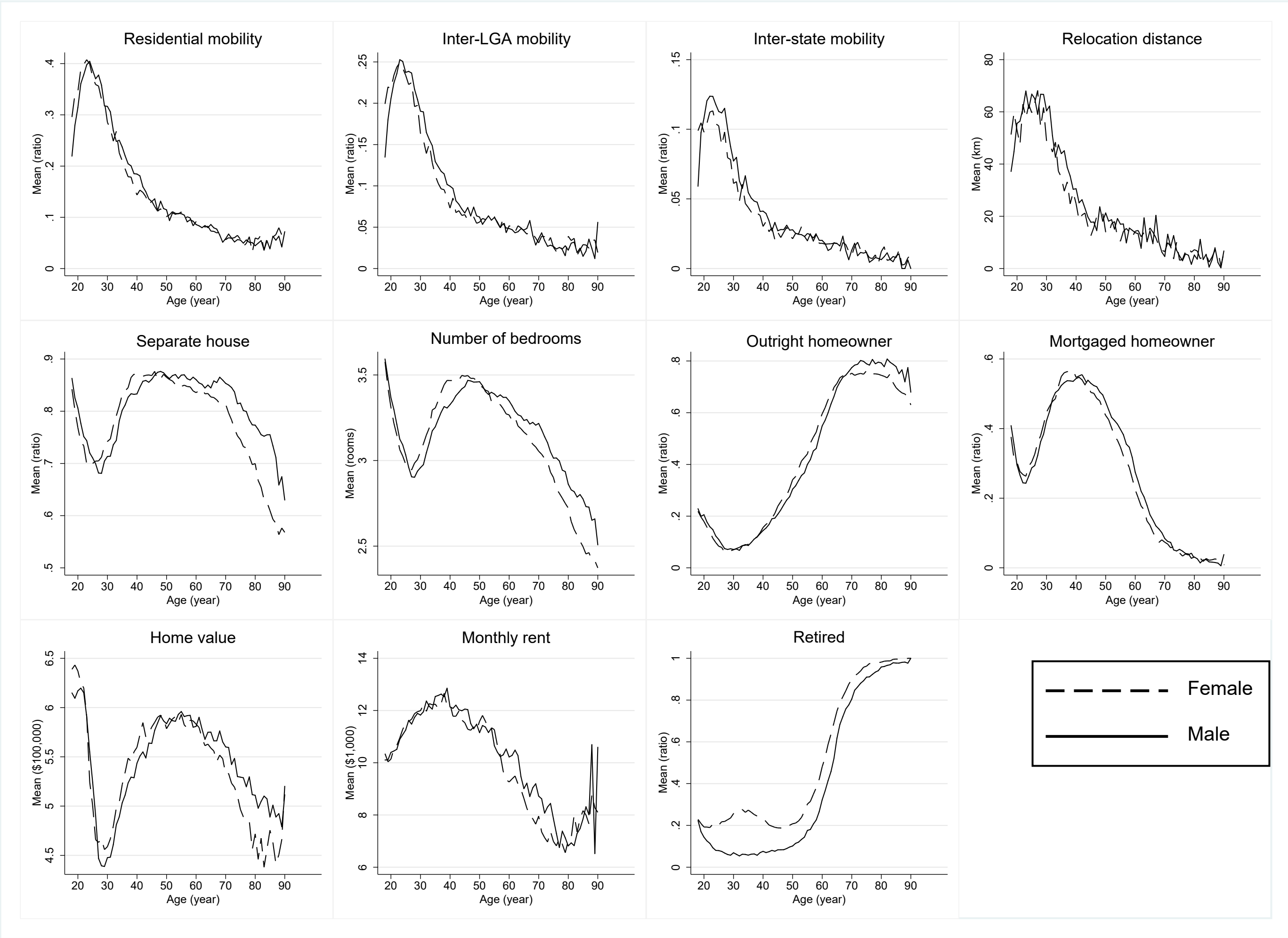
| | External condition of dwelling (b) | Neighbours helping each other out (a) | Neighbours doing things together (a) | Traffic noise (b) | Noise from airplanes, trains or industry (b) | Homes and gardens in bad condition (b) | Rubbish and litter lying around (b) | Teenagers hanging around on the streets (b) | People being hostile and aggressive (b) | Vandalism and deliberate damage to property (b) | Burglary and theft (b) | Distance to coast |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| External condition of dwelling (b) | 1.00 | | | | | | | | | | | |
| Neighbours helping each other out (a) | -0.04 | 1.00 | | | | | | | | | | |
| Neighbours doing things together (a) | -0.03 | 0.69 | 1.00 | | | | | | | | | |
| Traffic noise (b) | 0.10 | -0.14 | -0.11 | 1.00 | | | | | | | | |
| Noise from airplanes, trains or industry (b) | 0.08 | -0.07 | -0.02 | 0.41 | 1.00 | | | | | | | |
| Homes and gardens in bad condition (b) | 0.09 | -0.12 | -0.07 | 0.28 | 0.25 | 1.00 | | | | | | |
| Rubbish and litter lying around (b) | 0.09 | -0.11 | -0.05 | 0.34 | 0.28 | 0.59 | 1.00 | | | | | |
| Teenagers hanging around on the streets (b) | 0.06 | -0.09 | -0.04 | 0.39 | 0.26 | 0.36 | 0.50 | 1.00 | | | | |
| People being hostile and aggressive (b) | 0.08 | -0.12 | -0.03 | 0.34 | 0.27 | 0.38 | 0.49 | 0.61 | 1.00 | | | |
| Vandalism and deliberate damage to property (b) | 0.05 | -0.08 | -0.03 | 0.35 | 0.23 | 0.36 | 0.48 | 0.66 | 0.65 | 1.00 | | |
| Burglary and theft (b) | 0.05 | -0.07 | -0.05 | 0.31 | 0.22 | 0.31 | 0.40 | 0.54 | 0.52 | 0.73 | 1.00 | |
| Distance to coast | 0.10 | 0.05 | 0.05 | -0.05 | -0.07 | | | -0.04 | -0.02 | -0.03 | -0.04 | 1.00 |

Notes: Only correlations which are statistically significant at the 1% level or lower are listed. All variables (except distance to coast) are measured on a 1-5 scale. For variables superscripted with (a), a higher value indicates a more desirable characteristic while the opposite is true for variables superscripted with (b). Sample: Individuals aged between 55 to 75 with valid responses to the neighbourhood quality perception variables.

Appendix Figure A1: Historical eligibility ages for Australian Age Pension

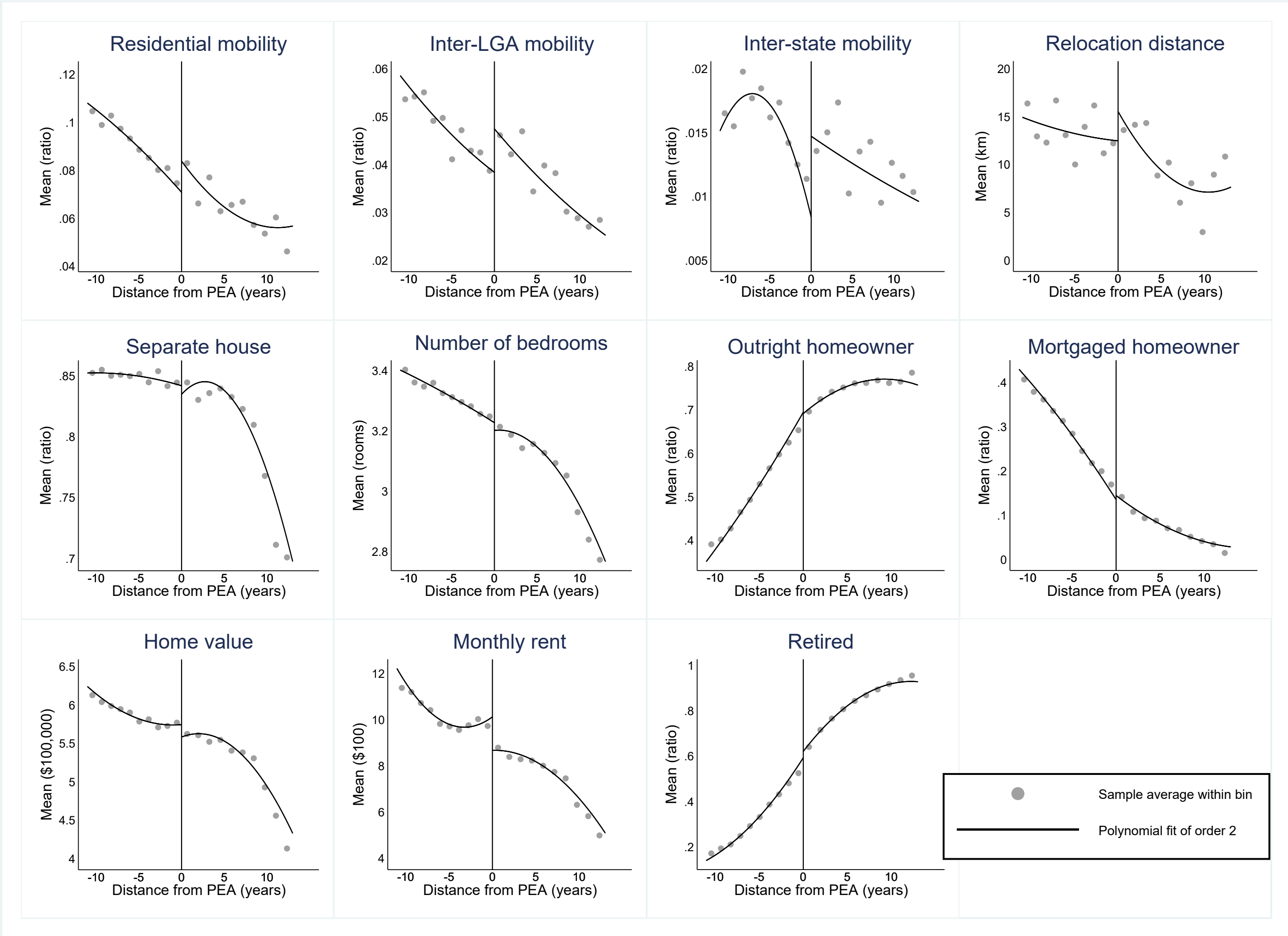

Notes: Source: Australian Government Department of Social Services (2020)

Appendix Figure A2: Housing choices and labour force status by age and gender




Notes: Data source HILDA release 19.

Appendix Figure A3: Retirement and housing choices by distance to/from pension eligibility age




Notes: This figure is obtained by regression functions with uniform kernel weights on a 2nd order polynomial function, fitted separately above and below the cut-off.