Housing equity withdrawal in later life: regional pension inadequacy and the local economy

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Abstract

UK pensioners exhibit little interest in using their homes to support their retirement. In this study, we find that house values, household financial circumstances and financial characteristics explain the low level of housing equity withdrawal and its variation across regions while there is little evidence for the existence of local financial ecologies. Our model also shows that households choose to downsize or use an equity release plan according to which method releases most equity and costs least. We also show that releasing housing wealth would double household private pension wealth in the South of England and boost the regional economy by 30 per cent in Wales, the South East and South West.

Keywords: equity release; downsizing; and retirement

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1 Introduction

The House of Lords *Ready for Ageing* report concluded that pension saving in the UK was inadequate and that the government should encourage pensioners to use their housing wealth to help pay for the cost of their social care, and to release money to adapt their homes and to support their incomes (Lords, 2013). However, financial products to facilitate withdrawing housing equity are little used and government proposals to use house values to support care for the elderly have been fiercely resisted.

Almost 80 per cent of people aged 65–74 in the United Kingdom (UK) own their own home and two-thirds of those over 65 years of age are homeowners without a mortgage (ONS, 2016). With less generous pensions, and more retirees with debt and a lack of retirement savings, many households' most valuable asset is now their home (Rowlingson, 2012; Clarke et al., 2016). Many homeowners approaching retirement express an intention to either downsize or borrow against the value of their home but the reality is that only a small percentage ever do (Terry and Gibson, 2010; Leach, 2012). Why more people do not use their home to supplement retirement income is not well understood (Burgess et al., 2013). In this study, we develop a model of the decision to use an equity release plan or downsize in order to understand the low level of housing equity withdrawal as well as regional variations in this activity across the UK.

Property offers a means of supplementing inadequate pension incomes, but pensioners in regions with the highest house values often tend to also have the best pension provision (Clarke et al., 2016). House price inflation has led to a spatial concentration of wealth in the South of England (Fahmy et al., 2008), reinforcing existing patterns of financial exclusion and geographies of pension consumption (Sunley, 2000). Housing equity withdrawal (HEW) also displays a similar spatial distribution with the highest number of equity release plans and overall lending being in London and the South East (Key Retirement, 2017). Downsizing is also more common in the South East where four times as much equity can be released than in the North (Beach, 2016).

These spatial patterns may be linked to uneven house price inflation or perhaps differences in financial characteristics across the UK. Strauss and Clark (2010) attribute spatial

inequalities in pensioners' incomes and assets to divisions in employment and health, and the existence of financial ecologies with regional variations in attitudes to retirement saving, risk-taking and confidence in financial knowledge. Leyshon et al. (2006) demonstrate how geographical variation in the provision of financial services interacts with local trust and knowledge, leading to customers in some areas being more financially knowledgeable and more confident in dealing with financial products and financial institutions, having better access to credit, and being more active in searching out the most cost-effective and appropriate financial solutions.

Historically, the main channel for HEW has been downsizing where the homeowner moves house or changes from ownership to rental tenure (Banks et al., 2010). To avoid moving, the homeowner can take out an equity release plan where the income released depends on the age of the borrower, and the quality and location of the home (ERC, 2017a). Angelini and Laferrère (2012) find that downsizing and equity release plans are substitutes as methods of withdrawing housing wealth. However, both forms of housing equity withdrawal are not common in practice (Calvo et al., 2009; Overton et al., 2017).

In our analysis, we use a nested logit model and data from the British Wealth and Assets Survey (WAS) to explain regional variations in patterns of HEW. We test for the effects of regional variations in house values, wealth and financial attitudes on this decision and also test for residual regional effects possibly due to financial ecologies or spatial differences in access to financial services. Our model also allows us to explore the influence of these variables on the overall low level of HEW. We conclude our investigation by quantifying the impact HEW could make on retiree wealth and on gross value added (GVA) in each region if every homeowner eligible to withdraw housing equity proceeded to do so.

A number of original findings arise from the analysis, which we anticipate will enhance understanding of the contribution of housing wealth to spatial inequalities in retiree living standards. First, variations in financial circumstances, such as high levels of debt, and in the financial characteristics of the head of household, such as a tendency to overspend, along with variations in house values are found to explain much of the spatial patterns

in HEW. Second, households choose the equity withdrawal method that enables most equity to be released but are deterred by the relative cost of the particular form of equity withdrawal. Third, we estimate that the amount that can be released by either downsizing or equity release is as large as the household private pension pot in the South of England but only half as large in Scotland and the North East. The contribution of equity withdrawal to regional economies was also found to be substantial, ranging from a boost to GVA of 6–7 per cent in London to over 30 per cent in Wales, the South East, and South West.

The rest of the paper is structured as follows. In Section 2, the literature is reviewed. Data and methods are described in Section 3. Descriptive statistics are detailed in Section 4, with empirical results analysed in Section 5. Concluding comments are presented in Section 6.

2 Literature Review

2.1 Spatial inequality: the role of house price inflation, culture, and financial ecologies

In most Western countries, a majority of personal savings for old age takes the form of housing wealth (Costa-Font et al., 2010; Davies et al., 2011; Ong et al., 2013). In the United States, 62 per cent of the net wealth of the median household is in single-family residential housing (Wolff, 2016). For euro area countries, the mean contribution of the primary residence to household wealth is an average of 49 per cent (Mathä et al., 2017). For Great Britain, the contribution of net property wealth to total wealth for the median household is 32 per cent (ONS, 2015).[1] In GB, housing wealth is the most widely spread asset (Hamnett, 2010). However, not all homeowners have access to the same amount of wealth because housing wealth is affected by an unequal growth in regional house

[1]Cross-country differences in the contribution of housing wealth to total wealth are primarily due to differences in home ownership rates and in house price inflation. Other factors are differences in fiscal measures promoting home ownership, the supply of rental and social housing and the availability of mortgage finance (Muellbauer and Murphy, 2008; Chiuri and Jappelli, 2010).

prices with inequalities influenced by both when and where housing is bought (Searle and McCollum, 2014). Household property wealth is greater than pension wealth in all regions of GB but the differential is greatest in London and the South of England (Belfield et al., 2015; ONS, 2015).

Attitudinal and cultural differences across countries and within countries have also been demonstrated to influence household financial decisions (Badarinza et al., 2016). Regional differences in financial confidence and knowledge (Bucher-Koenen and Lusardi, 2011) and attitudes to risk (Clery et al., 2007; Clark et al., 2009; MacLeod et al., 2012) have been found to shape attitudes to pension saving and retirement planning. Guiso and Sodini (2013) find that trust in formal financial institutions and systems differs across countries and regions, and low levels of trust reduce household participation in markets. Strauss and Clark (2010) suggest that spatial inequalities in pensioners' incomes emerge due to the existence of 'financial ecologies', which are caused and accentuated by regional variations in attitudes to retirement saving, risk-taking, financial confidence, and knowledge and trust in financial institutions.

Leyshon et al. (2004) argue that financial ecologies emerge over time and produce, and are produced by, different resources, experiences, and levels of access to mainstream financial institutions.[2] Areas such as London and the South of England are considered as connected and are typified by a diverse and sophisticated financial infrastructure, leading to customers who are more financially knowledgeable; more confident in dealing with financial products and financial institutions; have better access to credit; and are more active in searching out financial opportunities. Peripheral areas also emerge. These areas are overlooked by mainstream financial service providers, with customers there having reduced access to financial products and services. Over time, this results in a reinforcing decline in financial knowledge, as well as in confidence and trust in financial institutions. The divergence between connected and peripheral areas is accentuated in periods of financial crisis due to higher closure rates of financial institutions in less connected areas

[2]The concept of financial ecologies has been explored in relation to clustering of and customer interaction with retail financial service providers, door-step-lenders, fin-tech companies, and crowd funders (Leyshon et al., 2006; Lai, 2016; Langley and Leyshon, 2017)

(Hutton and Lee, 2012; Marshall, 2013; Wójcik and MacDonald-Korth, 2015; Zhao and Jones-Evans, 2016).

2.2 Divestment of housing wealth: downsizing and equity release schemes

Historically, the main channel for HEW has been downsizing. This can take different forms including a reduction in dwelling size, number of rooms, value of the dwelling, or even a change from ownership to rental tenure (Banks et al., 2010). The income released from downsizing is dependent on dwelling type, location, and conditions in the housing market including the level and volatility of house prices (Reynolds et al., 2004; Angelini and Laferrère, 2012). Beach (2016) calculates that downsizing by one bedroom would release the highest amount in London (£71,262) and the lowest amount in Wales (£24,237).[3] Non-monetary reasons have also been identified as important in the decision to downsize and include moving closer to family (Banks et al., 2010; Luborsky et al., 2011), difficulties in maintaining a large house (Clark and Deurloo, 2006; Painter and Lee, 2009), changes in household composition (Ermisch and Jenkins, 1999; Painter and Lee, 2009; Banks et al., 2010) and health problems (Ostrovsky et al., 2002; Painter and Lee, 2009). For those wishing to remain in their own homes an alternative to downsizing is to borrow against home equity through the purchase of an equity release plan (Costa-Font et al., 2010; Burgess et al., 2013). The income released through an equity release scheme depends on the age of the borrower, and the quality and location of the home (ERC, 2017a).

Both forms of HEW are identified as more likely in households with difficulties in smoothing consumption due to problem debt, few liquid assets, and collateral constraints (Skinner, 1996; Carroll et al., 2003; Klyuev and Mills, 2007). Benito (2009) suggests that housing offers a financial buffer by providing collateral for borrowing and therefore many households consider HEW as risky and a last resort solution to financial problems

[3]The figures show the average equity released for a one-bedroom change. The amount released would be double if the person downsized by two bedrooms.

(Brennan and Ritch, 2010; Jones et al., 2012). Risk aversion is also found to increase with age, and a number of studies now confirm elderly owners' anxiety about increasing debt secured against their home (Costa-Font et al., 2010). Many retirees have been shown to lack confidence in dealing with financial matters, and financial confidence is found to influence the decision to engage in HEW (Fox O'Mahony and Overton, 2015b). A lack of trust in financial providers, particularly in the post-financial crisis period, has also been highlighted as adversely impacting on the decision to withdraw housing equity (CFPB, 2012; Burgess et al., 2013).

The bequest motive has often been cited as an important impediment to HEW, with the withdrawal of housing equity viewed as 'eating into' the children's inheritance (Toussaint and Elsinga, 2009). The desire to bequest has been identified as a factor both in reducing the incidence of downsizing (Munnell et al., 2007; Banks et al., 2010; Nakajima and Telyukova, 2017) and in restricting the uptake of equity release plans (Sass et al., 2017). However, some studies have suggested that the desire to bequest may actually be facilitated through HEW. Equity release plans, for example, are used in different ways by different income groups, with those on high incomes using them to make early bequests and large one-off purchases (Redfoot et al., 2007; Overton, 2010; Burgess et al., 2013).[4] It has also been noted that the income generated from downsizing can be reinvested in risk-free government securities and can then be bequeathed as a liquid asset when required (Jefferson et al., 2017).

The major deterrent to HEW, however, appears to be transaction costs. Skinner (1996) suggests that housing wealth is in fact a 'sideshow' if transaction costs are high and/or financial markets do not offer products that facilitate HEW. Yang (2009), in a dynamic, general equilibrium model of lifecycle behaviour, demonstrates that transaction costs are crucial in generating the slow downsizing of housing assets. Beach (2016) finds that the main barrier to downsizing for UK homeowners is transaction costs which are accentuated by supply-side factors that include the supply of housing lagging behind existing (and growing) demand and limited availability of specialist retirement housing.

[4]Those on modest incomes are found to use equity release plans to help maintain or enhance existing lifestyles, while those that are just getting by use them to relieve financial hardship or pay off debt.

Sass et al. (2017) highlight transaction costs as a major inhibitor to downsizing for US homeowners and calculate that commissions, closing costs and moving and fixing up a new home can amount to 10 per cent or more of the sale price.

Transaction costs in the form of initial set-up costs and ongoing interest rate charges have also been identified as inhibiting uptake of equity release products (Davidoff, 2015; Nakajima and Telyukova, 2017). Typically the initial set-up costs include valuation fees and administration charges payable to the provider as well as fees to a solicitor and a financial adviser which may equate to 3 per cent of the house value. The interest charge on an equity release product can be up to 2 per cent higher than the charge on a normal mortgage. Although the UK and US markets are more developed than in other countries there is thought to be a lack of competition in these markets, which adversely impacts on transaction costs (CFPB, 2012). Fox O'Mahony and Overton (2015b) view transactions costs as impeding the uptake of equity release plans, but also consider product complexity and limited product innovation to be equally problematic.

3 Data and Methods

3.1 Data

The data used in this study comes from waves one to four of the Wealth and Assets Survey (WAS) for Great Britain. The WAS is a longitudinal panel study of private households and is designed to be nationally representative. Wave one commenced in July 2006 with fieldwork spread over the following two years, and achieved a sample of 30,511 households. Interviews for subsequent waves were then conducted at two-yearly intervals and all interviews for wave four were completed by July 2014. The survey gathers data on the economic well-being of households including the level of assets, savings, and debt; saving for retirement; how wealth is distributed among households or individuals; and factors that affect financial planning. Uniquely, a module on equity release schemes is also included where the respondent is asked their motivation for using this form of HEW

as well as the type of scheme and the amount withdrawn.

3.2 Motivating the analysis

To motivate our analysis of the role of housing assets in sustaining livelihoods in retirement, we first examine pre-retirement saving in the first wave of the survey (figure 1). We see that in all GB regions, property wealth and pension wealth were the main household assets with the more liquid financial and physical assets typically constituting only around 13 per cent of total household wealth. In particular, property wealth was greater than pension wealth in all parts of GB. In London, the South East, and South West, property wealth was around 80 per cent larger than pension wealth, whereas property wealth values were over double the value of private pensions in Wales. The regional variation in property assets was not reflected in regional levels of perceived retirement income adequacy. Consistently across the country, over one-third of all pre-retirees were not confident that their retirement incomes would provide them with an adequate standard of living. Despite the fact that property wealth in London and the South East was almost twice as large as in the North East, North West, Wales, and Scotland, the percentage of households who felt their retirement income would be inadequate was almost the same.

But it is not the case that households disregard housing assets in retirement planning. Pre-retirees in this survey were also asked their expected sources of retirement income (figure 2). The percentage of pre-retirement households reporting that they would downsize or borrow against the value of their home was generally very high but was almost inversely related to regional median property wealth. Higher proportions in the North East (77 per cent), Yorkshire and the Humber (51 per cent), West Midlands (43 per cent) and Scotland (46 per cent) expected to downsize than in London (40 per cent). Also, the proportions expecting to borrow against the value of their home were among the lowest in regions with the highest median property wealth – London (14 per cent) and the South East (14 per cent).

However, in practice very few people use their homes in this way. In figure 3, we examine the proportions of retired heads of household in wave one who state they have

ever used equity release. We see that the highest proportions actually taking out equity release plans are in the East, London, and the South East, confirming the North–South differences reported elsewhere (Key Retirement, 2017). Also, the actual levels of equity release are very low compared to what we would expect from the stated intentions of pre-retirement households in the previous figure.

In the next subsection, we aim to understand these patterns. We use the nested logit framework to understand how regional variations in house values, financial circumstances, and financial characteristics explain the decision to downsize or take out an equity release scheme (referred to collectively as 'withdrawing housing equity'). Also, we test for any residual regional effects which could be attributed to spatial differences in access to financial services or ecological effects not captured by our model. Our model also allows us to explore the influence of these variables on the overall low level of HEW in our sample.

3.3 Theoretical framework and model specification

In our main analysis, we use a nested logit model to understand the decision to withdraw housing equity and the form of HEW used.

Each head of household labelled i chooses from the following set of alternatives: she can decide to not use HEW (*NoHEW*); she can decide to informally withdraw housing equity by *Downsizing*; or she can decide to formally withdraw housing equity by purchasing an *Equity Release* product. These choices are partitioned into two nests where $B_1 = \{NoHEW\}$ and $B_2 = \{Downsizing, EquityRelease\}$. The utility that she obtains from choice j can then be decomposed as

$$U_{ij} = W_{ik} + Y_{ij} + \epsilon_{ij} \qquad [1]$$

for $j \in B_k$ and $k \in \{1, 2\}$, where

- W_{ik} depends only on individual-specific variables that describe the choice of nest k.
- Y_{ij} depends only on variables that describe the choice of alternative j. These variables are alternative-specific for each individual.

P_{ij}, the probability of choosing alternative j, is the product of P_{iB_k}, the probability of choosing nest k, and $P_{ij|B_k}$, the conditional probability of choosing alternative j given that nest k has been chosen. The alternative-specific variables also enter as explanatory variables in the choice of nest through the quantity I_{ik}, known as the *inclusive value* (Train, 2009). Letting $W_{ik} = w_{ik}\gamma$ and $Y_{ij} = x_{ij}\beta$, we have

$$P_{ij} = P_{iB_k} \times P_{ij|B_k} = \frac{e^{w_{ik}\gamma + \lambda_k I_{ik}}}{\sum_{\imath=1}^{K} e^{w_{i\imath}\gamma + \lambda_\imath I_{i\imath}}} \times \frac{e^{x_{ij}\beta/\lambda_k}}{\sum_{\jmath \in B_k} e^{x_{ij}\beta/\lambda_k}} \text{where } I_{ik} = ln \sum_{\jmath \in B_k} e^{x_{i\jmath}\beta/\lambda_k} \quad [2]$$

The set w_{ik} comprises indicators of financial need as well as measures of wealth and assets. We examine whether geographical differences in attitudes to risk and perceived knowledge also help to explain HEW behaviour. We have some direct measures of these characteristics for heads of households. The set w_{ik} then additionally includes indicators of household financial characteristics.

The different methods of HEW are distinguished by the amount the household can release by each method and the cost the household faces for using each method. The set x_{ij} then comprises estimates of the amount and cost associated with downsizing and equity release for each household.

3.4 Defining downsizing and equity release

We define our *downsizing* variable as homeowners who move to a lower value house between consecutive waves. Homeowners are those owning their address outright, or buying it with the help of a mortgage, or paying part rent and part mortgage. Those moving address from one wave to the next are identified in the survey but only those households whose new home has a lower value than their previous home or who move to rental accommodation are regarded as downsizing.

Those raising money through *equity release* in waves two to four are identified from a response of 'yes' to: 'It is possible to raise money for retirement based on the value of your home through an arrangement known as equity release. Have you or your partner

raised any income or capital from the value of your current home?'.

3.5 Individual-specific variables

Our first set of individual-specific explanatory variables describe the financial situation of the household. The *debt-to-income* ratio is the ratio of all household financial liabilities to household income including arrears on consumer credit and household bills as well as non-mortgage borrowing. The *debt burden* variable indicates whether the household considers the repayments and interest on credit, loans, and arrears to be a financial burden. The *loan-to-value* is the ratio of the value of all mortgages to the sum of all property values . *No money left over* indicates whether the household hardly ever or never had money left over at the end of the week or month in the previous year. We include a number of measures of household wealth : the value of contents of the main residence and any other property of a household (*physical wealth*), the value of formal and informal financial assets net of any financial liabilities (*net financial wealth*), and the value of all pensions that are not state basic retirement or state earnings related (*pension wealth*). The fixed costs for each method of withdrawing housing equity apply to all households and as a result lower *household income* would be expected to lower the likelihood of withdrawing housing equity although higher incomes could imply less financial need. In our analysis, we incorporate house value and regional house price inflation by constructing a bequest variable. The amount available to bequeath will be the value of the house at the year of death.[5] Year of death was calculated using expectation of life by age, gender and country from 2007–09 life tables (ONS, 2017). The longer expectation of life was taken when the homeowners were a couple. Projected house value at this time was estimated using forecasts of regional house inflation. The forecasting methodology is explained in detail in Appendix 1. The bequest amount at time of death for each choice is then discounted to the present using a discount rate of 7.65 per cent, following the methodology outlined

[5]The implicit assumption is that there is nothing to bequeath if the homeowner withdraws housing equity. This is plausible if the homeowner downsizes by renting or if the amount owed on an equity release product is greater than or equal the house value at time of death.

in Bracke et al. (2016).[6]

Our second set of explanatory variables describe the financial characteristics of the head of household. We include indicator variables to capture whether the head of household agrees with a number of statements on planning for the future: *Buy things when can't afford*, *Buy things on credit* and *More of a saver than a spender*. We include an indicator variable *Poor mathematical skills* for whether the head of household self-rates their mathematical skills for daily life as poor. *Trust financial institutions* is an indicator variable for whether the head of household trusts banks, building societies, or insurance companies for advice about saving for retirement.

Our final set of explanatory variables are control variables plausibly associated with HEW. As with more liquid assets, we would expect all forms of HEW to be more likely at older ages, as older households decumulate assets to maintain consumption. We also include other household demographic variables as taste shifters. In addition, we test the ability of our model to capture all regional variations in HEW using dummy variables for government office region.

All explanatory variables are taken from wave one data.

3.6 Alternative-specific variables

We create two alternative-specific variables for choosing between no HEW and downsizing or equity release: (a) potential amount raised by the choice and (b) cost of the choice.

(a) *Amount*: If the household wishes to withdraw housing equity by downsizing to a smaller home then it will gain the difference between the value of its current home and a smaller suitable home. Champion (2005) finds that three-quarters of retired people who change address find a home within 50km of their previous address. The transition to retirement may involve longer-distance moves, but even among those aged 55–64

[6]Bracke et al. (2016) find that housing has implied discount rates with a declining time schedule. For the 2004-2008 Q3 period, gross discount rates were between 2.5 per cent and 6 per cent for terms less than 25 years. Taking the middle of this range and factoring in nominal rental growth of 3.4 per cent using actual rents for housing (series D7CE) from the UK Office of National Statistics for Q2 2007 to Q2 2008 we get a net discount rate of 7.65 per cent. We use nominal rental growth as house prices are inflated in nominal terms.

only 7.4 per cent move over 200km.[7] Also, Leach (2012) found that few couples aged between 65 and 75 move to properties with fewer than three bedrooms due to the need to accommodate visiting relatives and the need to have some independence from each other. The amount potentially released by downsizing is then the maximum of the difference between the value of their current home and the price of a three-bedroomed house at the fifth percentile in their government office region of residence and zero. All households whose potential gain from downsizing is zero are excluded from the sample.

If the household wishes to withdraw housing equity through an equity release product then the potential amount drawn down will be a proportion of their house value and this proportion will depend on the homeowner's age. In 2016, the average loan-to-value (LTV) for both drawdown and lump sum plans was 27 per cent (ERC, 2017a) while in 2014 the overall average LTV was 23 per cent (ERC, 2014). Depending on the age of the youngest homeowner, LTV can typically vary from 20.5 per cent at age 55 to 52 per cent at age 90 (TFC, 2017).[8] The amount potentially released by equity release is then the proportion of the house value determined by the age of the youngest homeowner. As low value properties are ineligible for these plans, the amount potentially released by equity release was set to zero for houses with values less than the current threshold of £70,000 discounted to 2008 using the UK Consumer Prices Index (CPIH). All households in such low value properties were excluded from the sample.

(b) *Cost*: The major upfront costs in downsizing include stamp duty on buying the new home, mortgage lender valuation fee, surveyor fee, legal fees, fee for electronically transferring mortgage money from the lender to the solicitor, estate agent fee for selling existing property, and removal costs. The stamp duty payable on a three-

[7]Similarly, Banks et al. (2012) find that 80% of homeowners over 50 years of age who move stay within their region of residence and Leach (2012) report that those who downsized tended to move to a smaller property within the same area.

[8]The relationship with age given by TFC Homeloans, an ERS broker, was validated by cross-referencing with equity release calculators provided by two established providers: Hodge Lifetime (available at `www.hodgelifetime.co.uk/equity_release_calculators`) and Aviva (available at `www.aviva.co.uk/equity-release/#calculator`).

bedroomed house at the fifth percentile in their current government office region of residence is calculated from rates pertaining in 2008–09 (HMRC, 2017). The estate agent's fee was calculated at 3 per cent of house value plus 20 per cent VAT. All other costs were calculated based on 2017 costs estimated by the Money Advice Service, which were then discounted to 2008 using CPIH (MAS, 2017).

Costs in setting up an equity release scheme include administration fees, solicitor fees, and surveyor fees and are typically in the range of £2,000 to £3,000 in total depending on the amount released and the plan being arranged (ERC, 2017b). A cost of £3,000 discounted to 2008 using CPIH was assumed to apply to all households.

In the event of not withdrawing housing equity, the potential amount raised and the potential cost are obviously zero.

4 Descriptive statistics

In our analysis, we focus on the subsample of homeowners aged over 55 years either retired in wave one or retiring in subsequent waves.[9]

Descriptive statistics are provided in table 1 for the subsamples of households who downsize or take out equity release plans and for the entire sample. It can be seen that these subsamples are generally distinct from the overall population in similar ways. Households who proceed to withdraw housing equity by downsizing or equity release in waves two to four are generally in worse financial circumstances than the sample as a whole in wave one. For example, the unsecured debt-to-income ratio is 28 per cent for households subsequently downsizing, and higher again at 47 per cent for households subsequently using equity release plans, compared to 7 per cent for all households in the sample. The other measures of financial difficulties – debt burden, LTV and no money left over – also suggest an economic motivation for HEW. Levels of wealth also tend to be lower among these two groups, especially for households purchasing equity release products. In particular, net financial wealth – savings and other financial assets –

[9]A home-owner is required to be aged 55 and over to qualify for the most common equity release product: the Lifetime Mortgage.

for households subsequently downsizing and using equity release is £75,000 and £33,000 respectively compared to £110,000 for the whole sample. The present value of the average amount available for *bequest* at expected year of death is lower for those downsizing and using equity release than the overall population.

Heads of households downsizing or using equity release appear to be more impulsive than average as seen from the relatively high percentages stating that they *buy things they can't afford* and *buy things on credit*. There is no clear difference in *mathematical skills* between heads of households withdrawing housing equity and the general sample but they *trust financial institutions* slightly less.

The low levels of HEW in our sample are striking. Only 137 households downsize and only 129 households use equity release plans out of a sample of 8,136 over the six years covered by waves two to four. To an extent, this is driven by the high rates of attrition over time in our sample, and rates would be higher with more complete data (see next section). There are few estimates of the number of elderly households downsizing in the UK, but previous research demonstrates that the availability of suitable properties and the financial cost of moving are significant barriers to downsizing (Maxwell and Sodha, 2006; Pannell et al., 2012). The English Housing Survey indicates that elderly homeowners are generally less likely to move and that there was a particularly large reduction in house moving post-financial crisis (EHS, 2010).[10] Similarly, we would expect a low level of equity release. The market for equity release products in the UK is regarded as being small and under-developed constituting only half a per cent of the total mortgage market (O'Mahony and Overton, 2015).

The potential *amount* households could withdraw by downsizing is greater than by using an equity release plan (£147,400 vs £89,400) although the *cost* is generally higher (£11,400 vs £2,500).

[10]Data for 2009–10 in Table FA2301 of the English Housing Survey indicates there were 10,056,000 households where the household reference person was aged 45 and over, while Table FA4141 indicates that 133,000 of these were resident for less than a year (1.3 per cent). A subset of these households will have downsized.

5 Empirical results

5.1 Imputation

Attrition is an issue in the WAS just as it is in all longitudinal surveys. Of the 8,136 households in our dataset, only 6,066 are interviewed again in wave two while 3,695 are interviewed in all waves. While all our explanatory variables are taken from wave one, our downsizing and equity release dependent variables are formed from responses to questions in subsequent waves. Multiple imputation (MI) was used to account for missing data in these categorical variables under the assumption that the data are missing at random conditional on observed data. In MI, multiple datasets are generated with imputed values, using a sequence of univariate models. Parameter estimates are then combined across these datasets with standard errors adjusted for variability due to missing data (Schafer, 1997). Multiple imputation suffers from less parameter estimate bias, provides superior statistical power and takes better account of missing data sampling variability than case-wise deletion or alternative missing data approaches (Janssen et al., 2010). The MI model was estimated iteratively using chained equations where all variables except the one being imputed are included in the prediction equations (Royston et al., 2009). The imputation models also included all wave one variables used in the analysis in addition to a number of auxiliary variables associated with socio-demographics, housing and health. In order to yield sufficient statistical power, 30 imputations were carried out.

5.2 Modelling housing equity withdrawal

The results of our nested logit regression analysis are presented in table 2. From the results in column 1, we see that economic reasons explain some of the motivation to withdraw housing equity and that, in particular, households in straitened financial circumstances are more inclined to resort to drawing down their housing wealth. Higher levels of unsecured debt-to-income make it more likely that households will liquidate housing assets and this effect is even greater when debt is considered a financial burden. The LTV ratio is statistically insignificant indicating that increasing demand for HEW,

due to maturing interest-only mortgages, is a more recent phenomenon. The positive coefficient on households with no money left over at the end of their budgeting period also adds to the impression that HEW is often driven by necessity. The negative signs on other non-housing wealth measures indicate that these reserves help reduce this need, but none of these coefficients are statistically significant. Housing equity withdrawal is more likely for households with high incomes due to the high associated fixed costs (Banks et al., 2010). The negative sign on the bequest variable indicates that, *ceteris paribus*, homeowners in regions with high house price inflation will have lower levels of HEW as liquidating property wealth reduces the amount available to bequeath.[11] However, the coefficient estimate on the bequest variable is statistically insignificant.

The next estimates focus on the degree to which differences in attitudes to risk and perceived knowledge help to explain HEW behaviour. We see that heads of households who are more present-biased are more likely to withdraw housing equity, thus reducing their financial buffer against negative economic shocks (Benito, 2007). The coefficient on buying things on credit is positively signed, while being more of a saver than a spender is negatively signed. Mathematical skills, on the other hand, do not significantly impact on this decision, which is perhaps explained by the availability of independent financial advice. Trust in banks, building societies, and insurance companies for advice about retirement saving has a negative sign indicating that trust lessens the probability of HEW, although this estimate is not statistically significant.

Coefficient estimates for the alternative-specific variables explain the choice of the form of HEW – downsizing or equity release. The positive coefficient on the amount raised by HEW indicates that households will choose the method which allows them to release the most housing equity. Downsizing will therefore be more common for households whose house value is high relative to regional house values while equity release will be more common for older homeowners who are permitted to release a higher percentage of their

[11]Regarding a house as just another asset, an increase on its rate of return will have a substitution effect and an income effect (Deaton, 1992). The substitution effect will make consumption of housing equity more attractive in the future to the homeowners' heirs, reducing housing equity withdrawal now, while the income effect will mean less housing equity needs to be preserved to satisfy a given amount of future consumption by the heirs encouraging housing equity withdrawal now. It is not clear theoretically which effect should dominate.

house value. The negative coefficient on cost indicates that households are deterred by the relative expense of the particular form of HEW. Best and Kleven (2017) highlight how responsive the UK housing market behaviour is to transaction taxes and Leach (2012) reports that the elderly find stamp duty to be a significant impediment to moving home. Downsizing costs vary according to the values of the house being sold and the house being bought, whereas there is little variation in the costs of setting up an equity release plan.

As seen in equation [2], the alternative-specific variables, amount, and cost, also help explain the choice of HEW through the inclusive value. Regions with higher house values will therefore have higher levels of HEW. Also, market developments which allowed more housing equity to be withdrawn or which reduced costs would encourage more households to use their home in this way. We include a constant to capture the disutility of HEW unaccounted for by the set of explanatory variables. In the case of downsizing, this disutility includes the emotional attachment to homes and neighbourhoods, the nuisance of moving house, and the loss of social esteem which may accompany moving to a smaller property (Beach, 2016). In the case of equity release, this disutility includes the stigma of no longer being a homeowner and the negative image of equity release (Fox O'Mahony and Overton, 2015a). The coefficient estimate given in column 1 indicates that this constant is signed negatively as expected but not statistically significant.

In our second set of estimates, we include an indicator variable for all regions outside of London and the South East to test whether we have accounted for all geographical variation (column 2). Coefficient estimates for the household-specific variables are largely unchanged and the estimate for the dummy variable is statistically insignificant. In column 3, dummies are included for all regions where London is the baseline reference region. Coefficient estimates are similar to the previous models and none of the regional dummies are statistically significant. A joint test for the exclusion of all regional dummies was accepted for each of the 30 imputations. Our conclusion therefore is that the model in (1) explains all regional variation.

Our results would indicate that regional variation in HEW is associated with regional variations in household circumstances, household financial characteristics, and house val-

ues. A number of studies have found that financial characteristics vary across UK regions: attitudes to retirement saving have been shown to have geographical differences that are more complex than a simple North–South divide (Strauss and Clark, 2010); financial knowledge has been found to be particularly low in both London and the North while those in the Midlands and the South were more risk-averse in making retirement decisions (Clery et al., 2007); and people living in the West Midlands have better organized money management while living in the East of England is associated with scoring poorly at staying informed about changes in the wider economy (Finney and Hayes, 2015). In our analysis, measures of impulsivity are found to be positively associated with HEW and contribute to an impression that a lack of long-term planning leads to HEW. Over the 2008 Q2 to 2014 Q1 period, London and the South East experienced high house price inflation while house prices in the rest of the country stagnated.[12] Once we account for high house values in these areas, regional variation in financial characteristics and regional variations in the degree of financial hardship the household is facing, spatial differences in housing equity behaviour largely disappear. There therefore appears to be no evidence for an effect due to the uneven provision of banking services or an effect of different regional financial ecologies on HEW behaviour.

5.3 Housing equity withdrawal, inadequate pensions and regional economies

In this last subsection, we consider the impact HEW could have on retiree wealth and to regional economies. Estimates are given in table 3 of the potential benefits retired households could gain from downsizing or equity release. From column 2, we see home-ownership rates vary across GB regions with generally higher rates in the South except for London. If we assume as before that retired households can move to a three-bedroomed property with a value at the fifth percentile for their region, then we can compute the

[12]House price inflation (HPI) was 27 per cent in London, 7 per cent in the South East and 4 per cent in the East. In all other regions, HPI was at most 1 per cent and was negative in many regions. Authors' calculations based on UK Office for National Statistics Table 14 Mix-adjusted house price index by region `https://www.gov.uk/government/collections/uk-house-price-index-reports`.

percentage of households that can avail of downsizing (column 3). Median values for the amount released under this assumption and the impact this would have on households' wealth are given in columns 4 and 5. There is a large variation in the median amount released across regions with the amount for the South East almost double that in Scotland or the North East. A similar pattern emerges even when we scale these amounts by pension wealth. The amount released by downsizing is as large as the household private pension pot in the South, while only half as large in the North East and Scotland. The calculations are then repeated for equity release resulting in similar conclusions (columns 7–9). Equity release will make most difference to households in the South and London where the amount released is almost as large as the private pension pot, and the least difference to households in Scotland and the North East (column 9).

Releasing housing equity can therefore make a significant difference to welfare in retirement for homeowners with adequately sized properties almost doubling private pension wealth in many regions. Saving for retirement using housing cannot replace retirement planning by pensions and investments but could ease financial needs in old age. With longer lives and increasing difficulties in meeting the costs of social care from public finances, policies to encourage releasing housing equity have significant potential to provide a better quality of life in old age for the majority of retirees in all regions. Such polices would be particularly beneficial in the South where they could have the greatest impact on provision for later life and could help ease housing shortages.[13]

We also estimate the impact on regional economies if all those eligible in wave one proceeded to withdraw housing equity. It is not clear that all of the proceeds would be spent and contribute to the local economy. While the housing equity withdrawn is often spent on house maintenance, home improvement, holidays, everyday expenses, and health care needs, many homeowners reinvest the proceeds or pay down debts (Leach, 2012; O'Mahony and Overton, 2015). We follow Hurst and Stafford (2004) in estimating

[13]It should be noted that entitlement to state pension benefits is not included in these pension wealth calculations and will be more or less uniform across all regions. Therefore the actual contribution to household pension resources will be less than given here. In order to roughly quantify how our results would change, we take median state pension wealth from Banks et al. (2005) as £72,173. Applying this uniformly across our sample would reduce the GB ratio of amount/pension wealth from 0.84 to 0.54 for downsizing in column 5 and from 0.68 to 0.44 for equity release in column 9.

the average propensity to consume home equity (APCE). As in the survey used in their study, the WAS does not include direct measures of consumption. Instead, we follow these authors in examining changes in assets (including property) from wave one to wave four, $\Delta A_{1,4}$, as a result of withdrawing housing equity using the model below.

$$\Delta A_{1,4} = \gamma \mathbb{1}_{hew} e_{1,4} + \alpha A_1 + \beta Y_{1,4} + \delta' \mathbf{\Theta_1} + \varepsilon_{1,4} \quad [3]$$

where $\mathbb{1}_{hew}$ is an indicator variable which is one if the household withdraws housing equity in waves two to four and zero otherwise ; the amount released by HEW is $e_{1,4}$; A_1 is assets in wave 1; $Y_{1,4}$ is household income in waves one to four; and $\mathbf{\Theta_1}$ is a vector of household characteristics including region, head of household gender, age, education, and marital status as well as the number of children in the household from wave one.

The intuition is that there will be no change in assets (the sum of physical, net financial, and property wealth) for households who reinvest all the proceeds of HEW in another asset in their portfolio and therefore for these households $\gamma = 0$. If all of the proceeds are consumed then the sum of assets will change by the same amount as that released by HEW and for these households $\gamma = -1$. The coefficient γ then measures the propensity to consume housing equity withdrawn averaged across all households. Physical, net financial, and property wealth in wave one enter as separate explanatory variables in A_1 to account for differential rates of return on these different assets. Estimates of the APCE are given in table 4 with all other coefficients suppressed for an OLS regression analysis of equation [3]. Coefficients are very similar for both forms of HEW indicating that roughly four-fifths of housing wealth withdrawn was used by the household for consumption.

We then return to table 3 and estimate the potential effect of HEW on each region's economy. To estimate the number of households that could withdraw housing equity, we multiply 2011 Census figures for the number of retired households in each region by the proportion who could withdraw housing equity (columns 3 and 7 in table 3). Assuming that each of these households withdraws the median amount (columns 4 and 8), we can estimate the total amount of money potentially released if all eligible households withdrew housing equity. Applying estimates of the APCE to this amount gives the total amount

spent on consumption in each region. These figures are then divided by the GVA in each region in columns 6 and 10 to determine the relative effect on the regional economy i.e.

$$\frac{\text{Total amount}}{\text{GVA}} = \frac{\text{Retired households} \times \text{Per cent eligible} \times \text{Median amount} \times \text{APCE}}{\text{GVA}} \quad [4]$$

We see from the results in columns 6 and 10 that the economic effects are very large in all regions. If every eligible retired homeowner proceeded to downsize and spend the proportion of the housing equity released indicated by the APCE in their regional economy then this would provide a one-off boost to the economies of the South East, South West, and Wales of around one-third of annual GVA. In most other regions, the additional spending would also be substantial, ranging from around one-sixth to one-quarter of GVA. The effect on the London economy would be smallest at 7 per cent despite having the highest house values in the UK. Repeating these estimates for equity release gives similar if slightly lower results. The economic impact would be largest in the South West at 27 per cent of GVA and lowest in London at 6 per cent.

6 Conclusion

With the move from defined benefit to defined contribution occupational pensions in the UK and doubts about the sustainability of the state pension system, preparedness for retirement is coming under increased policy scrutiny. Although housing wealth is often households' largest asset entering retirement and a large proportion of retirees regard their pension income as inadequate, few retiree households use their house to support their retirement in practice and the reasons for this are not well understood. This is particularly surprising in London and the South East where house values have increased rapidly over the last two decades. Data from the Wealth and Assets Survey show large regional variations in attitudes to withdrawing housing equity but low rates of actually withdrawing housing equity in practice. In this paper, we explain these regional variations and explore the economic consequences housing equity withdrawal could have

on pensioner households and regional economies.

The empirical analysis we have presented offers a number of original findings. First, we find that much of the spatial patterns in housing equity withdrawal can be explained by variations in house values, financial circumstances and the financial characteristics of the household. Housing equity withdrawal is seen to be prompted by financial difficulties with those households experiencing onerous debts and with little spare cash more likely to drawdown their housing wealth. Also, impulsivity as measured by a tendency to use credit to afford purchases and preferring spending to saving encourages housing equity withdrawal. Regions with high house values will have high levels of housing equity withdrawal as households in these areas can release a greater amount of equity. Our second contribution is the finding that the expected amount raised and the relative expense of downsizing compared to equity release help explain the choice between the forms of housing equity withdrawal. Third, we estimate the impact housing equity withdrawal could have on retiree wealth and to regional economies. We find that pension wealth would be increased by 84 per cent or 68 per cent for homeowners with adequately-sized properties downsizing or taking out an equity release plan. The one-off effects on the regional economy would also be substantial ranging from a boost of 6–7 per cent to gross value added in London to about an additional one-third of gross value added in the South East, South West, and Wales.

This is not to say that all eligible homeowners should be actively encouraged to use their homes to pay for their retirement. Ideally, retirees should have anticipated their financial needs and made adequate provision for old age. Also, many older people do not want to downsize as they are emotionally attached to their home and neighbourhood, and there is often a lack of suitable properties built specifically to cater for the needs of the older population (Beach, 2016). Equity release schemes, on the other hand, involve a sense of loss of ownership and these financial products are expensive with higher charges and interest rates than standard mortgage products (Fox O'Mahony and Overton, 2015a; FCA, 2016). However, housing equity withdrawal can make a positive difference to those dealing with unexpected shocks, in problem debt, or with high maintenance costs and

can provide financial freedom where pensions are inadequate for asset-rich but income-poor households (Fox O'Mahony and Overton, 2015b). This has been recognized by the House of Lords Select Committee on Public Service and Demographic Change who note that 'people with housing equity should be enabled to release it simply, without excessive charges or risk and that the Government should work with the financial services industry to ensure such mechanisms are available and to improve confidence in them' (Lords, 2013). Up till now, the equity release market has been neither competitive nor innovative, with the main providers and adviser networks pricing out smaller more innovative players (FCA, 2016), but equity release interest rates have been coming down faster than mortgage rates and new providers have recently entered the market (ERC, 2017a). Supply-side policy changes may also be imminent for downsizing with commentators as well as academics increasingly encouraging the government to assist downsizing by reducing stamp duty (Hilber and Lyytikinen, 2017). Demand for housing equity withdrawal is also likely to increase with mortgages sold on an interest-free or endowment basis coming to maturity over the coming years. More generally, the UK government continues to be concerned about under-saving for retirement and funding for social care despite a number of major recent policy initiatives (Treasury, 2016). It therefore will become increasingly important to understand the interaction between housing wealth and pensions, especially given the wide regional variations in house prices and attitudes to using housing as an asset to support retirement.

This work builds on earlier studies on occupational pension inequality, the distribution of pensioners' income and assets across UK regions, and the geographies of wealth, poverty and social exclusion (Leyshon et al., 2006; Clark and Knox-Hayes, 2007; Strauss and Clark, 2010). There have been few studies to date on the contribution of housing wealth to spatial inequalities in pensioner living standards and this paper goes some way towards filling this research gap.

Appendix 1

Forecasting house values

To forecast GB regional house price inflation, we use the factor-augmented vector autoregression model (FAVAR) developed by Bernanke et al. (2005). Das et al. (2010) find that FAVAR models outperform all other models in forecasting real house price growth rate for the nine census divisions of the US.

In this approach, a large set of macroeconomic time series are expressed as the sum of a small number of common components and an individual part specific to each variable. These common components are then used to forecast regional house price growth.

More precisely, our dataset consists of 24 quarterly UK economic time series observed from Q2 1990 to Q2 2008. The series were transformed to be stationary where necessary following standard practice (Stock and Watson, 2006). We extract a matrix of r common components F_t using principal components analysis such that for each time series x_{it}

$$x_{it} = \lambda_i F_t + \xi_{it}$$

where λ_i are the factor loadings and ξ_{it} are the idiosyncratic components. The number of common components r was determined using the Kaiser-Guttman rule (retain components with eigenvalue $\lambda > 1.0$) (Guttman, 1954). This rule is the most commonly used stopping criterion in principal components analysis (Jackson, 1993).

The factors F_t are then used in a vector autoregression to predict regional house price inflation y_{jt} for region j :

$$y_{j,t+h} = \alpha_0 + \alpha_1(L)'F_t + \alpha_2(L)'y_{jt} + \varepsilon_{j,t+h}$$

where h is the time horizon and L is the distributed lag operator. The number of lags was determined using the Akaike information criterion (AIC), Hannan-Quinn information criterion (HQIC), and Schwarz-Bayesian information criterion (SBIC). Where they differed, we favoured the SBIC with its heavier penalty for degrees of freedom lost, resulting in a simpler model (Greene, 2011).

Following Shao et al. (2015), the first three quarterly UK economic time series in our dataset were: UK Gross Domestic Product quarterly growth, the one-quarter zero coupon yield rate and the spread between the 5-year zero coupon quarterly average yield from British government securities and the one-quarter rate. The remaining 21 time series were Total Claimant Count (growth), Household final consumption expenditure (growth), Construction Index (growth), CPI Index (growth), Employment Rate (aged 16-64), Gross Fixed Capital Formation (growth), General Government expenditure (growth), Households expenditure (growth), Non-profit institutions serving households (growth), Total exports of goods and services (growth), Real household disposable income (growth), Household Saving Ratio, Total imports of goods and services (growth), Inactivity Rate (aged 16-64),Compensation of Employees (growth), Other Income (growth), Gross Operating Surplus (growth),Taxes less Subsidies (growth), Output per worker (growth), Public sector Net Borrowing, Unemployment Rate 16+, Input of all manufacturing Index (growth), Output of manufactured product Index (growth), Production Index (growth), RPIJ Index (growth), RPI Index (growth), RPIX Index excluding mortgage interest (growth), Retail Sales Value including automotive fuel (growth) and Services Index (growth).

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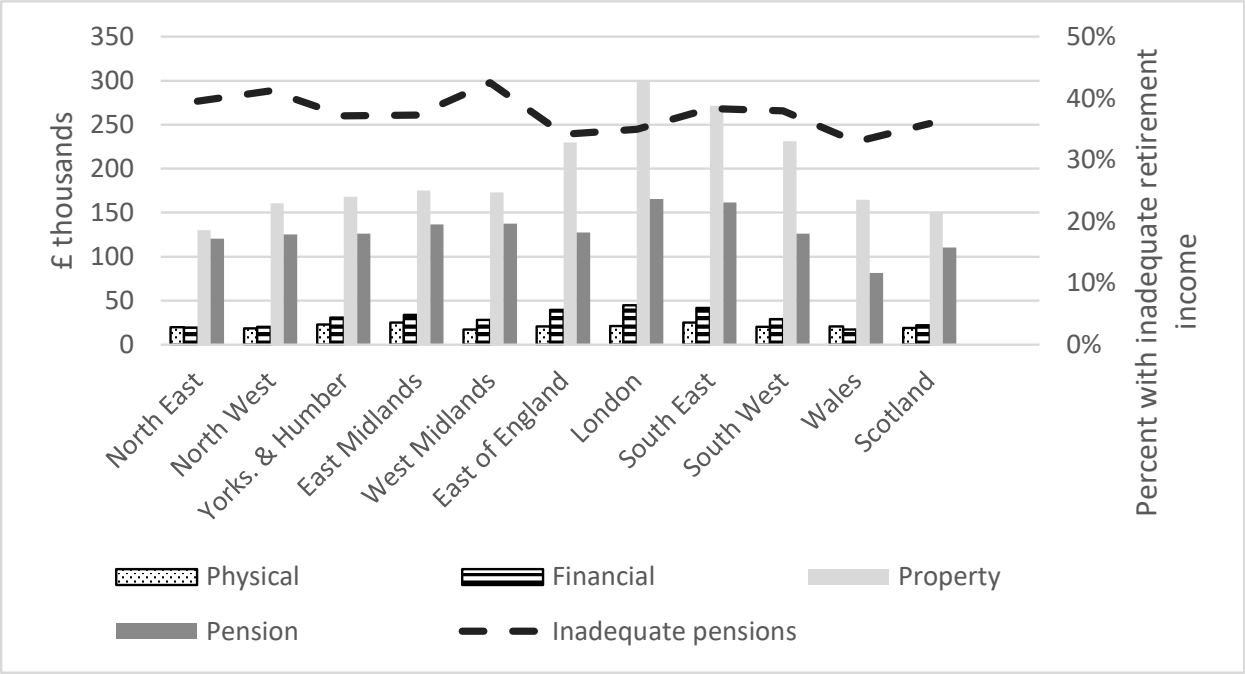
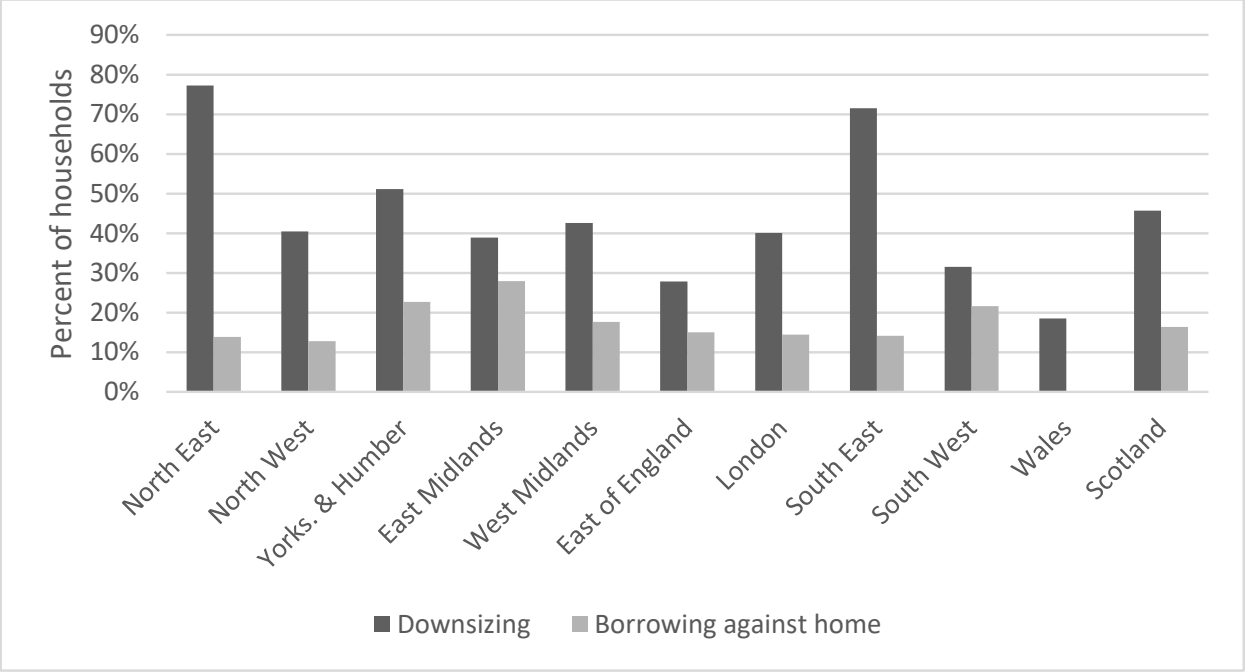
Figure 1: Median pre-retirement household wealth in wave one with levels of retirement income inadequacy



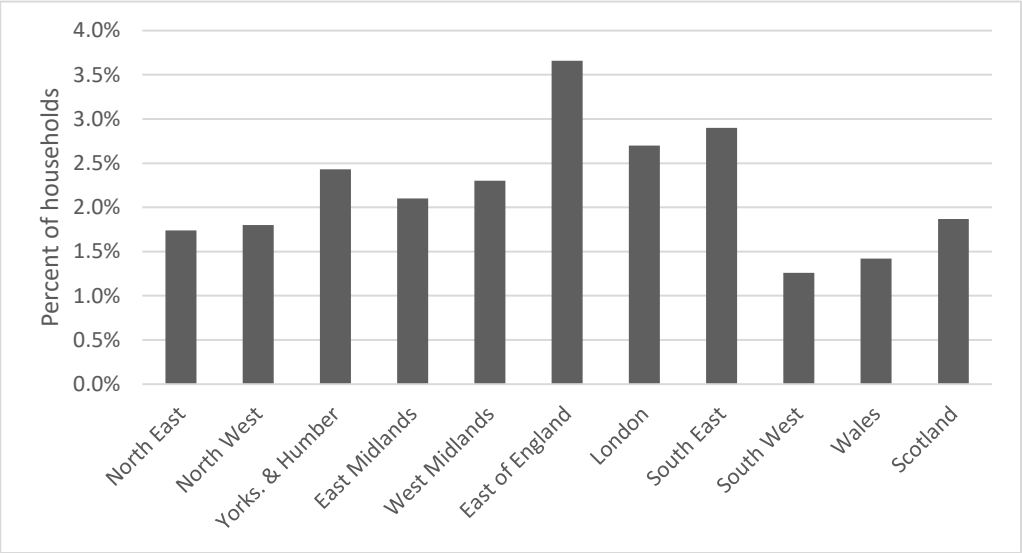
Note: Wave one was conducted July 2006 to June 2008. Sample is homeowners within ten years of state pension age and not retired in wave one. *Physical wealth* is the value of contents of the main residence and any other property of a household including collectables and valuables (such as antiques or artworks), vehicles and personalized number plates. *Financial wealth* is the value of formal and informal financial assets net of any financial liabilities. *Property wealth* is the value of any property privately owned in the UK or abroad net of any liabilities on the properties. *Pension wealth* is the value of all pensions that are not state basic retirement or state earnings related. Those responding 'not very confident' or 'not at all confident' to 'How confident are you that your [household] income in retirement will give you the standard of living you hope for?' are regarded as having *inadequate retirement income*.

Figure 2: Per cent of pre-retirement households in wave one expecting to use housing equity to provide money for retirement



Note: Responses of 'Downsizing/moving to a less expensive home' or 'Borrowing against the value of your home' to 'Which of the options on this card do you expect to use to provide money for your retirement?' Sample is homeowners within ten years of state pension age and not retired in wave one.

Figure 3: Per cent of retired heads of household in wave one ever using equity release.



Note : Sample is homeowners retired in wave one. *Equity release* is a response of 'yes' to 'It is possible to raise money for retirement based on the value of your home through an arrangement known as equity release. Have you (or your spouse/partner) ever raised any income or capital from the value of your current home (excluding any remortgage or top-up)?'.

Table 1: Descriptive statistics (means)

Household-specific variables	Downsized	Equity release	All
Debt-to-income ratio	0.28	0.47	0.07
Debt burden	0.16	0.19	0.07
Loan-to-value	0.08	0.13	0.03
No money left over	0.30	0.38	0.18
Physical wealth (£100k)	0.28	0.23	0.29
Net financial wealth (£100k)	0.75	0.33	1.10
Pension wealth (£100k)	1.80	1.53	2.56
Household income (£100k)	0.25	0.20	0.25
Bequest (£100k)	1.53	1.62	1.75
Buy things when can't afford	0.06	0.13	0.04
Buy things on credit	0.21	0.30	0.15
More of a saver than a spender	0.57	0.36	0.61
Poor mathematical skills	0.04	0.04	0.04
Trust financial institutions	0.10	0.16	0.17
Female head	0.39	0.32	0.36
Aged 65-74	0.48	0.53	0.39
Aged 75+	0.26	0.25	0.34
Retired	0.67	0.76	0.81
Number of children	0.01	0.01	0.02
Education degree or above	0.19	0.16	0.21
Has partner	0.56	0.59	0.59
Bad health	0.09	0.05	0.09
Partner bad health	0.06	0.05	0.04
N	137	129	8065

Alternative-specific variables	Downsizing	Equity release	No HEW
Amount (£100k)	1.47	0.89	0
Cost (£100k)	0.11	0.03	0
N	8065	8065	8065

Note: Means for wave one. The full sample is homeowners aged 55+ who are retired in wave one or who subsequently retire. *Individual-specific variables*: *Downsized* are households moving to a lower value house between consecutive waves. *Equity release* are households in waves two to four giving a response of 'yes' to 'It is possible to raise money for retirement based on the value of your home through an arrangement known as equity release. Have you or your partner raised any income or capital from the value of your current home?'. *Alternative-specific variables*: *Downsizing* assumes households can move to a three-bedroomed house at the fifth percentile in their government office region of residence. *Equity release* assumes households can take out an equity release plan under standard conditions. *No HEW* assumes households do not withdraw housing equity.

Table 2: Nested logit model of housing equity withdrawal

Dependent variable : Housing equity withdrawal		(1) Constant	(2) Constant + London/SE	(3) Constant + Regions
Household-specific variables	Debt-to-income ratio	0.175***	0.174***	0.180***
		(0.061)	(0.061)	(0.061)
	Debt burden	0.560***	0.560***	0.555***
		(0.197)	(0.197)	(0.196)
	Loan-to-value ratio	0.020	0.022	0.012
		(0.058)	(0.058)	(0.273)
	No money left over	0.488***	0.489***	0.501***
		(0.152)	(0.152)	(0.153)
	Physical wealth	-0.006	-0.006	-0.006
		(0.182)	(0.183)	(0.179)
	Net financial wealth	0.015	0.015	0.017
		(0.034)	(0.034)	(0.033)
	Pension wealth	-0.029	-0.029	-0.027
		(0.026)	(0.026)	(0.025)
	Household income	0.254**	0.251**	0.253**
		(0.113)	(0.113)	(0.120)
	Bequest	-0.043	-0.020	0.071
		(0.140)	(0.155)	(0.236)
	Buy things when can't afford	0.409	0.407	0.415
		(0.253)	(0.253)	(0.254)
	Buy things on credit	0.366**	0.366**	0.368**
		(0.164)	(0.164)	(0.165)
	More of a saver than a spender	-0.317**	-0.317**	-0.315**
		(0.136)	(0.136)	(0.137)
	Poor mathematical skills	0.235	0.238	0.242
		(0.313)	(0.313)	(0.311)
	Trust financial institutions	-0.149	-0.151	-0.147
		(0.183)	(0.183)	(0.184)
	Outside London & South East		0.081	
			(0.224)	
	North East			0.218
				(0.530)
	North West			0.057
				(0.541)
	Yorkshire & Humber			-0.107
				(0.568)
	East Midlands			0.232
				(0.550)
	West Midlands			-0.068
				(0.549)
	East			0.238
				(0.506)
	South East			0.044
				(0.438)

	South West			0.249
				(0.539)
	Wales			0.123
				(0.499)
	Scotland			-0.191
				(0.575)
	Constant	-47.587	-40.741	-69.313
		(362.560)	(234.934)	(315.925)
Alternative-	Amount	0.861**	0.762*	1.033*
specific		(0.383)	(0.457)	(0.606)
variables	Cost	-43.021**	-39.470**	-56.651**
		(17.292)	(19.310)	(26.840)
Average log likelihood		-1486.4	-1486.3	-1486.3
Average number withdrawing housing equity		319	319	319
Average number of cases		8065	8065	8065

Note: Dependent variable is a choice of no housing equity withdrawal (nest 1), downsizing or equity release (nest 2). Sample is homeowners aged 55+ retired in wave one or who subsequently retire. Additional controls include dummies for household head female, head aged 65–74, head aged 75+, head retired, head in bad or very bad health, partner in bad or very bad health, head has partner, as well as the number of children in the household. The log-sum coefficient for the first nest is constrained to one to account for its degenerate nature. Estimates are pooled from 30 imputations. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Potential benefits from housing equity withdrawal by region

		Downsizing				Equity release			
Government Office Region	Owner-ship rates	Per cent eligible	Median amount released	Median amount/ pension wealth	Total amount/ GVA	Per cent eligible	Median amount released	Median amount/ pension wealth	Total amount/ GVA
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
North East	64.4	59.7	85440	0.58	0.19	62.0	56000	0.50	0.13
North West	73.6	68.9	92000	0.82	0.21	72.3	63750	0.62	0.15
Yorks. & Hum.	68.8	64.8	94747	0.94	0.20	67.1	61600	0.66	0.13
East Midlands	75.9	70.8	93000	0.83	0.23	75.3	67600	0.69	0.17
West Midlands	77.3	70.5	98448	0.85	0.24	76.3	67550	0.68	0.17
East	80.2	73.9	120000	0.86	0.27	78.9	88625	0.70	0.21
London	68.1	60.9	125000	0.90	0.07	68.0	108921	0.91	0.06
South East	82.9	76.6	160000	0.96	0.32	81.6	103500	0.79	0.22
South West	81.1	75.0	130000	0.99	0.36	80.2	92500	0.82	0.27
Wales	80.0	75.3	103000	0.84	0.35	77.0	64350	0.60	0.22
Scotland	68.7	62.2	84778	0.57	0.16	65.2	52650	0.40	0.10
GB	75.4	69.6	110000	0.84	0.22	73.9	77500	0.68	0.15

Note: Sample is homeowners aged 55+ retired in wave one. *Eligible households* is the percentage of households who can avail of downsizing or equity release under given assumptions (columns 3 and 7). *Median amount released* is the median potential amount released by downsizing or equity release (columns 4 and 8). *Median amount/pension wealth* is the median of the potential amount released divided by total household pension wealth (columns 5 and 9). In columns 6 and 10, the number of households where the household representative person is retired and aged 50+ is taken from tables DC4601EW and DC4601SC in the 2011 Census and multiplied by (*Per cent eligible* × *Median amount released* × APCE) / *GVA*. Regional *GVA* is 2011 gross value added (income approach) at current basic prices (www.ons.gov.uk/economy/grossvalueaddedgva).

Table 4: Average propensity to convert home equity into consumption (APCE)

	Downsizing	Equity release
APCE (γ)	-0.801**	-0.777*
	(0.108)	(0.354)

Note: Sample is homeowners aged 55+ retired in wave one or who subsequently retire. The APCE is an estimate of γ in equation [3] for downsizing and equity release. Dependent variable is change in household wealth from wave one to wave four (including property wealth). As in Hurst and Stafford (2004), the top/bottom 1% of the change in wealth distribution were omitted. Additional controls include initial physical, net financial and property wealth; household income at each wave; dummies for government office region; household head female; head age; head education; head has partner as well as the number of children in the household. * $p < 0.05$, ** $p < 0.01$.