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HOUSINGCOSTS, HOUSE PRICE SHOCKS AND SAVINGS BEHAVIOUR AMONG OLDER HOUSEHOLDS IN BRITAIN

by

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1. INTRODUCTION

It is well known in the consumption literature that many households do not run down assets after retirement to the extent predicted by the stylised life cycle hypothesis of consumption (LCH) contained in intermediate-level textbooks.[1] There is evidence, too, that consumption falls sharply at or around retirement, slowing the subsequent decline in asset holdings (Banks, Blundell and Tanner, 1998). One reason may be that in a number of countries a significant proportion of non-pension wealth is typically held in the form of housing equity (owner occupation). Indeed housing equity is the dominant form of wealth of older households as pension wealth is run down.[2] However, housing is both an investment and a consumption good (Henderson and Ioannides, 1983), and it is difficult for households to separate these attributes in adjustments to housing stock (for example, by downsizing) after retirement. This is worsened by the presence of transaction costs, both financial and psychic, and the absence of well-functioning home equity release schemes. [3] As a consequence of these characteristics, many studies in fact show that the average value of housing wealth typically declines only slowly, and may indeed increase, after retirement (Merrill, 1984; Feinstein and McFadden, 1989; Venti and Wise, 1989, 1991; Sheiner and Weil, 1992).

Several policy issues arise in this context. If households are unable or unwilling to move in old age, their consumption behaviour may be constrained by asset illiquidity. This may induce risk averse households to reduce other forms of consumption expenditure. Illiquidity in housing wealth and/or high levels of both actual and psychic housing transactions costs may result in an accelerated decline in holdings of other more liquid financial assets. In the face of 'excess' consumption of housing (in the sense of retaining an excessively large house), older

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[1] Controversy stems from whether this fact is consistent with a strong bequest motive, or stems from erroneous aggregation in cross-sections in the presence of differential mortality within cohorts and differences in permanent income across cohorts; see inter alia Mirer(1979), Hurd (1987), Bernheim (1991) and Weil (1994). Miles (1999) has also recently argued that the mis-treatment of annuitised pension rights as income rather than dis-saving further distorts the picture of saving behaviour after retirement.

[2] For evidence on housing wealth in Great Britain, see Henley (1998), for Germany, see Stahl (1989) and, for comparisons of samples of OECD countries, Poterba (1994) and (OECD, 1998). The latter study suggests that housing wealth is the dominant form of non-pension wealth in all nine OECD countries surveyed.

owner-occupiers may defer property maintenance and underinsure their property with eventual consequences for the state and value of the private housing stock. And a combination of excess user costs of housing, low incomes in retirement and the depletion of other financial assets may impose excess burdens on the social security programme, especially where, as in the United Kingdom, there are specific cash benefits for help with housing costs for low income families. The importance of these policy issues can only be assessed by examining housing costs, moving behaviour and portfolio adjustment strategies of older households in practice. This is the purpose of the present paper.

It therefore examines the evidence concerning the consumption of housing by older households in Britain, and household tenure and portfolio strategies in the face of differential expenditures on housing by utilising the two waves of the British Retirement and Retirement Plans Survey, conducted in 1988-89 and 1994 (hereafter RS, and described in OPCS, 1992 and Disney, Grundy and Johnson, 1997). This survey, carried out by the Office of National Statistics (previously the Office of Population Censuses and Surveys), is a random sample of some 2500 households containing at least one person aged 55-69 in 1988-89. The survey contains information on a wide variety of socio-economic characteristics as well as evidence on housing tenure and costs, and on other wealth holdings. It also contains a full event history concerning labour market states, and a family history. Furthermore, the survey contains interesting questions concerning peoples' intentions and expectations about retirement, and concerning economic behaviour, including (dis)saving behaviour, since retirement.

A pertinent fact is that the first wave in 1988-89 coincided with the peak of a very inflationary boom in the British housing market and that the period between the two survey waves saw a very sharp housing market recession with a slight recovery in the last year or so. Between the peak of the market in the third quarter of 1989 to the fourth quarter of 1994 real average house prices for the UK fell by 30% (and by over 11% in nominal terms).[4] Furthermore, these price falls were uneven across the country, with the largest falls concentrated in London and

[3] For a model that explicitly incorporates heterogeneous preferences and moving costs, see Venti and Wise (1984). On reverse annuity mortgages and other housing equity release schemes, see Leather (1990) for the UK, and Rivlin and Weiner (1988) for the US.

[4] These figures are computed from the mix-adjusted house price series of the Halifax Building Society (now Halifax PLC), deflated by the UK consumer price index.

the South East, where the boom of the mid-1980s in asset values had been most pronounced; whereas in Northern England, Scotland and Wales real house prices were more stable. These falls had a number of effects on families in this age group. Whilst reducing the current value of household wealth, the general recession in the construction industry at that time may have reduced some housing costs, such as maintenance. As we shall show, the adverse price change also affected moving behaviour. In general, however, this period of turbulence is of particular interest in the context of corroborating those 'tests' of the life cycle hypothesis of saving and the failure of families to downsize housing equity in the other studies described previously. Combining all sources of wealth, it is easy to show apparent dissaving of wealth among elderly households in this British data over this period (Disney, Johnson and Stears, 1998). Although this is of course an artefact of falling nominal asset values, the same criticism might be levied in reverse of findings of accumulation of housing wealth by elderly households in periods of steadily rising house prices (relative to income).

This adverse house price shock has another indirect function. Although the tenor of the above argument is that many households headed by an elderly person may have experienced 'excessive' housing costs relative to their desired housing stock, we have no way of knowing directly whether high housing costs relative to income reflect heterogeneity of preferences across households or constraints on household portfolio reallocations. However, given the panel aspect of the data (albeit only two temporal observations), this house price 'shock' might in principle permit us to identify portfolio reactions to exogenous events which affect wealth components, in contrast to differences in behaviour arising from idiosyncratic tastes, assuming those tastes to be constant over the relatively short period of time between the two waves. We now discuss these issues more formally.

To draw together these strands, and in particular the link between the consumption and investment aspects of housing, the remainder of the paper is structured in the following way. Section 2 provides some data description, in particular of different forms of wealth holding. It then considers the consumption of housing services. In close approximation to Venti and Wise (1984), write down a model of housing consumption of the ith household in period t as:

$$H_{it} = \delta_{it} Y_{it}^{\alpha} + \varepsilon_{it}$$

(1)

where: H is the observed consumption of housing,

Y is some measure of income,

α is the income elasticity of housing consumption

ε is measurement error in measuring housing consumption

$\delta_{it} = \beta' X_{it} + \mu_{it}$; X is a vector of household characteristics and μ_{it} is an unobserved household taste shifter.

The optimal consumption of housing in period t, H^*_{it}, is not observed for two reasons: first because ε and η cannot be separately identified from a single wave of data, and second because the individual may not be in equilibrium, i.e. H_{it} „ H^*_{it}. Nevertheless, we can identify individuals that appear to have high values of housing consumption when conditioned on observables Y and X.

In Section 3 we examine the standard resolution of the problem of disequilibrium housing consumption (see, for example Ermisch and Jenkins, 1997), by testing a model of moving behaviour which links moves to changes over time in the optimal level of housing consumption and any existing disequilibrium. Write the model as:

- The individual moves if: $[H^*_{it} - H_{it-1}] > k(m_t)$ and therefore observed $H_{it} = H^*_{it} + \varepsilon_{it}$ where $k(m_t)$ is the cost of moving at time t, and:
- The individual does not move if: $[H^*_{it} - H_{it-1}] < k(m_t)$ and therefore observed $H_{it} = H_{it-1} + \varepsilon_{it}$.

We use this model to test whether there is evidence that the residuals, $\hat{e}_{it}$ from a prediction of H on observables Y and X correlate with the moving probability. As Venti and Wise (1984) suggest, if preferences and the moving function can be parameterised and (implicitly) ε_{it} is small, the distinction between movers and non-movers permits identification of the underlying model of optimal housing consumption.

In fact, in Section 3 we find no relationship between the moving probability and the measured residuals $\hat{e}_{it}$. This suggests several alternatives - of which two are that households are generally close to their equilibrium housing stock (i.e. that residual variation in housing consumption is unmeasured tastes) and/or that measurement errors e_{it} are large. There is, however, a third possibility that arises because this line of analysis abstracts from the investment (wealth) function of housing. This further possibility is considered in Section 4. It suggests that moving also involves a portfolio reallocation, permitting the household to obtain a more liquid portfolio if the house move generates a cash gain. However if a capital loss arises, where house prices are falling or transactions costs are large, the household may prefer to accept a disequilibrium in the short run in their consumption of housing. This, we argue, is precisely the circumstance that pertained in the period under consideration, when house prices fell substantially on average. Consequently activity in the housing market was very low, with older households preferring not to adjust their housing consumption by risking capital losses.

In such circumstances, there must be another equilibriating mechanism. Suppose we write down in general terms the optimal holding of wealth of a household as:

$$W^* = (FA^*+HA^*) = f(age, income, demographics, etc.) \tag{2}$$

where W is total wealth, FA is the value of financial assets and HA is the value of housing assets, with the asterisk indicating optimal values. Clearly if $W < W^*$ because $HA < HA^*$, then what are the alternatives open to the household? One is to cut consumption, just as windfalls in housing wealth may increase consumption.[5] A second alternative is to increase saving in financial assets to maintain wealth – temporarily the household becomes more liquid. We consider this option here in Section 4 by estimating a general model:

[5] . For evidence that consumption may be related to housing wealth, see in the US context Skinner (1989, 1993), Engelhardt (1996) and, for the UK, Acemoglu and Scott (1994), Miles (1992) and Bayoumi (1993). For evidence as to whether housing *windfalls* affect consumption, see the debate between Muellbauer and Murphy (1990) and Attanasio and Weber (1994).

$$\Delta FA_t = f[age, income, demographics, (HA^*_t - HA_{t-1} \mid prob(moving)t-1 \text{ to } t)] \tag{3}$$

Account has to be taken of the endogeneity of the moving decision and the shock to the value of housing wealth has also to be instrumented. The estimation procedure is discussed more fully in that section. The results suggest that exogenous changes in the value of housing wealth do affect the trajectory of financial assets, and that the residuals $\hat{e}_{it}$ also affect financial asset accumulation, albeit in a manner more compatible with an unmeasured taste 'story' than a disequilibrium model.

Finally, Section 5 summarises the main findings and concludes the discussion.

2. MEASUREMENT OF USER COST AND 'EXCESS' COSTS OF HOUSING

This section provides some preliminary descriptive evidence concerning holdings of both housing wealth and financial assets by age group at each wave of the Survey. It then constructs measures of housing consumption for home owners and renters. Of course, it is not possible to measure directly the flow of housing services provided to a homeowner although this would constitute the most appropriate measure of consumption of a durable asset. However one can measure expenditure on housing services and maintenance, and this measure of 'user cost' is a feasible one given data available in the Retirement Survey.[6]

Our basic unit of analysis, the household, is defined by the administrative concept of a 'benefit unit' in the United Kingdom, that is a single person or couple plus dependents. We focus only on households so defined where the head was aged between 55 and 69 in the 1988-89 wave of the survey, and who reported data in both waves of the survey. There is very strong evidence that attrition of the sample, both through death and non-response, is highly non-random. Survivors are more likely to be owner-occupiers, to own more valuable houses and to have larger holdings of financial assets (Disney, Johnson and Stears, 1998). Just under 1400 households which survived and provided all the requisite information are utilised in the ensuing analysis.

[6] Of course the possibility that optimal housing consumption and housing expenditure, as measured by user cost, are not identical, is implicit throughout.

Table 1 depicts predicted mean and median holdings of housing and financial wealth among households observed in both waves by age of head of household and tenure status in 1988-89 (all values are in January 1996 prices). Household housing wealth values are derived from banded information on house values provided by the respondents themselves. Predictions are then estimated using a grouped dependent variable (GDV) estimator.[7] There are a number of striking features to the table. Owner occupiers saw a sharp decrease in real housing wealth between 1988-89 and 1994 which was proportionately equal across age bands. This is wholly due to house price deflation dominating the offsetting effects of the net decline in the mortgage liability of households in this age range and the small number of owner occupiers in 1988-89 who moved to rented status between then and 1994 (see Table 2). The youngest age group had the largest value of housing wealth although this in part stems from the greater prevalence of couples among younger households. Among renters in 1988-89, the positive housing wealth values in 1994 arise from some transitions to owner occupation (again, see Table 2).

The later rows of the Table illustrate levels and changes in financial wealth among the households in 1988-89 and 1994.[8] In contrast to housing wealth, there are significant real increases in financial wealth among owner occupiers (again all values are in January 1996 prices), and wide variations in asset gains by age of head of household. Although the absolute increase in financial wealth is large, especially for the youngest age group, it does not compensate in monetary value for the fall in housing wealth. In stark contrast to owner

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[7] The GDV estimator treats each value of the banded variable as a latent variable within known limits, and finds a best prediction of that value given exogenous information and an assumed overall underlying distribution. The additional regressors comprised a quadratic in age, and gender, marital and employment status of the head of household, socio-economic group, regional dummies, and whether the property was connected to mains drainage and water supplies. The assumed underlying distribution is log-normal. The estimator is described in Stewart (1983), although here the estimates were obtained directly by Maximum Likelihood. For further details of the method used, see Disney, Grundy and Johnson (1997) and Disney, Johnson and Stears (1998). To move from a measure of house value to housing wealth, the value of outstanding mortgages was estimated and deducted from each household's calculated house value.

[8] The financial asset estimates were obtained by a similar procedure to those for household housing wealth. After aggregating individual reported assets to form an overlapping set of household asset bands, a GDV estimator was used. The additional regressors comprised information on individual assets held, an estimate of overall income from assets, and a similar set of household characteristics. After a certain amount of experimentation, it was found that a gamma distribution best fitted the overall distribution of the variable (in the sense that the predicted values of wealth were successfully located in the reported band). Further details are obtained in Disney, Johnson and Stears (1998).

occupiers, renters had very little financial wealth on average in 1988-89 and saw very little increase in its value to 1994. Given that renters typically have lower incomes, this provides further evidence that low income groups tend to move into retirement with very low financial assets (Hurd, 1987; special issue of *Journal of Human Resources*, 1995).

Our income measure for the household unit is defined as the sum of earnings, investment income, private pensions, social security and other income, aggregated up from the individual level. Welfare payments, including payments of Housing Benefit, council tax benefit (paid to offset local property taxes), rent and rate rebates and rent contributions from other individuals resident in the home are also included in gross income.[9] Our measure of the 'user cost' of housing is defined as the sum of mortgage payments, rates, water rates, maintenance and insurance costs, and other costs.[10] The maintenance costs are imputed to equal 1.0 percent of nominal house value. Insurance costs are assumed to be 0.25% of nominal house value in 1988-89 and 0.325% of house value in 1994, reflecting the relative increase in insurance costs to house values (because of static or falling nominal house prices) between the two periods. We define the ratio of out-of-pocket housing costs to current after-tax income as the predicted housing budget share (HBS).

Table 2 examines mean and median HBS in 1988-89 and 1994 for a variety of household types, separating those who stayed in the same house between waves from those who moved, and differentiated by whether they thereby changed tenure type. It reveals a number of interesting facts. First, HBS, as constructed here, for owners fell over the period, whereas HBS for renters rose sharply. This reduced HBS for owners arises for two reasons: the first is the fall in real house prices and the second is due to a minority of the sample paying off their mortgages between the two waves (18% of the sample had mortgages in 1988-89 compared to 11% in 1994). The rising HBS for renters represents growing rents, especially in the private sector as a result of deregulation in 1989. It also represents a sorting process by which the proportion of households living in publicly owned low-cost rented accommodation declined as a result of the continued 'right to buy' policy of successive Conservative

[9] There are two ways in which welfare payments for housing costs can be treated: either the way chosen here, or as income net of payments with the sum of payments also deducted from housing costs. Either is a consistent treatment of the problem of state support provided to low income renters and home owners.

[10] Other costs include service charges, ground rent, Scottish feu duty and compulsory maintenance charges.

administrations. This sorting process left the remaining public-sector renters as a lower relative income group, since higher income households were more likely to buy. Second, the number of transitions from owner occupation to rental status are low and indeed are exceeded by numbers in the reverse direction, in part because of the 'right-to-buy' policy. Third, there is little evidence from changes in mean HBS of 'downsizing', although the median HBS of owners who moved between the sample dates is slightly lower at the second interview. Finally, the average HBS for owners is very similar to the averages for the United States described by Feinstein and McFadden (1989, Table 2.4) although the incorporation of public transfers to low income households in the RS data causes the housing budget shares for renters to diverge from the US data.

Figure 1 plots the relationship in the RS data for 1988-89 between housing costs and household income, and between housing budget share (HBS) and household income for both homeowners and renters. For homeowners, the smoothed cubic spline relationship fitted to the cross-plot reveals a broadly positive and linear relationship between housing expenditure and current income, although it is apparent that HBS falls with income level. For renters, there is some evidence of non-linearity in the relationship between housing expenditure and current income. The bulk of the sample are at the lower end of the income distribution, where it is likely that renters of publicly-owned housing are concentrated. For this segment, the slope of the relationship between expenditure and income appears to be almost unitary. For higher income renters, the relationship between expenditure and income is less clear-cut. Thus, when considering the HBS-income relationship for renters, there is a high variance in ratios at lower incomes, whereas the ratio declines at higher income levels.

Finally, in this descriptive section, Table 3 predicts the log of household housing expenditure by owners and renters separately for 1988-89 for the sample who were also observed in 1994. Regressors including income, a quadratic in age, household characteristics, and region.[11] Not unexpectedly, current household income is highly significant with a coefficient of close to (but significantly less than) unity for renters and lower, but equally significant for owners. Married

male owners (the default categories) have larger housing expenditure than other household types whereas among renters, divorced people spend more on housing. Apart from the retired who spend proportionately more on housing (controlling for income), other categories of economic (in)activity appear to have mixed and largely insignificant effects on housing expenditure for renters. Among owners part-time employed, self-employed and the retired spend proportionately more on housing (although income may be understated among the self-employed). The regional dummies are jointly significant, the default region being the West Midlands. There is a good deal of regional variation in expenditures among owners, less so among renters.

As mentioned in the introduction, an important question is the extent to which households with high levels of housing expenditure, given income levels, are encumbered with 'unaffordable' housing or to what extent the observed variation in expenditure represents taste differences. Of course the data in Table 3 and Figure 1 can provide no direct answer to this question, although if we define a 'high' housing budget share as being above 0.4 then 6.9% of owner-occupiers and 9.8% of renters are above this threshold. Significant regional disparities may simply reflect differences in regional price indices and other household characteristics may be taste shifters. A natural test, however, provided by the two observations on each household in the panel, is to examine subsequent portfolio adjustments between the two waves in order to see whether these are associated with initial housing budget shares, having controlled for income and other covariates. This possibility is investigated in Sections 3 and 4.

3. MOBILITY, HOUSING COSTS AND HOUSEHOLD SHOCKS

This section examines the effect of housing expenditure and other variables on the decision to move home. The simplest presumption is that 'excess' housing budget shares conditioned on income are associated with a greater propensity to move, including possible changes in tenure status, in subsequent periods. Underpinning any analysis of moving behaviour are considerations of optimal tenure choice, as in Henderson and Ioannides (1983), in which moving costs affect the speed of adjustment towards the optimum from an existing

[11] To avoid compounding measurement error, given that the housing wealth used in calculating housing expenditure is a predicted variable, the set of regressors does not fully overlap those used in calculating housing *wealth.* In particular, household income is excluded from the variables used to construct housing wealth.

disequilibrium. Modelling strategies designed to estimate a model of optimal housing expenditure simultaneously with the moving decision where there are heterogeneous tastes are feasible, although difficult to implement. For example, Venti and Wise (1984) are able to recover the average value of transactions costs associated with moving by observing that ex post, movers should have eliminated any 'disequilibrium' from their optimal expenditure on housing. By parametrisation of preferences and the moving function, the underlying simultaneous model can be estimated.

Estimation of a quasi-structural model of this type is not the intention of this paper but the issue of simultaneity raised by such models is a pertinent one. The empirical strategy of this section takes account of the problem in the following way. The probability that a household moved between the two waves of the RS is conditioned on household characteristics in 1994, on events that affected households between 1988-89 and 1994 (which may or may not have been anticipated), as well as on 'disequilibrium' housing budget shares in 1988-89. If, due to heterogeneous preferences over housing and measurement error in the housing wealth variable, unexplained housing budget share does not uniquely identify 'disequilibrium', incorporation of other 'shocks' into an empirical model should cast some light on how differences in housing costs affect tenure decisions.

In this respect the fall in real house prices facing households over the period 1988-89 to 1994 is of potential significance. Arguably, owner-occupier households at later stages of the life-cycle increasingly treat housing as an investment good as opposed to purely a consumption expenditure. Releasing housing equity is a less attractive strategy in a market characterised by falling real house values than in a market with an upsurge of prices. Indeed the unwillingness of households to move at all is revealed in the data: as illustrated in Table 2, less than 1% of households moved from owner occupation into renting over the five year period and 7% in all moved.[12] In contrast, Ermisch and Jenkins (1997), using the British Household Panel Study,

[12] Those that did move reported an even greater reduction in housing equity, which may have arisen arise from explicit 'downsizing' of housing equity. However, given house values are self-reported for movers and non-movers alike, the decline may arise simply from a comparison of an over-inflated valuation with a market value, see Disney, Grundy and Johnson (1997). It is of interest that 182 individuals in the original 1988-89 sample reported that they intended to move house in the enxt five years in order to withdraw equity. Of this number, just over 40% reported the motive 'to make other investments' whereas almost all others reported as their motive some form of consumption decision.

found a rate of movement among households headed by a person aged 55 and over of 3.3% per annum between 1991 and 1995, which was overall a period of slow recovery in nominal house prices.[13] The decline in house prices relative to rents might also play a part in explaining the net flow from the rental sector into owner occupation.

Table 4 presents probit estimates of moving propensities for owners and renters in the RS sample observed in the two waves. The variables are of three types: (i) 'state' variables in 1994 comprising total household income, a quadratic in age and gender of the head of household and number of children; (ii) 'shocks' and other time varying household characteristics over the period 1988-89 to 1994 comprising the death of a spouse, various categories of retirement transition, inheriting property or receiving a lump sum from a private pension plan, an increase in disability, and the regional change in house prices over the period (source: UK Office for National Statistics); and (iii) the residuals from the predicted housing expenditure regressions in Table 3 (HBS), which, given the log-linear structure, capture the degree of unexplained housing budget share (conditional on income and the other controls) and thus potentially incorporate information about tastes, housing 'disequilibrium', or simply measurement error.

Columns (1) and (2) of Table 4 report regression for renters and owners separately. Given the small number of movers in the data, few coefficients in the regressions are significant. For renters the overall performance of the equation is particularly disappointing, with only a change in disability status even weakly associated with a higher probability of moving. For owners the equation is significant overall and the probability of moving is significantly and positively associated with household income, with inheriting property, the retirement of a spouse, and negatively with being female. Among owners, a disproportionate decrease in house prices over the period is associated with a lower probability of moving, but the coefficient is not significant; a higher HBS is associated with a lower probability of moving, although again not significant (and it is likely to be a by-product of the relationship between moving probability and income). Column (3) reports a specification variant for owners in

[13] There is a significant rate of attrition in the RS, not all of which is related to mortality (see Disney, Johnson and Stears, 1998). If moves are more likely to attrit, relative to, say, the BHPS, this would explain some of the discrepancy between the two surveys other than the different time periods involved.

which the HBS variable is replaced by dummy variables capturing which combination of above and below median income and above and below median housing wealth a particularly household enjoys. If housing 'disequilibrium' affects moving behaviour then we would expect households wealth to be less likely to move with high incomes and low housing (or conversely more likely to low incomes and high housing wealth). The results support the former, if not the latter of these, at a 6% level of statistical significance. Leaving aside the likelihood that moving behaviour is probably largely driven by preferences rather than observables in any event, the key element of the story, which is not testable without further observations of the cohort, is likely to have been that the fall in real house prices simply reduced the overall probability of moving within the time period.[14]

4. HOUSING WEALTH AND FINANCIAL ASSETS

Given that housing assets form an important component of the household's total wealth it is pertinent to examine the effects of housing market activity and 'disequilibrium', as described in sections 2 and 3, on the financial wealth component of our elderly households asset portfolio. Our presumption is that financial assets act as a buffer against any adverse economic shocks affecting the household. The immediate impact of an adverse shock may be to induce a depletion of financial assets to cushion the blow, but increases in the variance of prospective wealth should ultimately induce risk-averse households to engage in greater precautionary saving (Skinner 1989). Moreover, since Table 1 illustrated the enormous disparity in average financial wealth holdings between owner occupiers and renting households, it might be expected that the former are able to adjust asset positions to a greater degree in response to changes in the economic environment.

Again, an explicitly structural analysis of the problem might consider the joint determination of, say, financial and housing wealth. With endogenous retirement, the problem of identifying

[14] In addition to the results reported in Table 4, we experimented with other specifications, including a mulitnomial logit which distinguished moves between tenure status and moves within the same tenure status, and with alternative specifications of the HBS residual variable, without improving the results. By way of comparison, the study by Ermisch and Jenkins (1997) confirms the association between spouse retiring and mobility and find a positive significant effect associated with the death of a spouse. Household income is weakly negative for owners but the effect of disability is stronger for renters, as in the present study. The house value-income relationship to moving is not strong. The main difference is in their pooling across five observation points for the same household to create a large sample, which may give some greater precision to their estimates.

preference parameters would be substantial. Here we focus on the interaction of calculated housing costs for 1988-89, as discussed in Section 2, shocks to housing wealth that occurred between 1988-89 and 1994, and the time path of financial assets.

Our approach is to estimate a model of 1994 financial wealth, based on Lee's (1978) empirical methodology for assessing the impact of union status on wages in which union status and wages are modelled in a two-stage process to allow for selection into union membership/non-membership to be determined by the difference in wages in the two sectors. In the present context the methodology allows us to assume the mover/stayer decision is determined by the difference in the size of financial asset holdings in the two states. Moving will be influenced by the extent to which it allows portfolio adjustment (allowing for moving costs). This is important since it allows us to control for the question of mover/stayer selectivity in the determination of the 1994 level of financial assets. The model structure is as follows (see Maddala (1983), pp. 236ff):

$$A_{Mi} = \theta_{M0} + X_{Mi}\theta_{M1} + \varepsilon_{Mi} \tag{4}$$

$$A_{Si} = \theta_{S0} + X_{Si}\theta_{S1} + \varepsilon_{Si} \tag{5}$$

$$I_i^* = \delta_0 + \delta_1(A_{Mi} - A_{Si}) + \delta_2 X_i - \upsilon_i \tag{6}$$

A_{Mi} and A_{Si} are (log) financial asset holdings in 1994 under each state (mover or stayer), although only observed for each household i in which ever transition occurs between 1988-89 and 1994. I^*_i is a latent indicator variable capturing the net benefits of moving, such that moving occurs if $I^*_i > 0$ or not otherwise. X is a vector of covariates, θ_{M0} , θ_{S0} and θ_0 are intercepts, θ_{M1} , θ_{S1} and θ_1 are coefficient vectors and ε_{Mi}, ε_{Si} and η_i are independently normally distributed disturbance terms.

Substitution of the asset equations (4) and (5) into the selection equation gives an equation of the form:

$$I_i^* = \gamma_0 + \gamma_1 W_i - u_i^*$$

(7)

where W_i contains the exogenous variables in X. With the disturbance normalised to have unit variance, equation (7) can be estimated as a conventional probit. Conditional on mover/stayer status the financial asset equations are given by:

$$A_{Mi} = \alpha_{M0} + X_{Mi}\alpha_{M1} - \sigma_{1u^*}\left[\frac{f(\gamma_i)}{\Phi(\gamma_i)}\right] + \eta_{Mi}$$

(8)

$$A_{Si} = \alpha_{S0} + X_{Si}\alpha_{S1} - \sigma_{2u^*}\left[\frac{f(\gamma_i)}{1-\Phi(\gamma_i)}\right] + \eta_{Si}$$

(9)

where $\gamma_i = \gamma_0 + \gamma_1 W_i$ and $\sigma_{ju^*} = \mathrm{cov}(\varepsilon_j, u^*)$, $j = M, S$. The right hand side term in brackets is a conventionally defined selectivity term, expressed in terms of the density (f) and cumulative distribution (Φ) of a standard normal distribution. Given this formulation of the model we predict a negative selectivity coefficient in equation (8) (movers) and a positive one in equation (9) (stayers).

We can posit at least three hypotheses concerning the relationship between HBS in 1988-89 and financial asset changes. The first is that, if HBS and financial wealth are characterised by substantial measurement error, there should be no relation between HBS in 1988-89 and changes in financial assets between then and 1994. The second is that 'high' HBS in 1988-89 indicates an 'unaffordable' level of housing which, in the absence of explicit downsizing between 1988-89 and 1994, as is apparent in our data in section 3, would suggest either a lower level of consumption or a reduction in financial assets over that period, and thus the potential for a *negative* correlation between HBS and the change in financial assets. The third possibility is that a 'high' HBS reflects a preference for housing wealth over other kinds of wealth (substitution between wealth categories, which would also give a negative partial

correlation) or a preference for wealth accumulation *per se*, which would induce a *positive* correlation between HBS (via the ratio of housing wealth to income) and financial wealth.

The relationship between HBS in the 1988-89 and the financial wealth trajectory is unlikely on its own to enable us to differentiate tastes or constraints from problems of measurement error in the housing wealth variable, although a positive coefficient on the HBS variable in the financial asset equation would seem to permit only one explanation, from the preceding discussion. However, given additional information concerning shocks to housing wealth, here proxied by differential changes in house prices across the regions over the period, there is scope for more refinement. In particular if, as argued previously, owner-occupiers at this stage of the life-cycle increasingly regard home ownership as an investment as well a consumption good, adverse shocks to housing wealth might be expected to lead over the period in question to disproportionately *higher* financial assets if households have a precautionary saving motive. In addition, moving house might also be expected to raise financial assets at this stage of the life-cycle, if such moving was characterised as a portfolio adjustment.

Tables 5 and 6 report estimates of equations (5) and (6) for renters and owners respectively. The selectivity term is computed from the probit estimates reported in equations (4) and (5) in Table 3.[15] Covariates include the (predetermined) log level of financial assets in 1988, household characteristics in 1994, changes in the current and potential financial circumstances of households between 1988-89 and 1994, household retirement status and housing budget 'disequilibrium' (HBS) in 1988-89 and the change in housing wealth between 1988-89 and 1994 as captured by the appropriate regional house price change.

Other controls in the equations in Tables 5 and 6 which might induce a precautionary saving-type response include a worsening of disability (although the cushioning effect of financial assets might outweigh the precautionary accumulation of financial assets) and 'abnormal' retirement behaviour relative to the household's expectation (although asset evolution and

[15] Two stage estimates are reported in preference to maximum likelihood estimates, since these provide estimates of the asset equations which are less sensitive to mispecification in the mover probits.

retirement behaviour are ultimately simultaneously determined). Finally, controls in the equation with no particular link either to housing or to adverse 'shocks' include household characteristics in 1994, other receipt of financial assets, and some household state variables for 1988-89.

For renters, in Table 5, there is a plausible sub-set of significant coefficients. Financial assets in 1994 depend strongly on assets in 1988 and positively on receipt of pension scheme lump sums for both movers and stayers. For stayers financial wealth is positively associated with being single and with having children in the home and negatively with high and worsening disability, involuntary retirement and the inheritance of property. The significance of an adverse earlier than expected retirement effect suggests little evidence of a precautionary motive. Finally increasing regional house prices are positively associated with financial assets for renter stayers, a plausible result since it suggests that renter stayers prefer (to stay) to accumulate other assets if owner-occupier housing becomes less affordable. Given the poor performance of the mover probit for renters, we might expect to find little sample selection effects on the determination of financial assets. However the selectivity term is significant and has the correctly predicted sign for stayers.

A different, more illuminating, picture emerges for owner-occupiers in Table 6. For movers assets in 1994 are significantly related to being single, having children at home, voluntary retirement, worsening disability, having received a pension, and retirement status in 1988-89. For stayers assets in 1994 are significantly positively related to assets in 1988, to being female, having children at home, having received a pension lump sum and to the spouse being already retired in the first wave. A significant U-shaped relationship is found with age, and a negative relationship with disability level, voluntary and late retirement between waves and inheritance of property. For both groups an adverse shock to regional house prices induces an *increase* in financial assets; the effect is four times greater for movers with a 1% house price fall being associated with 3.8 per cent rise in assets compared to a 0.9 per cent rise for stayers. These coefficients suggest the existence of an operational precautionary saving motive. Finally for stayer owner-occupiers there is a positive and significant coefficient on the HBS variable. Given the earlier discussion as to the possible signs this last coefficient could take, and what

these might signify, this result seems to suggest that measurement error and 'unaffordable' housing can be ruled out. The coefficient would seem to measure a preference for asset-holding *per se*, suggesting that individuals with more valuable houses also accumulate financial assets faster (even when controlling for the previous *level* of financial assets). Both selectivity coefficients are of the correct sign and highly statistically significant, showing that house moving and asset portfolio decisions are highly interdependent.[16]

[16] An obvious final exercise would be to re-estimate the "structural" probit given in equation (6) by generating predicted assets levels for each household in either state (moving or staying), in order to establish is the predicated asset change, after selectivity correction, from moving is significant determinant of the probability of moving. However the results of this exercise failed to yield a statistically significant predicted asset effect on moving probability.

5. CONCLUSION

This paper has examined the trajectory of housing wealth and financial assets for households at, and subsequent to, retirement age in the context of a stylised model of the life cycle hypothesis of consumption. Using data from the two waves of the Retirement Survey, empirical results broadly confirmed results in the US literature, showing that substantial housing wealth is often retained into old age, whether for bequest or precautionary motives, or because transactions costs outweigh the gain from downsizing. But a significant minority of households thereby incurs large user costs of housing (Housing Budget Shares). Homeowners also have significant financial assets, whereas renters generally have very low levels of financial assets and low net saving rates over the period.

The period of observation of the cohort between 1988-89 and 1994 is an unusual one, in that real house prices fell sharply over that period, while financial asset returns remained buoyant. In effect, owner-occupying households saw a portfolio shift towards greater liquidity. One possibility considered was there was a behavioural aspect to this shift, reflecting precautionary saving in the light of an adverse shock to housing wealth. By capturing the house price shock through regional price changes, some support for this hypothesis was provided: a 10% reduction in nominal regional house prices was associated on average with an increase in holdings of financial wealth for stayer owner-occupiers of £1900 and for mover owner-occupiers of £7800, other things being equal, between 1988-89 and 1994.

In contrast, there was little evidence that households with high HBS in 1988-89 were either more likely to move or to run down financial assets. It is likely that the adverse movement in house prices over the period was a factor behind the low rate of moving, and, given the low rate of moving, a mobility equation is unable to pick up more than a few significant covariates. However there is evidence from significant sample selection effects that moving and financial asset determination are interdependent. Finally and by contrast, an increase in ‘disequilibrium’ housing budget share of 10 percentage points in 1988-89 is associated with an £1100 *higher* level of financial assets in 1994 for stayer owner-occupiers, when conditioned on financial assets in 1988-89 and other controls. This strongly suggests that what is being observed in the

housing budget share is heterogeneity of household tastes for overall wealth accumulation rather than any ‘excess’ housing, planned portfolio reallocations, or noise in the data. Policy activism in the form of measures to help the elderly to achieve what might be regarded as ‘more appropriate’ housing provision may therefore be expected to have relatively little impact. However a detailed analysis of this assessment would require econometric evaluation of specific policy experiments, something which we leave to future research.

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Table 1

Average housing and financial wealth by age and tenure status of head of household in 1988

Age, tenure	No.	1988 Mean	1988 Median	1994 Mean	1994 Median	Mean Change	% Change
Housing wealth							
Owners							
55-59	306	106,912	101,617	78,751	75,794	-28,160	-26.3%
60-64	354	98,783	81,651	72,829	67,521	-25,954	-26.3%
65-69	298	96,139	85,553	70,662	67,766	-25,477	-26.5%
Housing wealth							
Renters							
55-59	125	0	0	9,491	0	9,491	-
60-64	139	0	0	5,012	0	5,012	-
65-69	175	0	0	2,454	0	2,454	-
Financial wealth							
Owners							
55-59	306	16,999	5,236	30,301	15,377	13,302	78.3%
60-64	354	22,594	8,438	30,410	11,247	7,817	34.6%
65-69	298	21,407	9,035	25,154	10,925	3,747	17.5%
Financial wealth							
Renters							
55-59	125	4,769	1,522	5,162	1,889	392	8.2%
60-64	139	3,996	709	4,018	1,813	22	0.1%
65-69	175	3,295	1,363	3,478	1,404	183	5.6%

Table 2

Housing budget shares by tenure type and tenure transitions

Tenure Type	No. in sample	1988 Mean	1988 Median	1994 Mean	1994 Median
Owner	958	0.201	0.169	0.201	0.176
of which					
Owning stayer	889	0.202	0.170	0.200	0.167
Owning mover	61	0.181	0.167	0.186	0.159
Owner to renter	8	0.184	0.187	0.445	0.485
Renter	439	0.251	0.227	0.342	0.331
of which					
Renting stayer	366	0.250	0.224	0.343	0.332
Renting mover	35	0.260	0.251	0.417	0.400
Renter to owner	38	0.251	0.241	0.263	0.222
Total	1,397	0.216	0.184	0.245	0.208

Table 3

Housing Expenditure Regressions (1988-89)

Dependent variable: Ln(monthly housing expenditure**)**

Variable	Renters		Owners	
Constant	0.629	(1.485)	2.684	(0.517)*
Ln(monthly gross income)	0.865	(0.102)*	0.302	(0.023)*
Age	-0.036	(0.040)	-0.004	(0.014)
Age squared/100	0.0002	(0.0003)	-0.000006	(0.0001)
Head of household:				
Single	0.167	(0.131)	-0.139	(0.047)*
Widowed	0.059	(0.120)	-0.164	(0.047)*
Divorced	0.337	(0.129)*	-0.142	(0.058)*
Female	-0.054	(0.097)	-0.100	(0.039)*
Working part time	0.329	(0.164)	0.136	(0.045)*
Unemployed	0.126	(0.170)	0.049	(0.067)
Retired	0.332	(0.131)*	0.089	(0.037)*
Housewife	0.116	(0.198)	0.195	(0.105)+
Self-employed	0.294	(0.202)	0.183	(0.066)*
Disabled	0.024	(0.129)	0.032	(0.049)
Spouse employed	-0.090	(0.185)	-0.073	(0.041)+
Has private pension rights	0.020	(0.082)	-0.047	(0.028)+
Private tenant	-0.171	(0.110)	-	-
Owns outright	-	-	-0.371	(0.028)*
Region:				
Scotland	-0.279	(0.150)+	-0.146	(0.070)*
Northern England	-0.024	(0.156)	-0.220	(0.065)*
York & Humber	0.017	(0.172)	-0.155	(0.052)*
North West	0.118	(0.150)	-0.101	(0.052)+
East Midlands	0.175	(0.174)	0.082	(0.057)
East Anglia	-0.380	(0.174)*	0.271	(0.067)*
Greater London	0.215	(0.159)	0.343	(0.054)*
South East	0.005	(0.151)	0.388	(0.046)*
South West	-0.147	(0.175)	0.271	(0.054)*
Wales	-0.308	(0.200)	-0.307	(0.062)*
Number in sample	439		958	
R_2	0.2982		0.5662	
RMSE	0.7188		0.3534	

Notes: Default categories are: married couple, headed by a man, employed with inactive spouse, with no private pension, in public renting (renters) or with a mortgage (owners) living in the West Midlands.
Coefficients (standard errors in brackets) significant at 5% level indicated *, 10% by +.

Table 4

Probabilities of Moving by Tenure Status (1988-89 to 1994)

Dependent variable: Probability (moving) = 1

Variable	(1) Renters		(2) Owners		(3) Owners	
Constant	-1.424	(0.992)	-2.650	(0.630)*	-2.506	(0.703)*
1994 status						
Ln(monthly gross income)	0.067	(0.206)	0.241	(0.124)*	0.233	(0.143)+
Head of household female	0.077	(0.173)	-0.368	(0.160)*	-0.367	(0.163)*
Children	-0.149	(0.438)	-0.139	(0.356)	-0.154	(0.364)
Change in status 1988-89 to 1994						
Head retired voluntarily	-0.266	(0.322)	0.209	(0.203)	0.190	(0.207)
Head retired involuntarily	0.257	(0.324)	0.310	(0.291)	0.322	(0.298)
Head retired late	-0.117	(0.232)	0.200	(0.177)	0.214	(0.180)
Spouse retired	0.153	(0.229)	0.386	(0.152)*	0.398	(0.155)*
Disability worsened	0.366	(0.209)+	-0.249	(0.245)	0.258	(0.249)
Inherited property	0.799	(0.489)	0.563	(0.223)*	0.580	(0.227)*
Received pension lump sum	-0.003	(0.277)	-0.121	(0.177)	-0.125	(0.179)
Regional house price change: 1988-89 to 1994	-0.424	(0.398)	0.217	(0.433)	0.590	(0.534)
1988-89 housing circumstance						
Residual HBS	0.055	(0.102)	-0.063	(0.161)	-	-
High inc-high housing wealth	-		-		0.003	(0.234)
High inc-low housing wealth	-		-		-	(0.293)
Low inc-high housing wealth	-		-		0.560+	(0.233)
					-0.101	
Number in sample	439		958		958	
Log Likelihood	-192.6		-235.1		-232.4	
Chi-squared (k)	9.91		25.75*		31.13*	

Notes: 'Disability worsened' is a one point or more worsening of the self-assessed status coded by OPCS disability score; 'inherited property' and 'received pension lump sum' are dummy variables, 'regional house price change' is a proportionate change.
'Residual HBS' are residuals computed from appropriate column of Table 3.
Coefficients (standard errors in brackets) significant at 5% level indicated *, 10% by +.

Table 5

Determination of household financial assets, 1994: Renters

Dependent variable: Log Financial assets 1994

Variable	Movers		Stayers	
Constant	5.091	(9.215)	-0.640	(1.819)
Log Financial assets 1988-89	0.398	(0.095)*	0.434	(0.049)*
Age 1994	-0.383	(0.356)	-0.026	(0.172)
Age 1994 squared	0.013	(0.012)	0.001	(0.006)
Head of household female	0.610	(0.593)	-0.089	(0.289)
Single	-0.982	(0.730)	0.662	(0.338)+
Children	-1.388	(1.378)	1.382	(0.578)*
Disability severity score	0.005	(0.087)	-0.081	(0.048)+
Change in status 1988-89 to 1994				
Spouse died	1.057	(0.723)	0.148	(0.338)
Head retired voluntarily	-1.493	(1.526)	0.412	(0.639)
Head retired involuntarily	-1.477	(1.355)	-2.210	(0.719)*
Head retired late	-1.011	(0.801)	0.366	(0.438)
Disability worsened	-0.221	(1.657)	-2.285	(0.803)*
Inherited property	0.128	(3.362)	-5.715	(2.327)*
Received pension lump sum	1.333	(0.679)+	1.295	(0.315)*
Regional house price change: 1988-89 to 1994	-0.767	(2.174)	2.971	(0.921)*
Head retired 1988-89	-0.406	(0.721)	0.002	(0.337)
Spouse retired 1988-89	-0.864	(0.637)	0.494	(0.307)
Residual HBS 1988-89	0.116	(0.282)	-0.204	(0.156)
Selectivity term	-2.128	(5.636)	15.771	(5.248)*
Number in sample	73		366	
F(19, 53)	3.92*			
F(19, 346)			8.62*	

Notes: see Table 4.
Age is age in years-54 for ease of interpretation.

Table 6

Determination of household financial assets, 1994: Owners

Dependent variable: Log Financial assets 1994

Variable	Movers		Stayers	
Constant	15.875	(4.029)	4.792	(14.690)*
Log Financial assets 1988-89	0.076	(0.107)	0.394	(0.027)*
Age 1994	-0.377	(0.379)	-0.180	(0.091)*
Age 1994 squared	0.013	(0.014)	0.007	(0.003)*
Head of household female	1.212	(0.885)	0.746	(0.199)*
Single	1.483	(0.832)+	0.507	(0.202)
Children	4.011	(1.271)*	0.579	(0.276)*
Disability severity score	-0.063	(0.136)	-0.180	(0.035)*
Change in status 1988-89 to 1994				
Spouse died	-0.167	(0.775)	0.027	(0.224)
Head retired voluntarily	1.184	(0.701)+	-0.578	(0.220)*
Head retired involuntarily	-0.304	(0.875)	-0.467	(0.295)
Head retired late	0.840	(0.669)	-0.536	(0.214)*
Disability worsened	1.699	(0.904)+	-0.146	(0.178)
Inherited property	-1.093	(1.015)	-2.003	(0.340)*
Received pension lump sum	1.258	(0.468)*	0.685	(0.147)*
Regional house price change: 1988-89 to 1994	-3.823	(1.354)*	-0.924	(0.350)*
Head retired 1988-89	1.853	(0.709)*	-0.192	(0.184)
Spouse retired 1988-89	1.371	(0.682)*	0.782	(0.151)*
Residual HBS 1988-89	0.189	(0.348)	0.582	(0.154)*
Selectivity term	-4.361	(1.556)*	10.296	(1.319)*
Number in sample	69		889	
F(19, 49)	3.00*			
F(19, 869)			28.81*	

Notes: see Table 4.
Age is age in years-54 for ease of interpretation.
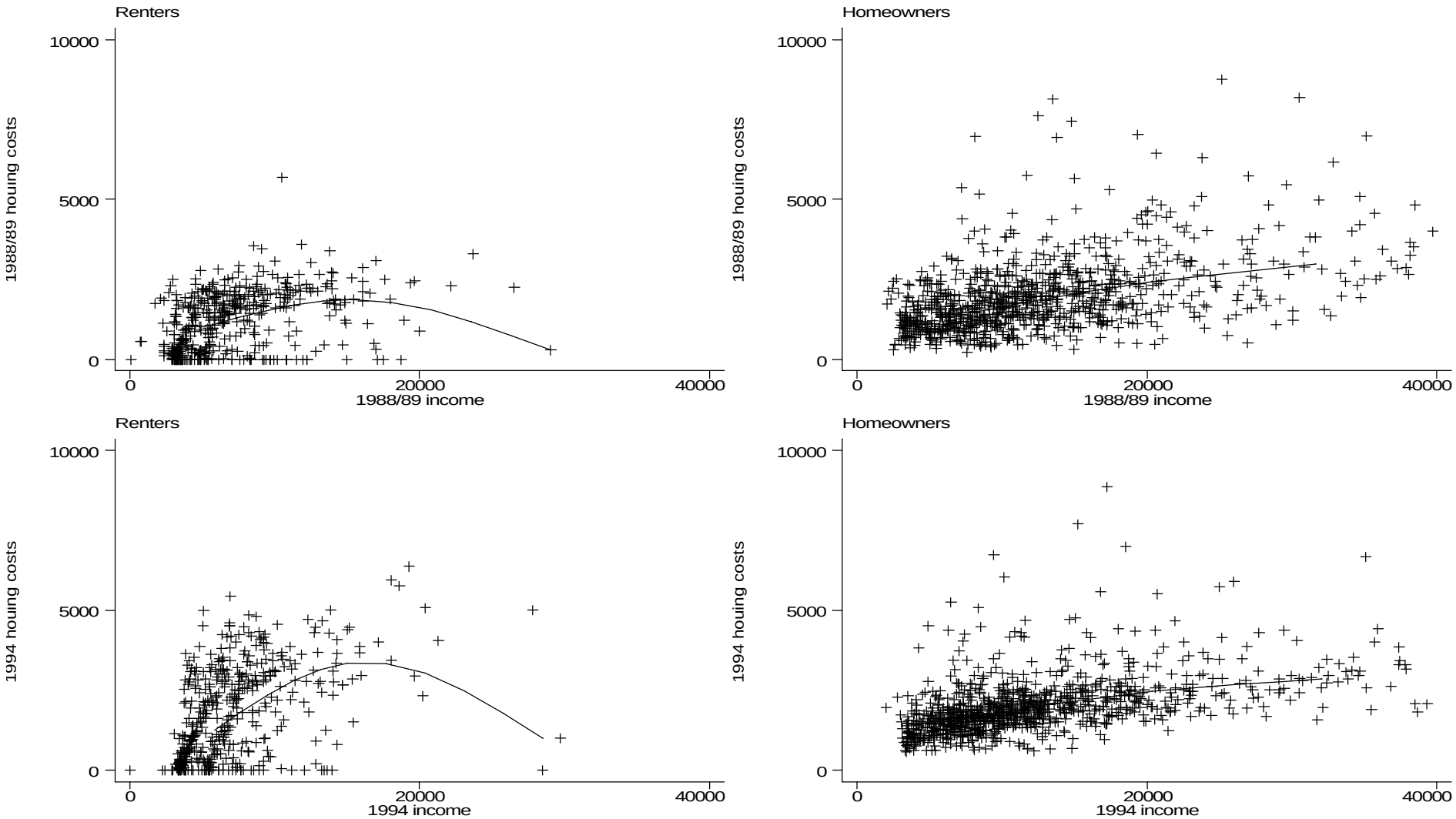
Figure 1: Cross plot of housing costs, housing budget shares and household income, 1988/89