THE CENTRE FOR MARKET AND PUBLIC ORGANISATION

The Centre for Market and Public Organisation, a Research Centre based at the University of Bristol, was established in 1998. The principal aim of the CMPO is to develop understanding of the design of activities within the public sector, on the boundary of the state and within recently privatised entities with the objective of developing research in, and assessing and informing policy toward, these activities.

Centre for Market and Public Organisation
University of Bristol
Department of Economics
Mary Paley Building
12 Priory Road
Bristol BS8 1TN

Tel: (0117) 954 6943
Fax: (0117) 954 6997
E-mail: cmpo-office@bristol.ac.uk

The retirement-consumption puzzle and involuntary early retirement: Evidence from the British Household Panel Survey

Sarah Smith

January 2006

Working Paper No. 06/138

ISSN 1473-625X

CMPO Working Paper Series No. 06/138

The retirement-consumption puzzle and involuntary early retirement: Evidence from the British Household Panel Survey[1]

Sarah Smith

CMPO, University of Bristol and Institute for Fiscal Studies

January 2006

Abstract

This paper uses data from the British Household Panel Survey (BHPS) to shed further light on the fall in consumption at retirement (the "retirement-consumption puzzle"). Comparing food spending of men retiring involuntarily early (through ill health or redundancy) with spending of men who retire voluntarily, it finds a significant fall in spending only for those who retire involuntarily. This is consistent with the observed fall in spending being linked to a negative wealth shock for some retirees.

Keywords: Retirement, life-cycle model of consumption and saving

JEL Classification: D91, J26

Acknowledgements

I would like to thank Richard Blundell and James Banks for their advice and help. The paper was much improved after comments from an anonymous referee and from participants at an IFS seminar and at the Royal Economic Society Conference and the BHPS Users Conference. Data from the BHPS were made available by the Economic and Social Research Council. I take full responsibility for any remaining errors.

Address for Correspondence
CMPO
Department of Economics
University of Bristol
12 Priory Road
Bristol
BS8 1TN
Sarah.smith@bristol.ac.uk
www.bris.ac.uk/Depts/CMPO/

[1] This paper is forthcoming in the Economic Journal

CMPO is jointly funded by the Leverhulme Trust and the ESRC

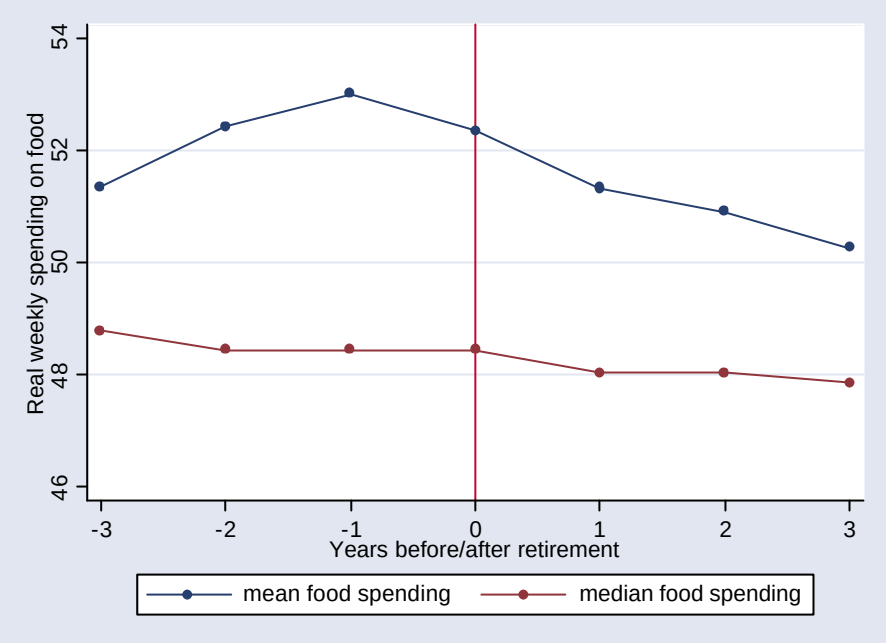
A number of studies (see Hamermesh (1984), Banks et al (1998), Bernheim et al (2001), Ameriks et al (2002), Hurd and Rohwedder (2003), Miniaci et al (2003), Haider and Stephens (2004), Aguiar and Hurst (2004) and Blau (2004)) have found that average consumption falls significantly at retirement, even allowing for obvious work-related spending items. This fall, common across a number of countries (US, UK and Italy), across different time periods and across different measures of spending, is at odds with the predictions of a simplified life-cycle model of consumption and has become known as the "retirement-consumption puzzle".

Looking at consumption at retirement is important for at least two reasons. First, it can give insights into how well off people are in retirement, compared to when they are working. Particularly if retired people hold substantial levels of (non-annuitised) wealth which they use to finance consumption, looking directly at spending may provide a better measure of how well off people are than income replacement rates.

Secondly, it may provide one way of assessing whether people have saved enough for their retirement, an issue attracting increasing policy interest in the UK given the government's deliberate attempt to shift more of the burden of pension provision from the state to individuals. Looking at what happens to people's spending in retirement is one possible way to gauge the adequacy of their saving – if people have to reduce spending, contrary to the predictions of a forward-looking life-cycle model of consumption and saving, it may suggest that they have not saved enough. But, before drawing policy conclusions, it is important to try to understand why the drop in spending has occurred – whether because of irrational financial planning prior to retirement (Bernheim et al (2001)), or earlier than expected retirement (Haider and Stephens (2004)) and/or lower than expected pension income, or something else. Indeed, a fall in spending may be optimal given increased leisure time (Hurd and Rohwedder (2003), Aguiar and Hurst (2004)).

This paper revisits the retirement-consumption puzzle and looks at what happens to spending on food at retirement using panel data drawn from the British Household Panel Survey (BHPS). Consistent with the earlier findings for the UK (Banks et al (1998)), there is evidence of a fall in mean (and median) spending on food around the time of retirement (see Figure 1).

Figure 1: Food spending at retirement



This paper explores one hypothesis suggested by Banks et al (1998) as to what might explain the drop in consumption – that, at least for some people, retirement is accompanied by a negative wealth shock that causes them to reduce their spending. In particular, the paper looks at whether the fall in consumption may be caused by unanticipated early retirement. It does this by categorizing retirements as "voluntary" or "involuntary", where involuntary retirements occur earlier than anticipated as a result of ill-health or redundancy,[2] and then comparing what happens to spending across the two groups. Involuntary retirement is more likely to be associated with a negative wealth shock because of lost earnings and/or pension wealth and if spending falls only among this group, it would suggest that the retirement-consumption puzzle might be at least partly resolved in terms of a negative wealth shock.

The rest of the paper is as follows. The next section summarizes previous, related studies on the retirement-consumption puzzle. Section 2 discusses the data and the definitions of voluntary and involuntary retirements and presents some simple descriptive statistics, while section 3 presents the results of fixed-effects regressions comparing spending at retirement for voluntary and involuntary retirees. Section 4 offers some conclusions.

[2] Of course, redundancy does not necessarily lead to retirement (permanent labour market exit), but the wage cut someone would have to take in getting another job may be enough to make them stop working altogether.

1. The puzzle and possible resolutions

The fact that observed consumption falls at retirement is a challenge to the simple, one-consumption-good life cycle model. In its simplest form, with utility dependent only on consumption, no uncertainty and assuming that marginal utility is continuous and declining in consumption, the maximisation of lifetime utility implies that the marginal utility of consumption, and consumption itself, should be smoothed. In this case, falling consumption at retirement would imply irrational behaviour by consumers. This is the conclusion reached by Bernheim et al (2001) who argue that the evidence of a fall in spending at retirement points to people using rules of thumb, rather than forward-looking optimising behaviour, to determine retirement saving.

One possible explanation is that the studies capture a fall in *spending* at retirement, which is not the same as a fall in utility-producing *consumption* at retirement. Households may stock up on durables immediately prior to retirement and enjoy a higher flow of services from durables after retirement; thus while their observed spending may fall, their overall consumption remains the same. However, Miniaci et al (2003) find no evidence of pre-retirement stocking up of durables. Another possible explanation is that there is a necessary level of (non-utility-producing) spending associated with working, for example the cost of buying suits and travelling to work, that stops when people retire. Again, this would imply that, while observed spending falls, (utility-producing) consumption may be smoothed over retirement. This effect will be reinforced to the extent that the spending of the retired on certain items is subsidised (transport and prescription charges in the UK, health in the US). However, Banks et al (1998) take out obvious work-related spending items from total spending and look at sub-components of spending and still find evidence of a fall at retirement.

Two possible extensions to the simple life cycle model, however, would be consistent with a fall in spending at retirement.

One possibility is that spending falls as a result of the big increase in leisure on retirement.[3] Spending would fall either, if consumption and leisure are substitutes in a household utility function, or if time is a substitute for spending in a household production function to generate consumption. Aguiar and Hurst (2004) use detailed information on food intake and time use in the US to show that, despite a fall in

[3] There is clearly an issue about whether such a discrete change is optimal from the individual's point of view given diminishing marginal returns to leisure. There are possible reasons why individuals may not want to reduce their hours gradually, including fixed costs associated with working and/or economies of scale in converting time into utility-producing leisure. More likely, they may face constraints in their choice of the number of hours to work as a result of the fixed costs of employment to the employer and, for people with a defined benefit occupational pension in the UK, current legal restrictions on drawing any pension income while still working for the same employer.

spending on food, nutritional content and quality are maintained and that more time is spent on shopping and food preparation.

As evidence in support of the leisure-substitution hypothesis, Hurd and Rohwedder (2003) show that most people anticipate that spending will fall at retirement and, if anything, that the anticipated decline is greater than the fall in spending that actually occurred among (a different group of) those who had already retired (20% compared to 12% among married couples, for example). Ameriks et al (2002) also find that many people expect to spend less in retirement.

However, this evidence, while interesting, is not conclusive about the mechanism that causes actual spending to fall (people may anticipate that spending will fall if they are following a simple rule of thumb, for example). Hurd and Rohwedder's evidence is less convincing for being based on cross-section analysis and there are important differences between sub-groups. For example, anticipated declines in spending at retirement vary little with income, wealth and health status, but the actual falls in spending are far greater for those who, post-retirement, are in the bottom income and wealth quartiles and self-report poor health. Using data from the earlier Retirement History Survey, which does link expected and actual changes in spending for the same people, Haider and Stephens (2003) show there is little correlation between the two – the fall in spending that occurs in retirement is broadly the same whatever people's prior expectations.

A second possible explanation for the fall in consumption is that retirement may be associated with a negative shock to wealth. If retirement is earlier than anticipated, for example, there may be lost earnings and/or pension accrual. This is quite plausible – Disney and Tanner (1999), for example, show that more people retire earlier than expected than later. Of course, earlier than expected retirement may follow from a positive wealth shock, but Tanner (1998) and Marmot et al (2004) find many people citing ill health and compulsory early redundancy as the main reason for early retirement. Blau (2004) calibrates a model of retirement showing that uncertainty over the timing of retirement will generate a fall in spending if retirement is a discrete event. Banks et al (1998) and Bernheim et al (2001) explore whether spending falls when retirement is anticipated by instrumenting retirement with lagged retirement and age respectively. In both cases, the drop is smaller when retirement is anticipated (although not eliminated altogether). For the US, Haider and Stephens (2003) reach a similar conclusion using subjective retirement expectations as the instrument. This paper adopts a different approach to testing the hypothesis that the fall in spending may be linked to unanticipated early retirement, that is to compare the spending of "voluntary" and "involuntary" retirees. The next section discusses in detail how these two groups are defined.

2. The data

The data in this paper are drawn from the first eleven waves of the BHPS. This panel dataset has been collecting information on the same sample of approximately 10,000 individuals each year since 1991. The analysis focuses on a cohort of men aged 45 – 64 in the first year of the survey, a total sample of around 2,000. Since the BHPS covers all ages, it has a smaller number of individuals in the relevant age range for studying retirement than, for example, the US Health and Retirement Survey and the new English Longitudinal Survey of Ageing. Nevertheless, there is a reasonable-sized sample of more than 500 retirements[4] and a wide number of variables, including information on spending, well-being, income and health. As discussed further below, the variables are often not ideal (the information on spending, for example is very limited compared to the Family Expenditure Survey). However, given that the main purpose of this paper is to compare behaviour across different groups, this is arguably less of a problem than it otherwise would be.

Voluntary/ involuntary retirement

To start with, the definition of retirement used is the first period that someone is both not working and reports their employment status as "retired".[5] As other studies have found (Tanner (1998), Marmot (2004)), the experience of retirement is very varied. First, there is a wide spread of retirement ages (shown in Figure 2) with around 60% of men retiring before the state pension age of 65, 20% at age 65 and 20% after age 65.

[4] See Bardasi et al (2000) for a study of incomes at retirement using the BHPS

[5] In the BHPS someone can not be simultaneously working and retired since these are mutually exclusive categories. In other surveys, such as the UK Retirement Survey and ELSA, retirement status is asked independently of employment status, so that someone can be retired and working.

Figure 2: Distribution of retirement ages

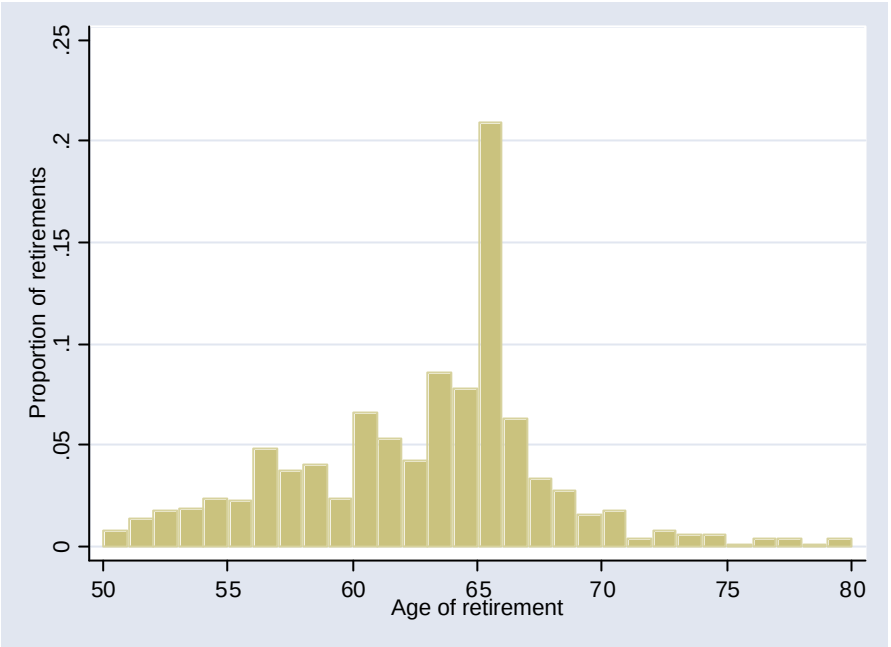
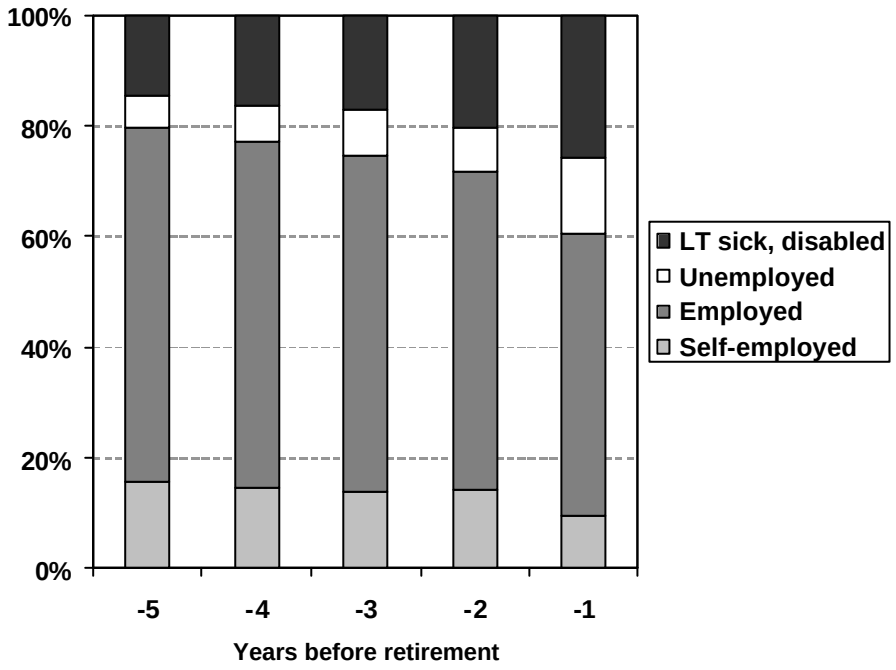


Figure 3: Employment status prior to retirement



There is also a variety of routes into retirement. The majority of men retire from (usually full-time) employment, but as shown in Figure 3, around 40% of men move into retirement from another (self-assessed) non-working state, usually unemployed or long-term sick/disabled, and there is an increasing proportion of men in these non-working, non-retired states in the run-up to retirement.

Finally, among men who retire before the state pension age, there is a wide range of different reasons given for having done so. In Wave 11 of the BHPS, as part of a special retirement module, respondents are asked to say why they retired earlier than they could have done. The answers, summarized, in Table 1, broadly reflect varying degrees of voluntarism – "offered reasonable financial terms" and "to enjoy life while young and fit" suggest that early retirement was the individual's own voluntary choice, while "own ill-health" and "redundant, dismissed and no choice" suggest that the individual retired earlier than they may have anticipated and/or wanted to. Of course, these reasons may reflect an element of post-hoc rationalisation and/or recall error. But, as in earlier work (Tanner (1998)) there is a strong link between the route into retirement and the reason given. Those who report ill-health or redundancy as the main reason for early retirement are more likely to enter retirement through another non-working state, while those who enter retirement straight from employment are more likely to report reasonable financial terms or enjoying life while young and fit.

Table 1: The (main) reason for early retirement

	All	Retired from work	Retired from non-work
Own ill-health	23.3%	15.0%	48.5%
Redundant/ dismissed/ no choice	18.1%	15.0%	27.3%
Offered reasonable financial terms	31.6%	36.0%	18.2%
To enjoy life while young and fit	15.8%	20.0%	3.0%
Other	11.2%	14.0%	3.0%
Total	100%	100%	100%

This suggests that there are (at least) two distinct experiences of retirement. For the majority of people, retirement appears to be, broadly, voluntary. In these cases, people enter retirement straight from employment and, if they retire early, do so because they are offered reasonable financial terms or to enjoy life while young and fit. For some, however, there is evidence that retirement is involuntary. They are more likely to cite ill-health or redundancy as the main reason for retiring early and to enter retirement from employment via another non-working state (suggesting that at the time they leave work, they may not anticipate that their exit is going to be permanent). For the retirement-consumption puzzle, this distinction is potentially important because those who retire involuntarily, earlier than they anticipated or wanted, are more likely to experience a negative shock to their wealth through lost earnings or pension accrual that may cause them to reduce spending in retirement.

The issue explored in this paper is whether there are observable differences in spending at retirement for the two types of retirees that would support this hypothesis.

For the purpose of this analysis, the two types of retirement – voluntary and involuntary – are defined in the following way (see Appendix for further details):

- **"Voluntary retirees"** – retire directly from working, are observed to work for at least two consecutive periods prior to retiring and are not observed to re-enter employment after retirement (= 226 retirements).
- **"Involuntary retirees"** – retire from a non-work employment state (typically unemployed or long-term sick/ disabled), are observed working prior to becoming unemployed/sick and are not observed to re-enter employment after reporting themselves as retired (= 57 retirements). In these cases, the date of retirement is redefined to be when the person left work rather than when they first self-reported themselves as retired.

The number of retirements that can be allocated to one of these two groups (283) is smaller than the total number of retirements observed in the BHPS (around 500). In the majority of cases this is because the person is never observed in work prior to retirement.[6] In other cases, it is because the person re-enters employment after declaring themselves to be retired. The assignment of individuals as "voluntary" or "involuntary" retirees inevitably has a degree of arbitrariness – for example the requirement that individuals are observed not to re-enter work will be more restrictive for those who are observed to retire earlier in the survey period.[7] Section 3 below reports regression results using an alternative definition of being out of work for two consecutive periods. Another possible alternative would be to use the reasons given for early retirement to categorize people as voluntary and involuntary retirees. However, since these are available only in wave 11, this would tend to reduce the sample size further and, as stated above, the responses may be subject to post-hoc rationalisation and/or recall error.

The characteristics of the two groups of retirees are fairly distinct, as shown in the table below. Voluntary retirees tend to have higher occupations and educational qualifications and are more likely to have an occupational pension. Involuntary retirees are more likely to report that their health limits their daily activities.[8] This raises the possibility that any observed differences in spending between the two

[6] This is important since retirement for involuntary retirees is re-defined as when they leave work rather than when they move from non-work to "retired".
[7] Also, the employment states are those at the time of interview, whereas some individuals may change employment state between interviews.
[8] This variable is not available in wave 9 of the BHPS and must be imputed. See Section 3 for details.

groups may be attributable to the different characteristics of the groups rather than the nature of their retirement and this is explored further in the regressions below.

Table 2: Characteristics of voluntary and involuntary retirees

	Voluntary Retirees	Involuntary Retirees
Professional/ managerial occupation	27.9%	17.9%
Manual occupation	52.7%	64.3%
Occupational pension	59.3%	56.1%
Worked in the public sector	76.6%	80.7%
Higher educational qualification	30.9%	17.9%
No educational qualification	31.8%	44.6%
Health limits daily activities (in retirement)	20.3%	42.3%
N	226	57

Measures of spending in the BHPS

The BHPS only collects information on food spending in all waves. Clearly it would be preferable to have a fuller measure of household spending, but as a necessary good with a small income elasticity, food provides quite a strong test of consumption smoothing; if households do not smooth spending on food, they are unlikely to smooth other forms of spending (although if food spending is smoothed, it can not be rejected that total spending falls).

Respondents are asked "approximately how much does your household usually spend each week in total on food and groceries." In the first wave, they are asked to give a continuous answer; in subsequent waves, they are asked to say in which band (out of 12) their weekly food spending lies. They are told to include all food, bread, milk, soft drinks etc, but asked to exclude pet food, alcohol, cigarettes and meals out. Take-aways eaten in the home are, however, included.

To obtain a weekly spending figure, each individual is assigned the mid-point of their reported band each year, adjusted for inflation in food prices.[9] Comparisons with the more detailed spending information in the Family Expenditure Survey shows that mean food spending in the BHPS is slightly higher than in the FES.[10] In part this may reflect the fact that there are fewer observations in the lowest bands in the BHPS (respondents may ignore atypical weeks when they spend very little). Alternatively, respondents may include other grocery items that they regularly buy at the

[9] For wave 1, the continuous answers are first banded, and then the midpoints are assigned.
[10] To calculate the FES figures, the continuous weekly spending figures are converted into bands and then mid-points as in the BHPS.

supermarket such as washing powder, toilet roll etc. When these items are included in the FES spending figures, the two sets of numbers are very similar.

Income and spending before and after retirement

Table 3 summarizes household income and food spending for the two groups of voluntary and involuntary retirees, averaged across all periods before retirement and after. Figures 4 and 5 present the same information slightly differently, showing the paths of the variables in each of the three years before, and the three years after, retirement. In the figures, year 0 represents the first year in which the individual is retired.

Table 3: Mean income and spending

	Before retirement	After retirement
Real weekly household income		
Voluntary retirees	£503	£274
Involuntary retirees	£415	£274
Real weekly household food spending		
Voluntary retirees	£54	£51
Involuntary retirees	£58	£51

As would be expected from their higher level of qualifications and occupational groups, voluntary retirees have higher average incomes prior to retirement. After retirement, however, average incomes of the two groups appear to be very similar. Figure 4 shows that both groups experience a fall in income coinciding with retirement – the fall is absolutely and relatively greater for voluntary retirees.

The summary statistics provide evidence that food spending at retirement also behaves differently for the two groups. In spite of a bigger fall in income, voluntary retirees experience a smaller fall in food spending. Their average food spending is around £3 a week lower after retirement than before; among involuntary retirees average food spending after retirement is around £7 lower than it was pre-retirement. This pattern is reflected in Figure 5 – for voluntary retirees, the path of spending is broadly maintained through retirement, while for involuntary retirees, there is evidence of a fall in spending around retirement.

These preliminary findings are consistent with the hypothesis that involuntary retirees are more likely to experience a negative wealth shock at retirement that causes them to reduce spending. But, they are not conclusive – firstly because they fail to control for other factors (age, for example is related to well-being and varies systematically across the groups) and secondly, because of compositional changes (i.e. the sample

one year after retirement is not necessarily the same as the sample two years after retirement and so on). The next section presents the results of regression analysis that tries to control for both these factors.

Figure 4: Average weekly real income (£), by retirement type

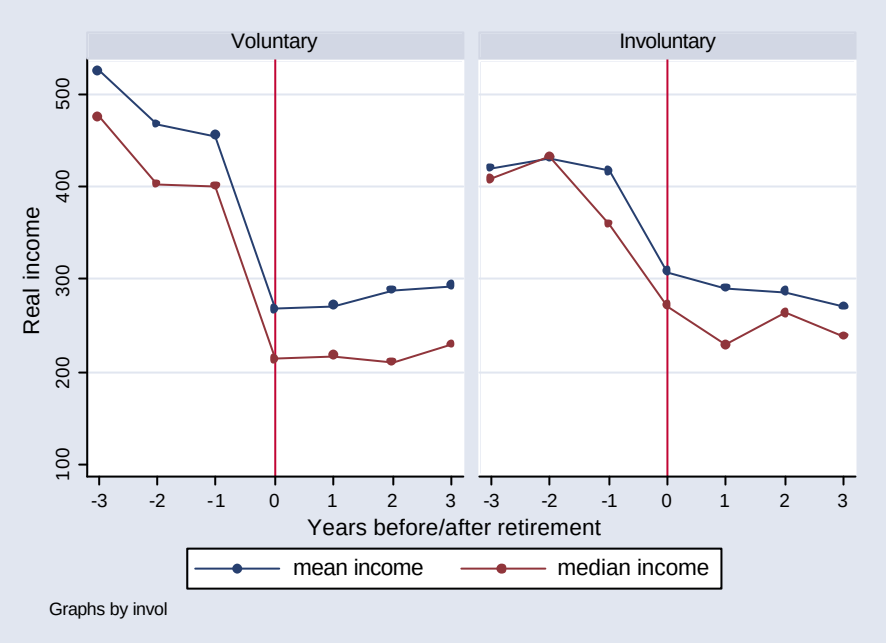
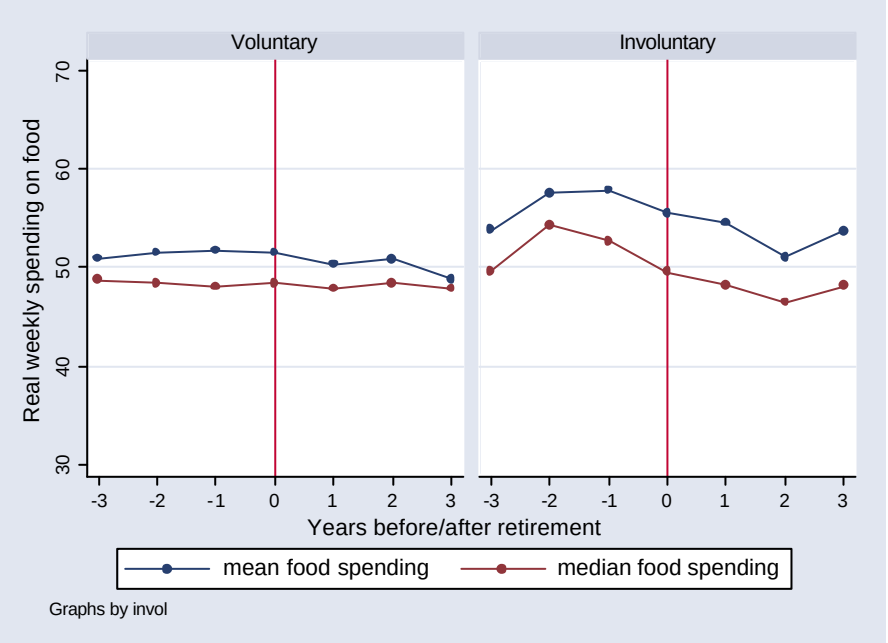


Figure 5: Average weekly real food spending (£), by retirement type



3. Estimation

The estimation approach is derived from a marginal-utility-of-wealth-constant consumption demand function, or Frisch function (see Browning, Deaton and Irish (1985) and Blundell and Macurdy (1999))

Consumers are assumed to choose consumption and leisure according to the value function:

$$V(A_t, t) = \max\{U(C_t, L_t, X_t) + dE[V(A_{t+1}, t+1)]\}$$

subject to the following budget constraint:

$$A_{t+1} = (1+r)(A_t + B_t + W_t H_t - C_t)$$

where d is the consumer's discount rate, A_t is total wealth, C_t is consumption, L_t is leisure, X_t is a vector of demographics, r is the (constant) interest rate, B_t is unearned income, W_t is the wage rate and H_t is number of hours worked.

This yields the following first-order-condition for the marginal utility of consumption and the marginal utility of wealth, ?t (= $\partial V / \partial A_t$):

$$U_C(C_t, L_t X_t) = l_t$$

$$l_t = dE_t[l_{t+1}(1+r)]$$

implying a consumption demand function of the form, $C_t = C(l_t, W_t, X_t)$.

This allows consumption demand to be expressed as a function of an individual's current characteristics (including wages) and a single statistic – the marginal utility of wealth – capturing all other (expected) future information that determines the level of consumption today. This will include the effect of retirement where it is fully anticipated.

With uncertainty, shocks will be reflected in changes in the marginal utility of wealth from one period to the next. It is possible to express the stochastic process for the marginal utility of wealth as follows:

$$\ln l_t = b_t^* + \ln l_{t-1} + e_t^* = \sum_{j=1}^{t} b_j^* + \ln l_0 + \sum_{j=0}^{t} e_j^*$$

(where b^*_t depends on the discount factor, the interest rate and the moments of the forecast error e^*_t). With this specification, the marginal utility of wealth can be captured by an individual fixed effect, $?_0$, plus a function of age plus a random error term, reflecting expectational error in the current period.

This allows consumption demand to be modelled as a function of an individual's characteristics (X_{it}), age (A_{it}), an individual fixed effect (w_i) and an expectational error term (u_{it}):

$$\ln C_{it} = b' X_{it} + g_1 A_{it} + \sum_{g=1}^{2} d_g G_i R_{it} + w_i + u_{it}$$

Note that wages are not included directly, but are assumed to be determined by the individual's characteristics and age. The expression for consumption given here also includes a variable, R_{it} for whether the individual is retired or not, and an identifier, G_i, denoting which of the two groups of retirees they belong to (G_i=1 if retirement is voluntary, =2 if retirement is involuntary). This interaction term is included in the estimation to capture the extent to which spending (differentially) changes at retirement for voluntary and involuntary retirees. If retirement is fully anticipated then, under the model specified above, there should be no change in spending since the effect of retirement would already have been captured in the (constant) marginal utility of wealth. But, if involuntary retirement results in a negative shock to wealth through loss of earnings or pension accrual, retirement will coincide with an expectational error that causes consumption to change. The interaction term is not intended directly to estimate the effect on consumption of retirement per se, but the extent to which retirement – and involuntary retirement in particular – is accompanied by an expectational error that results in a fall in spending. If the initial hypothesis is correct, there should be a significant fall in spending only where retirement is involuntary.

The assignment of individuals into groups of voluntary and involuntary retirees is somewhat akin to an instrumental variables approach. Ideally, what I would like to include in the regression is whether the individual experiences a negative wealth shock on retirement, but this is unobserved. Instead, I include a term if the retirement is involuntary, on the basis that this is likely to be correlated with any unobserved wealth shock. As the analysis in the previous section showed, involuntary retirement is more likely to occur as a result of ill-health or redundancy, both of which are likely to mean loss of earnings and/or pension accrual.

In order to interpret a significant coefficient on involuntary retirement as an indicator of a negative wealth shock, there can be no direct link between an individuals' self-reported employment state and their level of spending. Clearly, this may not be true in the case of ill-health which is linked to involuntary retirement and may also have a direct effect on spending. The regression therefore includes a number of variables which attempt to control for health status. It is assumed that other factors that may

result in involuntary retirements do not have a direct effect on spending other than through their effect on being retired.

Regression results

Table 4 reports the results from the fixed effects estimation. In all cases, retirement is included as a state variable (ie R = 1 if the individual is retired). Because the BHPS asks about "usual spending on food", it is likely that any reported change in food will be gradual and will be more likely to be picked up by the state variable than by a transition variable.[11]

The results in column (1) show that, for the sample as a whole, there is a small, insignificant fall in spending after retirement. Column (2) shows the effect of adding a dummy for involuntary retirement. The regression results confirm the preliminary findings from the previous section. The coefficient on retirement, capturing the change in spending associated with voluntary retirement, is insignificant, but for involuntary retirements the coefficient is negative and significant: Involuntary retirement is associated with a fall in food spending of around 11% and this is significantly different to what happens to spending when retirement is voluntary. This is consistent with the hypothesis that involuntary retirement is associated with a negative wealth shock that causes a fall in spending. It is interesting that the fall in spending for involuntary retirees occurs in spite of a significantly smaller drop in income (shown by the results in column (4)).

Table 4: Main regression results

Dependent variable	(1) Log food spending	(2) Log food spending	(3) Log food spending	(4) Log real income
Retired	-0.0178	0.0052	0.0062	-0.5681**
	0.0179	*0.0190*	*0.0189*	*0.0303*
Retired, Involuntary		-0.1036**	-0.0965**	0.1573**
		0.0297	*0.0295*	*0.0476*
Demographic controls	Yes	Yes	Yes	Yes
Health controls	Yes	Yes	No	Yes
N	2505	2505	2505	2505

Notes to table:
Demographic controls = household size, whether the respondent is divorced/widowed/separated, whether the spouse is working, age dummies
Health controls = whether the respondent has health problems, number of health problems (if health problems>0), whether health limits daily activities
Standard errors included in italics, ** denotes statistically significant at the 5% level (two-tailed tests)

[11] There is no significant change in reported usual food spending when retirement is included as a transition variable for any of the groups.

Controlling for health is particularly important since ill-health is a cause of involuntary early retirement and may have a separate direct effect on spending. The BHPS contains a large number of variables measuring individuals' health, but only a limited number of health variables in all ten waves (see Disney, Emerson and Wakefield (2003) for a more detailed analysis of health and labour market exit using the BHPS data). Here, two variables are used as controls for health status. One is the number of health problems reported by the individual in each year (out of a maximum of 13, including arms, legs and hands; sight; hearing; skin conditions/ allergy; chest/ breathing; heart/ blood pressure; stomach/ digestion; diabetes; anxiety/ depression; alcohol & drugs; epilepsy; migraine and other). The other is whether the individual reports that their health limits daily activities. This variable is not present in wave 9, but a value can be imputed on the basis of individuals' responses in waves 8 and 10.[12]

Column (3) reports regression results excluding these health controls for comparison, but there is little change in the results. If anything, poor health appears to be associated with an increase in food spending (possibly a substitution of home consumption for meals out) and the magnitude of the coefficient on involuntary retirement is slightly larger in absolute terms when health controls are included.

Robustness checks

As discussed above, there is an inevitable degree of arbitrariness in assigning individuals into groups of voluntary and involuntary retirees and this raises the possibility that the results may be partly driven by the chosen criteria. This is explored further by re-defining retirement as two consecutive periods out of work after age 50 (following at least one period observed in work). As before, individuals are assumed to retire voluntarily if they report themselves as retired and to be involuntarily retired if they report another non-working state, such as LT sick/ disabled or unemployed. The date of retirement is again taken to be the first period out of work. This is a less restrictive definition of retirement – there is no requirement that individuals do not re-enter work at a later date and there is no requirement (for involuntary retirees) that they self-report themselves as retired. Correspondingly, the sample size is slightly higher (325 retirements).

The fixed effects regression results incorporating this broader definition of retirement are reported in column (1) of Table 5. The basic result is the same; there is no significant change in spending if retirement is voluntary, but involuntary retirees do experience a significant drop in spending. Using this broader definition, however, the

[12] For individuals who report the same values in wave 8 and 10 this is fairly straightforward. Where there is a change between waves 8 and 10, the individual is assigned the value in wave 10 (where available), and otherwise the value in wave 8. It makes no difference to the results if, instead, the individual is assigned the value in wave 8 where available and wave 10 otherwise.

observed fall in spending is smaller – less than 7%. This is not surprising since this broader definition of retirement potentially allows people who are defined as retired to re-enter work and, correspondingly, experience a smaller loss of earnings/ pension accrual.

To explore this further, column (2) includes temporary spells out of work of not more than one period.[13] They too are associated with a significant fall in spending, but this drop is smaller again than in the case of spells of involuntary "retirement" of two or more periods out of work. Moreover, as shown in column (3), the drop in spending that occurs with a temporary spell out of work is more strongly linked to contemporaneous income. In general, these results imply that the more permanent the involuntary spell out of work (and the greater the loss of earnings and pension accrual), the larger the fall in spending.

Table 5: Robustness checks – definition of retirement

Dependent variable = (log) weekly real spending on food

	(1)	(2)	(3)
Retired	0.0043	-0.0138	-0.0065
	0.0169	*0.0144*	*0.0163*
Retired, Involuntary	-0.0674	-0.0549**	-0.0467*
	0.0246	*0.0243*	*0.0273*
Temporarily out of work		-0.0425**	-0.0172
		0.0217	*0.0242*
Log real income	No	No	Yes
Demographic & health controls	Yes	Yes	Yes
N	3300	3835	3835

Notes to table:
Demographic & health controls as in Table 4
"Retired" = two consecutive periods not in work
Standard errors included in italics
** denotes statistically significant at the 5% level, * at the 10% level (two-tailed tests)

An alternative explanation for why spending at retirement behaves differently for voluntary and involuntary retirees might be that it reflects, not a negative wealth shock associated with involuntary retirement, but some of the differences in their characteristics. To explore this, further regressions are run incorporating additional interaction terms to pick up differences in spending at retirement by, respectively, age of retirement, occupational pension status and educational qualification. The results are reported in Table 6. Note that the original, narrower definition of retirement is used.

[13] i.e. someone is not working in one period, but is in work in the periods immediately before and after

First, age of retirement. Involuntary retirees retire earlier, on average, than voluntary retirees. Column (2) in panel (a) reports the results when separate interaction terms are included for voluntary retirements that occur at age 65 (the state pension age) and after age 65. When these additional terms are included, and involuntary retirement is compared to voluntary retirements occurring at a similar age (ie before age 65), the coefficient on involuntary retirement becomes even larger (in absolute terms). Thus, the drop in spending when retirement is involuntary can not be attributable to the fact that people retire before the state pension age.

The results in column (1) in panels (b) and (c) lend support to the idea that the drop in spending among involuntary retirees may be linked to their lower level of occupational pensions and/or educational qualifications (the two are correlated). If no account is taken of whether retirement is involuntary or voluntary, changes in spending at retirement are strongly correlated with pension status and educational qualifications. Spending falls significantly at retirement if someone does not have an employer pension, but not if they do (column 1, panel b). Similarly, spending falls significantly at retirement for someone with no educational qualifications, but not for someone with qualifications (column 1, panel c).

But, if pension status is further interacted with voluntary/ involuntary retirement status, the results in column (2) show that whether or not retirement is voluntary or involuntary also matters. Within the group of men with no employer pension, it is only those who retire involuntarily who experience a significant fall in spending (panel b), while those who retire involuntarily and do have an employer pension experience a (smaller) fall in spending that is significant at the 10% level.

It is a similar story with educational qualifications. Within the group of men with no qualifications, it is only those who retire involuntarily who experience a significant fall in spending (panel b). In this case, however, there is no significant fall in spending among those who retire involuntarily and do have higher qualifications.

Table 6: Robustness checks – characteristics of retirees

Dependent variable = (log) weekly real spending on food

Panel a: Age of retirement		
	(1)	(2)
Retired	0.0052	0.0120
	0.0190	*0.0238*
Retired, Involuntary	-0.1036**	-0.1097**
	0.0297	*0.0325*
Retired at 65, Voluntary		-0.0119
		0.0398
Retired > 65, Voluntary		-0.0184
		0.0385
Demographic & health controls		Yes
Panel b: Employer pension		
	(1)	(2)
Retired	0.0019	0.0155
	0.0205	*0.0220*
Retired, No employer pension	-0.0516**	
	0.0262	
Retired, Voluntary, No employer pension		-0.0293
		0.0297
Retired, Involuntary, Employer pension		-0.0731*
		0.0376
Retired, Involuntary, No employer pension		-0.1732**
		0.0446
Demographic & health controls		Yes
Panel c: Qualifications		
	(1)	(2)
Retired	0.0047	0.0105
	0.0196	*0.0209*
Retired, No qualifications	-0.0701**	
	0.0250	
Retired, Voluntary, No qualifications		-0.0212
		0.0365
Retired, Involuntary, Qualifications		0.0273
		0.0471
Retired, Involuntary, No qualifications		-0.2317**
		0.0435
Demographic & health controls	Yes	Yes

Notes to table:
Demographic & health controls as in Table 4
Standard errors included in italics
** denotes statistically significant at the 5% level, * at the 10% level (two-tailed tests)

These results confirm that there is a significant difference in spending at retirement between voluntary and involuntary retirees. In cases where retirement is voluntary, there is little evidence to suggest that spending on food falls, even for those with no employer pension and no educational qualifications. But, the fall in spending associated with involuntary retirement is bigger for those with no employer pension (compared to those with an employer pension) and only significant for those with no educational qualifications (compared to those who do have educational qualifications). Both these characteristics are likely to reflect low levels of lifetime wealth, which may give individuals less of a cushion against negative wealth shocks.

4. Conclusions

The earlier UK study of consumption at retirement by Banks et al (1998) concluded that the "evidence strongly suggests that there are unanticipated shocks occurring around the time of retirement". Banks et al (1998) and Bernheim et al (2001) found a smaller drop in spending when retirement was anticipated, but the results depend on the validity of the instruments for retirement – lagged retirement and age respectively. This paper takes a different approach to looking at the effect of unanticipated early retirement and looks directly at the evidence on the nature of retirement. The main finding is that food spending only falls significantly when retirement is involuntary, occurring as a result of ill-health or redundancy for example, and not when retirement is voluntary. This finding is robust to alternative definitions of retirement and cannot be explained in terms of differences in pension status and levels of education between voluntary and involuntary retirees. But, among the group of involuntary retirees, those with no occupational pension experience a larger fall in spending and only those with no educational qualifications experience a significant fall in spending.

This main finding is consistent with the hypothesis that unanticipated early retirement is associated with a negative wealth shock that causes a drop in spending, in particular where lower levels of lifetime wealth mean that people are less able to cushion the effects of an adverse shock. The BHPS evidence suggests that up to 40% of men may retire involuntarily – defined by the reason given for early retirement or the route into retirement. Given the magnitude of the fall in food spending among involuntary retirees (between 7% and 11% depending on the definition used), this would be enough to explain the retirement-consumption puzzle (3% fall in total non-durable spending) observed in the earlier UK study.

The biggest limitation with this study is that it is restricted to food spending. If spending on a basic item such as food falls, then total spending is almost certain to fall, but the same cannot be said if food spending does not fall. The BHPS collects

information on two further items of personal spending – meals out[14] and leisure – but only in more recent waves and the sample sizes are not large enough to gain significant results. Nevertheless, the results of preliminary analysis of leisure spending are consistent with the main finding – spending on leisure falls by £3 a week when retirement is voluntary and by £15 a week when retirement is involuntary. As further waves of the BHPS become available, this is something to return to in the future.

Appendix

The table below provides further detail on how individuals are categorized as voluntary or involuntary retired. The sequence of employment states (work or non-work) in (up to) the five periods prior to the individual reporting themselves as retired is analyzed. If the individual is working in (at least) two consecutive periods immediately prior to retirement, they are classed as retiring voluntarily. If they experience a period of not-working immediately prior to retirement, but have previously been observed working, they are classed as retiring involuntarily.

Pre-retirement sequence W = working, NW = not working	Retirement type	Number of observations
W_W	Voluntary	49
W_NW	Involuntary	8
W_W_W	Voluntary	21
W_W_NW	Involuntary	6
W_NW_NW	Involuntary	5
W_W_W_W	Voluntary	20
W_W_W_NW	Involuntary	11
W_W_NW_NW	Involuntary	3
W_NW_NW_NW	Involuntary	2
W_W_W_W_W	Voluntary	133
W_W_W_W_NW	Involuntary	8
W_W_W_NW_NW	Involuntary	5
W_W_NW_NW_NW	Involuntary	4
W_NW_NW_W_W	Voluntary	2
W_NW_NW_NW_NW	Involuntary	5
NW_W_W_W_W	Voluntary	1
TOTAL		283

[14] "Meals out" include meals eaten at work and so is a heavily work-related item of spending.

References

Ameriks, J., Caplin, A. and Leahy, J. (2002) 'Retirement consumption: Insights from a survey' National Bureau of Economic Research Working Paper No. 8735

Banks, J., Blundell, R. and Tanner, S. (1998) 'Is there a retirement-savings puzzle?' *American Economic Review*, vol. 88 (4), pp. 769–88.

Bardasi, E., Rigg, J. and Jenkins, S. (2000) 'Retirement and the economic well-being of the elderly: A British perspective', ISER working paper 2000-33

Bernheim, D., Skinner, J. and Weinberg, S. (2001) 'What accounts for the variation in retirement wealth among US households?' *American Economic Review*, vol 91 (4) pp. 832–57

Blau, D (2004) 'Retirement and consumption in a life-cycle model', mimeo

Blundell, R. and Macurdy, T. (1999) 'Labor supply: A review of alternative approaches' in Ashenfelter, O. and Card, D. (eds) *Handbook of Labor Economics*

Blundell, R., Meghir, C. and Smith, S. (2002) 'Retirement incentives and labour supply in the UK' *Economic Journal*

Borsch-Supan, A. and Stahl, K. (1991) 'Life-cycle savings and consumption constraints: Theory, empirical evidence and fiscal implications' *Journal of Population Economics*, vol 4(3) pp. 233–55

Browning, M., Deaton, A. and Irish, M. (1985) 'A profitable approach to labor supply and commodity demands over the life-cycle' *Econometrica*, vol 53 (3) pp. 503–43

Disney, R., Emerson, C. and Wakefield, M. (2003) 'Ill-health and retirement in Britain: A panel data based analysis' Institute for Fiscal Studies Working paper No. 03/02

Disney, R. and Tanner, S. (1999) 'What can we learn from retirement expectations data?' Institute for Fiscal Studies Working Paper No. 99/17

Haider, S. and Stephens, M. (2004) 'Is there a retirement-consumption puzzle? Evidence using subjective retirement expectations' National Bureau of Economic Research Working Paper No. 10257

Hamermesh, D. (1984) 'Life-cycle effects on consumption and retirement' *Journal of Labor Economics* 2 pp. 353–370

Hurd, M. and Rohwedder, S. (2003) 'The retirement-consumption puzzle: Anticipated and actual declines in spending and retirement' National Bureau of Economic Research Working Paper No. 9586

Marmot et al (2004) *Health, wealth and lifestyles of the older population in England: The 2002 English Longitudinal Study of Ageing*

Miniaci, R., Monfardini, C. and Weber, G. (2003) 'Is there a retirement-consumption puzzle in Italy?' Institute for Fiscal Studies Working Paper No. 03/14

Tanner, S. (1998) 'The dynamics of male retirement behaviour' *Fiscal Studies*