

Involuntary Retirement and the Resolution of the Retirement-Consumption Puzzle*

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Abstract

A substantial body of international research has shown that household expenditure systematically decreases at the time of retirement – a finding that is inconsistent with the standard life-cycle model of income and saving if retirement is an anticipated event. This fall in expenditure has become known as the ‘retirement-consumption puzzle.’ We analyze HILDA panel survey data from waves 1 to 7 to assess the Australian evidence on the puzzle. We find strong evidence of a significant fall in expenditures on groceries, food at home and outside meals with retirement. The fall in expenditures is evident from a comparison by retirement status based on all households aged 45 years and over, and for the set of mature households attached to the labour market at the start of the observation period. The decline in groceries and food at home can be explained by households’ ability to enter retirement as anticipated, and coinciding with a rise in home-production and time-intensive activities. The decline in expenditures on outside meals reflects a change in life-style. Examining additional measures of household well-being, such as a series of financial hardship indicators and households’ self-reported financial and life satisfaction, are consistent with the finding of no significant change in economic welfare for the majority of retirees. However, for an important minority of households, retirement is ‘involuntary,’ resulting from long-term job loss or a negative health shock, and for these households retirement represents a significant wealth shock and decline in well-being.

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1 INTRODUCTION

As increasing numbers of workers approach retirement, an issue of growing importance for policy makers is whether households have sufficient savings to maintain their standard of living in retirement. A growing body of research, based on data from a variety of countries and time periods, has demonstrated that household expenditure systematically decreases at the time of retirement. This finding is inconsistent with the simplified life-cycle model of income and saving if retirement is an anticipated event. The sensitivity of expenditures to the timing of retirement has become known as the ‘retirement-consumption puzzle.’

In this paper we assess the Australian evidence on the retirement-consumption puzzle using HILDA Survey data from waves 1 to 7. The cross-sectional richness of the HILDA survey, combined with the survey’s longitudinal structure, allow us to consider several dimensions of the ‘puzzle’ while attempting to reconcile disparate finding in the literature. The main results from the analysis include that there is clear evidence of a fall in consumption, as proxied by grocery and food expenditure, upon retirement. However, this fall in most cases be explained by households being forced to retire due to previously unforeseen circumstances such as negative health shocks or long-term layoffs. Once we account for these factors, the retirement effect loses significance. The only components of food expenditure that fall with retirement are expenditures on meals away from home, and changes in this item are associated with changes in life style and time use following retirement, and do not reflect a decline in well being. We also find that retirement is associated with negative effects on individual household’s self-reported ability to ‘make ends meet’ as measured by their ability to pay bills or their need to ask for financial help from welfare or community institutions. For those indicators too, the strong negative effects of retiring unexpectedly seems to be a driving force behind apparent negative effect of retirement. These results are corroborated by an analysis of self reported levels of financial satisfaction and life satisfaction. Finally, we account for changes in households’ time use patterns following retirement as measured by their willingness to spend time on charitable work. We observe that retired households are more willing to engage in charitable activities, but that willingness is also negatively affected by unexpected retirement.

The structure of the paper is as follows. In the following section the international literature on the retirement-consumption puzzle is reviewed and used to place this study in context. In section 3 key aspects of the HILDA Survey data are outlined, and in Section 4 the estimation framework is briefly described. In Section 5 the empirical results are presented, and in Section 6 concluding comments are presented.

2 LITERATURE REVIEW

Standard life cycle theory of consumption predicts that a household’s consumption profile should not be affected by predictable changes in income. One important, and substantial, change in income is retirement. According to the simple one-good life-cycle model,

households will smooth their consumption over retirement through borrowing and saving activities. This prediction has been contradicted by many empirical studies that observed excess sensitivity of consumption to retirement; examples include the studies by Hamermesh (1984), Mariger (1987), Banks et al. (1998), Attanasio (1999), and Bernheim et al (2001). The fall of consumption coinciding with retirement is widely referred to as the “retirement consumption puzzle.”

That total expenditure falls with retirement is not a contentious assertion. Whether this fall reflects a fall in consumption, and possibly reflects a failure to adequately “plan ahead” on the part of the household, is much more contentious. The literature on this topic is rich, as illustrated in the recent survey by Hurst (2008). According to Hurst, several aspects of the puzzles can be reconciled with intertemporal optimizing behaviour. He argues that while certain types of expenditure fall with retirement, these are primarily work related expenditures and food. A decline in food expenditure may not reflect a decline in actual food consumption. The fall in expenditure tends to be most pronounced among the households with least wealth accumulated or when retirement is unexpected. The themes underlying this list of points serves as a useful way to organize the current state of the research literature.

2.1 Non-durable and Food Expenditures

Laitner and Silverman (2005) estimate a fall in total expenditure upon retirement of 16%. The commodity bundle is broader than non-durable goods (or finer components) usually examined in the literature. In addition, the magnitude of the decline is high relative to most other studies. Laitner and Silverman use repeated cross-sections of the United States Consumer Expenditure Survey (CEX) and adopt a specification that includes both age and retirement effects. These covariates, as discussed below, tend to be highly correlated and offset one another. Hurst (2008) suggests that the magnitude of the negative retirement effect is exaggerated by households with higher expenditures retiring later, causing the regression coefficient estimate on the retirement indicator to reflect a positive age effect among non-retired households. Fisher et al. (2008) also use the CEX but find much less evidence of decline in non-durable expenditure. They observe that most of the decline in non-durable expenditure (between about 1 and 3%) is predominately accounted for by expenditure on food at home and away from home (about 8% and 16% respectively).

Aguiar and Hurst (2007) take a more detailed look at changes in expenditure components upon retirement. They extend the analysis beyond the typically examined ‘total non-durable’ and ‘food’ expenditure categories. They look at finer non-durable expenditure components including entertainment, transportation, personal clothing and most notably charitable donations. They observe that while the fall in expenditure at retirement is evident at the mean of total non-durable expenditures, the changes to individual components range widely. The expenditures that can be thought of as complementary to working life style such as clothing and transportation fall, while expenditures on purely

leisure related commodities, for example entertainment and charitable giving, actually increase over the peak retirement age. Taken together their findings suggest minimal changes in living standards or well being over retirement. The observed change in expenditures may reflect substitutions to a more leisure-filled life style.

However Aguiar and Hurst (2007) also find a fall in food expenditure that at the aggregate level exceeds the amount that could be attributed to a change in lifestyle. Food is the most basic necessity and changes in actual food consumption likely reflect changes in well being. Research on expenditure patterns during retirement conducted on data from other countries reveals similar conclusions. Banks et al. (1998) working with UK family expenditure survey (FES) data, and Miniaci et al (2003) and Battistin et al (2009) working with Italian data, document that the fall in total expenditure over the peak retirement age occurs primarily among food and work related expenditures

Further disaggregation of food expenditure provides a much needed clarification. When expenditure on all food is disaggregated into finer categories the typical pattern that emerges shows a fall in expenditures on food consumed away from home and little change (and sometimes an increase) in food consumed at home; see, for example, Bernheim et al (2001), Aguiar and Hurst (2005) and Brzozowski and Lu (2010).

2.2 Distinction between Consumption and Expenditure

Food expenditure and consumption are not synonymous. Disaggregation of food expenditure, or even of actual consumption, into individual food categories may explain away part of the consumption puzzle. Aguiar and Hurst (2005) analyse actual consumption data in which they observe caloric and nutritional intake by individuals. They find the various quantity-based measures of consumption are not adversely affected by retirement, and therefore the fall in food expenditure does not result in a decline in either quantity or quality of food consumed. This results is rationalised by retired households affording higher food preparation efforts. Retired household do not face the trade-offs between time spent on market work versus home production. They can thus spend more time on food preparation and on shopping for low-cost food items. Brzozowski and Lu (2010) replicate Aguiar and Hurst (2005) using Canadian data and their conclusions regarding nutrition, food production and eating out habits are in line with those of Aguiar and Hurst (2005) for the US.

2.3 Population Heterogeneity

Bernheim et al. (2001) examine the distribution of changes in expenditure upon retirement. They divide households into four quartiles based on accumulated wealth prior to retirement. Their main result is that wealth plays an extremely important role in determining the severity a fall in expenditure upon retirement. Households in the wealthiest quartile experience a fall of about 9% in total expenditure. That figure increases to just under 14% for the two middle quartiles and to more than 30% for the least wealthy

quartile. Hurd and Rohwedder (2003) and Hurst (2006) observe similar patterns. These results suggest the intuitively obvious conclusion that those households which accumulated a large amount of wealth prior to retirement are well placed, while households with little or no accumulated wealth do not have the facility, to smooth their consumption over the retirement threshold.

2.4 The Role of Expectations

Whether retirement is anticipated, or unexpected, also plays a role in determining the changes in expenditure. Hurd and Rohwedder (2003) Smith (2006) and Haider and Stephens (2007) all find that households forced to take early retirement due to an unforeseen shock, typically illness or job loss, experience substantially greater falls in expenditure than households which retire according to a long term plan. The importance of unforeseen shocks triggering retirement is further confirmed by Hurst (2008) who examined the 1992 wave of the United States Health and Retirement Survey. When respondents are asked about changes in their standards of living after retirement, individuals who retired involuntarily are overrepresented among those who report a decrease in well being. Similarly, Alan et al. (2008) observe that Canadian households which retired involuntarily, especially due to health reasons, are much more likely to report dissatisfaction with their post-retirement financial situation than households who retired as planned.

Haider and Stephens (2007) also bring an important methodological innovation – they modify the typical functional framework of the expenditure regressions. Typically in these regressions (such as in Banks et al 1998 and Aguiar and Hurst 2005) the coefficient of interest, the coefficient on the retirement indicator variable, is instrumented by age of the individual. This procedure recognizes that the timing of retirement can be correlated with unaccounted for events that affect the household’s expenditure decisions, and the instrumental variable procedure assumes retirement plans are a function of age while expenditures per se are not. Haider and Stephens argue this is far from optimal, and when subjective retirement expectations are used as an instrumental variable (IV), some of their results suggest a minimal changes in food expenditures with retirement.¹ An alternative, though related, strategy to using retirement expectations as an IV is to use the information to construct a covariate indicating whether retirement is voluntary. This strategy was adopted in Smith (2006) is applied in this paper, whereby we explicitly account for differences between the effects of expected and unexpected, or involuntary, retirement. The indicator of involuntary retirement effectively captures a negative wealth shock at the point of retirement, signalling that households will need to adjust their optimal consumption path.

The research presented in this paper addresses the main themes in the literature. Using the HILDA survey data we examine non-durable expenditures; specifically groceries,

¹This result holds for one of the two surveys they use – results based on the second survey still show a fall in food expenditure.

and the sub-category of food purchased for consumption at home and expenditure on food purchased for consumption outside of home. We exploit the breadth of the HILDA survey by examining an array of alternative indicators of well-being - including examine indicators of financial hardship, which measure the difficulty families experience in ‘making ends meet.’ We also examine the impact of retirement on the less conventional indicators of well-being such as self-reported life satisfaction and financial satisfaction, as well as hours of charitable work. The rich content of the HILDA survey data enables us to control for important sources of heterogeneity across households, including crucial indicators of involuntary retirement, household wealth, health status and changes in health status over time, in to isolate the partial impact of retirement status. Further, the panel structure of the HILDA survey data allow us to control for additional forms of unobserved heterogeneity that may confound the observed impact of retirement on the economic well-being of households.

3 DATA AND SAMPLE CONSTRUCTION

The analysis focuses on the household expenditure items which are recorded in waves 1, 3-7 which were collected between 2001 and 2007.² The HILDA Survey has tracked approximately 7,000 Australian households, comprising 13,000 individuals, through time since the first wave collected in 2001. The survey data consists of a number of separate household and persons files. Individuals within the same household are linked within a wave, and individuals are tracked across waves.

The analysis sample was constructed through a sequence of steps. First, a household ‘reference’ person was defined for each household in wave 1. The reference person was selected by applying the following criteria in order: (i) one partner of a couple (ii) lone parent (iii) single person (iv) the person with the lowest ‘person number’ on the HQ.³ The household reference person from wave 1 was tracked across waves 3-7 to create a longitudinal record for the household. As a series of key questions on reasons for retirement, and retirement expectations, were only asked of persons aged 45 years and over we restrict the sample to households where the reference person is aged 45 years or older in the initial wave. To minimize the impact of major demographic changes on expenditure patterns, we further restrict attention to the subset of stable households which remained intact over the first seven waves of the HILDA Survey. Those restrictions result in a sample of 1517 household observations.

Part of the analyse is performed using the subsample of households where the reference person was aged 45 years or older and not retired in wave 1. This subsample represents the set of households ‘at risk of retirement’ during the observation period. This subsample provides a clearer picture of expenditure changes at the time of retirement. There are 770

²Wave 2 (2002) of HILDA did not collect household expenditure information.

³In the large majority of cases this method also selected the person who supplied most of the information recorded on the Household Questionnaire, which recorded the expenditure information up to wave 5.

households in this subsample. A comparison of spending patterns by retirement status based on the full sample may reflect differences between households at very distant points in their life cycles (for example, workers in their mid-40's relative to individuals in their late 70's who have been retired for over a decade). The 'at risk' sample allows us to track a more homogenous set of individuals as they make the retirement transition, which may more sharply highlight any discontinuity in spending at the time of the transition. We do not treat retirement as an 'absorbing state', in each survey year retirement status is determined based on current conditions and we allow for occasional exit from retirement.⁴

The key economic variable in the analysis is household expenditure on groceries, food at home (where available) and food purchased for consumption outside of the home. These items explicitly exclude spending on alcoholic beverages. The expenditure items correspond to usual spending over a week. Missing values for the expenditure items are imputed using regression methods. Each expenditure item is regressed on a series of indicator variables for the age of the household reference person, family type, number of children by age category, number of family members with chronic health conditions, indicators for location (state and regional or remote area) and a quadratic in disposable income, separately by year. The regressions are estimated using the sample of valid responses, and the estimates then used to generate predictions for observations with missing expenditure values. This imputation method is equivalent to assigning cell means to the missing values with the cells defined by the detailed set of explanatory variables in the regression.⁵ Nominal expenditures, and income, were inflated to 2007 prices using the national consumer price index.⁶

The grocery and food expenditure items measured across waves 1 and 3-7 in HILDA have potential limitations. The expenditure information in the HILDA Survey is collected through recall questions rather than using diary methods as applied in some specialized expenditure surveys such as the Australian Bureau of Statistics Household Expenditure Survey (HES). One concern is that recall data may be less reliable than that collected through the diary method. Results vary as to the extent of the difference. Some studies find the differences to be minimal, for example Browning et al. (2003) provide a comparison of 'food at home' expenditure recorded using recall and diary methods across a variety of Canadian surveys. They find that the information collected through interview recall questions is closely aligned with the information obtained through diary methods. Another issue is that the set of grocery and food expenditures measured across waves 1 and 3-7 in HILDA is more narrow than the set of nondurable commodities usually employed in distributional studies based on specialized expenditure surveys. Such studies typically includes expenditure on household utilities, such as fuel and telephone bills, and transport services. However, Browning et al. (2003) found that 'food at home' ex-

⁴Over the sample period, from 2001 and 2007, we observe 283 households enter retirement and 45 exit.

⁵The number of unique cells given by the set of discrete explanatory variables alone is 11,520, which allows for substantial variation in imputed values.

⁶Using a food-specific price series has no effect on the results of the empirical analysis.

penditure proved to be very useful in inferring total household nondurable expenditures. Furthermore, since much on the retirement-consumption puzzle literature has focused on relatively narrow food or grocery bundles, it is instructive to work with a comparable expenditure concept from HILDA.

A novel aspect of our analysis is our examination of the prevalence of financial hardship. The reference person's response to the following series of questions in the self-completion questionnaire are examined:

“Since January did any of the following happen to you because of a shortage of money:

- a. Could not pay electricity, gas or telephone bills on time,*
- b. Could not pay the mortgage or rent on time,*
- c. Went without meals,*
- d. Was unable to heat home,*
- e. Asked for financial help from friends or family,*
- f. Asked for help from welfare / community organizations.”*

An important feature of this question is the qualifier that the hardship arose from a binding resource constraint - *because of a shortage of money* - ruling out pure preference heterogeneity. The prevalence of an individual hardship is relatively low, and the various hardships are correlated, so we also consider composite measures such as an indicator of at least one hardship being experienced, and the total number of hardships experienced.

In addition we examine the effect of retirement on individual self-reported levels of general life satisfaction and financial satisfaction. We also a look at time used for charitable activities and document changes in behavior that are generally consistent with trends documented by Aguiar and Hurst (2005) and Brzozowski and Lu (2010) and reflect a lower relative price of time upon retirement.

The information on retirement status is taken from the individual's reported current labour market status. We define as retired those households where the reference person self-selects as retired, as well those where the reference person reports being out of work and unable to find employment for at least two years.⁷ An indicator of involuntary retirement is constructed from the information on the reason for leaving the last job. We consider two definitions. The first, 'strict' definition assigns the involuntary dummy equal to one to those households where the reference person was either laid off, left the job for medical reasons (sickness, disability, injury) or the individual was self employed and the business closed. The 'broad definition' also includes individuals who left the job for any reason other than planned retirement.⁸ Additional explanatory variables used in the analysis include self-assessed health status, self-assessed change in health over the previous year, number of persons in the household with chronic health conditions, family

⁷The 'long-term unemployed' component represents small component of the retirement group, and is less than 2% in any given wave.

⁸This definition includes among the involuntary retirees individuals who left temporary jobs, were unhappy with their last job, left in search of a better job, left due to pregnancy, to take care of family members including children and other changes of lifestyle.

structure, housing tenure and location.⁹

Descriptive statistics for the samples are presented in Table 1. The sample is a balanced panel with observations on 1351 households in the broad sample 770 in the ‘at risk’ sample for who we potentially observe a transition to retirement. For the full sample, the average age of the reference person in 2001 was 62.9 years, of who just under a half were retired. Conditional on retirement, the proportion involuntarily retired is 27% by the narrow definition, and 40% based on the broader definition. The majority of households were either single individual or couples without children - these two groups comprised more than 90% of observations. Average weekly grocery expenditures were \$126, of which approximately three-quarters represented expenditures on food at home. Grocery expenditures on average accounted for 13.5% of weekly disposable income. The proportion of families reporting financial hardship varies across the alternative indicators, ranging from a low of 2.1% for seeking help from a welfare or community organization, to a high of 9.2% reporting being late with payment of utility bills. The fraction of the sample that reports any of the six financial hardship is 15.8%. Summary statistics for the ‘at risk’ sample workers in 2001 show that, on average, this group is significantly younger, more likely to have dependents in the household, have better self-assessed health, higher incomes and expenditures though more likely to have experienced a financial hardship and marginally less satisfied with the life and financial situations, compared to the full sample.

It is instructive to compare summary statistics by retirement status. Table 2 presents sample means by retirement status and year. Not surprisingly, at a point in time, the set of retirees is significantly older - 13 years on average - than those still attached to the labour market.¹⁰ On average, net income is a substantial 44% lower among retirees compared to non-retirees in 2001. However, grocery expenditures are approximately 12% lower among retirees compared to non-retirees in 2001. Similar patterns are present in the final survey year for both the full and ‘at risk’ samples. The sample means indicate that retired households are less likely to experience hardship than working households. Self-reported levels of general and financial satisfaction with life also seem not to decline with retirement. While both groups rarely report low levels of either life or financial satisfaction (less than 5 out of 10), the proportion of households reporting very high levels (9+ out of 10) is considerably higher for retired than for working households.

⁹Additionally, a dummy variable equal to 1 if year equals 2006 or 2007 (and equal to zero otherwise) is included in groceries and food away from home regressions. This variable is included to account for changes in survey design starting in 2006 - the first year when household yearly rather than weekly expenditure was reported as part of the self-completion questionnaire.

¹⁰Health status is also not as highly self-assessed among the retirees, and the set of retirees are somewhat more likely to report a decline in their health over the previous year.

4 METHODS

4.1 Model

The modelling framework is based on the prototypical model of intertemporal consumer choice.¹¹ Individuals choose consumption (c_t) and leisure (l_t) to maximise the value functional

$$v(A_t, t) = \max \{U(c_t, l_t, \mathbf{x}_t) + \rho E[v(A_{t+1}, t+1)]\} \quad (1)$$

subject to the budget constraint

$$A_{t+1} = (1+r)(A_t + n_t + w_t h_t - c_t) \quad (2)$$

where \mathbf{x}_t is a set of exogenous characteristics, ρ is the consumer's discount rate, A_t is total wealth, r is the interest rate, n_t is non-labour income, w_t is the wage rate and h_t is hours worked in time period t . Solving for the first order conditions

$$\begin{aligned} U_c(c_t, l_t, \mathbf{x}_t) &= \lambda_t \\ \lambda_t &= \rho E_t[\lambda_{t+1}(1+r)] \end{aligned} \quad (3)$$

gives expressions for the marginal utility of consumption and the marginal utility of wealth. These conditions imply $U_c(c_t, l_t, \mathbf{x}_t) = \rho E_t[\lambda_{t+1}(1+r)]$ so that optimising individuals allocate consumption over time periods to that the marginal utility of consumption is equated to discounted expected marginal utility of wealth. The consumption demand function is implicitly defined as

$$c_t = C(\lambda_t, w_t, \mathbf{x}_t) \quad (4)$$

where consumption demand is function of current individual characteristics and the marginal utility of wealth which summarises all expected future information. The marginal utility of wealth will include the effect of retirement when it is fully anticipated.

Uncertainty is captured by innovations in the marginal utility of wealth over time. Individual consumption at a point in time can be expressed as a function of individual characteristics (w_t, \mathbf{x}_t), the marginal utility of wealth corresponding to an individual specific effect (α_i) and a random error term representing an expectations error (unanticipated wealth shock) in the current period (e_{it})

$$c_{it} = \mathbf{x}'_{it}\boldsymbol{\beta} + \alpha_i + e_{it} \quad (5)$$

4.2 Continuous Dependent Variables

The empirical implementation of the model for consumption expenditures is based on the random effects regression model with specification

$$\begin{aligned} \log(\text{consumption}_{it}) &= \beta_0 + \delta_1 \text{Retired}_{it} + \delta_2 \text{Involuntary}_{it} + x'_{it}\boldsymbol{\beta} + \alpha_i + e_{it}, \\ i &= 1, \dots, N; \quad t = 1, \dots, T \end{aligned} \quad (6)$$

¹¹For a more detailed exposition see, for example, Adda and Cooper (2003).

where x_{it} are observed explanatory variables, α_i is an individual specific variable and e_{it} is an idiosyncratic error term assumed to be independent of x_{it} and α_i . It is assumed that the unobserved individual specific variable α_i is independent of the included covariates, $E[x_{it}|\alpha_i] = 0$, and is distributed $N(\alpha, \sigma_\alpha^2)$. This corresponds to the random effects panel regression model. The coefficient on the *Retired* indicator, δ_1 , measures the proportional difference in mean consumption expenditures for retired households relative to working households, other things equal. The inclusion of the *Involuntary* dummy allows for separation of the effects of retirement itself from the effects of an expectations error due to an unanticipated negative wealth shock (such as illness or a long-term layoff) at the time of retirement. This specification follows Smith (2006) based on the marginal-utility-of-wealth-constant consumption demand function of Browning, Deaton and Irish (1985) and Blundell and Macurdy (1999). An implication of the life-cycle model is that there will be a significant decline in expenditures only when retirement is involuntary ($\delta_2 < 0$) and that retirement *per se* should be insignificant ($\delta_1 = 0$).

4.3 Discrete Dependent Variable

The random effect probit model is used for analyzing the effect of retirement on the various indicators of financial hardship. Given the binary nature of the outcome variable this corresponds to the model.

$$\Pr(\text{Hardship}_{it} = 1 | \text{Retired}_{it}, \text{Unexpected}, \mathbf{x}_i, \alpha_i) = \Phi(\beta_0 + \delta_1 \text{Retired}_{it} + \delta_2 \text{Involuntary}_{it} + x'_{it}\beta + \alpha_i + e_{it}), \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (7)$$

where α is the unobserved effect with $\alpha_i | \mathbf{x}_i \sim N(0, \sigma_\alpha^2)$.

Rather than present point estimates or the marginal effect $\partial P(y_{it} = 1 | \mathbf{x}_i, \alpha_i) / \partial x_j = \beta_j \phi[\mathbf{x}_i \boldsymbol{\beta} + \alpha]$ evaluated at $\alpha = 0$, which describes only a small part of the population (technically $Pr(\alpha = 0) = 0$) we present the average partial effect (APE) of a covariate on the expected probability of the outcome. The APE is found by integrating the marginal effect over the distribution of α in the population,¹² as detailed in Wooldridge (2002: 472).

5 EMPIRICAL RESULTS

5.1 Expenditure

5.1.1 Groceries

Table 3 presents the random effects regression results for the expenditure on groceries. The top panel presents results for the full sample of households where the reference per-

¹²Using the properties of the normal distribution and the law of iterated expectations it is possible to derive the APEs for the RE probit model. The APE for continuous x_j is $[\beta_j / (1 + \sigma_\alpha^2)^{1/2}] \phi[\mathbf{x}_t \boldsymbol{\beta} / (1 + \sigma_\alpha^2)^{1/2}]$ where ϕ is the normal PDF. For discrete x_j the APE is given by: $[\beta_j / (1 + \sigma_\alpha^2)^{1/2}] \cdot (\Phi[\mathbf{x}_t^1 \boldsymbol{\beta} / (1 + \sigma_\alpha^2)^{1/2}] - \Phi[\mathbf{x}_t^0 \boldsymbol{\beta} / (1 + \sigma_\alpha^2)^{1/2}])$ where Φ is the standard normal CDF, \mathbf{x}_t^1 is the vector of average values of \mathbf{x}_t except the j th element $x_j = 1$ and \mathbf{x}_t^0 has the j th element $x_j = 0$.

son is aged 45+ years in 2001 and use wave 1, 3-7 information. Model (1), in the first column of the table, is the baseline specification which includes the retirement status indicator and the full set of covariates (listed above) though excluding the indicator of retirement as voluntary or involuntary. The coefficient estimate on retirement implies that, conditional on the covariates, retired households on average spend approximately 2.6% less on groceries than households where the reference person is in the labour force. This coefficient is significant at 10% level.¹³ These estimates are mirror much of the previous literature on the retirement-consumption puzzle, and are consistent with lower average levels of consumption and well-being in retirement. The estimates of σ_α and σ_ε shows that the individual-specific component of the error term (random effect) is comparable to the idiosyncratic error, and the intra-household correlation $\rho = .458$ implies that, on average, there is relatively high autocorrelation in grocery expenditures.

Next, the involuntary retirement indicators were added to the specification. The strict or narrow definition of ‘involuntary’ retirement is included in Models (2), and the broad definition in model (3), respectively. In these models the coefficient on retirement indicator captures the effect of anticipated retirement status on household expenditures. The coefficient on the ‘involuntary retirement’ indicator then picks up the additional effect for retirees who exited the labour force due to an unexpected wealth shock. The estimates for these two models illustrates the central result of our paper. After accounting for reasons of retirement, we observe that the retirement indicator itself economic significance while the involuntary indicator is highly significant. Our results are in broad agreement with those of Smith (2006) for the UK. It appears that an key element of the retirement-consumption puzzle is the role of household expectations and the impact of an unanticipated shock precipitating retirement. Households which retire as planned on average tend not to experience a decrease in their expenditure on groceries in retirement. However, households forced into retirement either due to a long-term lay off or the onset of a major shock do respond by significantly lowering expenditures in retirement.

An alternative specification to models (2) and (3) is presented in model (4). Here the involuntary indicator is replaced by the number of years since retirement. Two competing hypotheses can motivate this specification. It may be that retirement per se constitutes a shock that takes time for households to fully adjust to, or it could be that upon entering retirement households begin to consume their savings and with time these savings run out. If the first hypothesis is true, then we should observe a positive coefficient on the number of years since retirement. If the second hypothesis is true then that coefficient should be negative. The coefficient on the number of years is statistically insignificant and the coefficient of the retirement dummy is largely unaffected relative to the base specification presented in model (1). It appears that neither hypothesised effect of time-retired is dominant.

¹³Without including any other covariates, the point estimate for the effect of retirement is -3.5%, and is statistically significant at the 5% level.

5.1.2 Food (At Home)

The sequence of models were then estimated with log-food expenditures as the dependent variable. Expenditure on food purchased for at home consumption is arguably a better measure of well being than expenditure on groceries. Unfortunately, last two waves of HILDA do not contain information on expenditure on food at home variable, hence there is some loss of precision due to the shorter observation period for food at home expenditures. The regression results are presented in second panel of Table 3, and are very similar to those reported for groceries. The estimated proportional drop in food expenditure at retirement is somewhat larger in magnitude for both the full sample, though broadly comparable, to that found for grocery expenditures. More importantly, for food at home just like for groceries the retirement consumption puzzle can be explained by whether the retirement was involuntary or not.

5.1.3 Outside Meals

Patterns of expenditure on food consumed away from home are not expected to react to retirement in a manner similar to food at home. Aguiar and Hurst (2005) and Brzozowski and Lu (2010) document that the drop in expenditure on food away from home is consistent with changes in lifestyle upon retirement. The lower panel of Table 3 strongly supports this hypothesis. There is a substantial difference in expenditures on outside meals by retirement status. The coefficient on the retirement dummy ranges from 0.66-0.76 indicating a very substantial drop in restaurant expenditure upon retirement. This drop is present regardless of covariates included. The addition of the involuntary retirement indicator in models (2) and (3) reduces the magnitude of the retirement effect by up to 10% but the coefficient remains highly significant and negative. The involuntary retirement coefficients themselves are not statistically significant.

The evidence across the three expenditure bundles is consistent with the international findings on the ‘retirement-consumption’ puzzle. The decline in non-durable expenditures with retirement is not an artefact from comparing households at disparate points in their life cycle. The decline in expenditures with retirement is robust across a variety of model specification. The decline in groceries and food at home can be explained by households’ ability to enter the retirement as desired rather than being forced into retirement by layoff or negative health shock. The decline in restaurant expenditure reflects the change in life style.

5.2 Financial Hardship and Life Satisfaction

The indicators of financial stress were then examined. These are direct indicators of well being. While other measures covered in this paper are effectively proxies for well being, it is difficult to argue the same about the indicators covered in this subsection. Inability to ‘make ends meet’ whether measured by incidence of going without meals or inability to pay for basic necessities such as housing or utilities are very strong and ob-

vious indicators of severe financial hardship. The panel random effects linear probability model estimates are presented in Table 5. Similar specifications to that used for analysing the effects of retirement on expenditures are implemented for the hardship measures.¹⁴ The results from this section generally reinforce the conclusions from the expenditure analysis above. We document the following pattern of results: (i) involuntary retirement strongly increases the likelihood of not being able to pay utility bills, this trend is present even though retirement itself has no significant effect on this ability, (ii) The likelihood of going without meals increases with retirement and can be entirely explained by whether retirement was planned or not, (iii) The likelihood of inability to heat home increases with retirement, and is even more pronounced when retirement is involuntary, (iv) Neither retirement nor planned retirement have any statistically significant effect on ability to pay mortgage or rent or on the need to ask for financial help from welfare or community organizations, and (v) Unexpected retirement appears to have a negative effect on the likelihood of asking for help from family, while the retirement itself has no significant effect. Only the last finding is difficult to reconcile with the trends we have documented so far. One way to explain this result is that retirees in financial trouble - often those who retired unexpectedly may be more able to access financial assistance from government and community organisations. This may be rationalised as a function of the coverage of Australian social safety net. Further, when we combine asking for help from both family and public institutions together we observe neither retirement per se or involuntary retirement significantly effects on this outcome variable. The third result listed above is also somewhat puzzling. While it makes sense that the unexpected retirement increases the likelihood of not being able to heat home, it is difficult to explain while the retirement effects persists even if we account for expectations error. This finding may be a reflection of the over-consumption of housing services by the elderly. Features of the Age pension means test, and capital gain tax, significantly favour investment in owner-occupied housing. Elderly households may be over-consuming housing, with one potential implication that they lack resources to adequate heat, and maintain, that asset.

One issue with analyzing each hardship indicator separately is their low incidence for both retired households and those with the labour force. There is the further issue that the hardship outcomes are likely correlated. To address these issues we examined alternative combinations of the hardship indicators. First we run random effects probits for the incidence of any hardship. Second we run regressions on a hardship index which a simple count of hardships suffered by the household. Results for those models are presented in the top panel of Table 5. For the probit on any hardship we observe no effect of retirement itself, however we observe a strongly significant 3% increase by in likelihood of suffering any hardship due to involuntary retirement. No significant effects of either retirement itself or the unexpected retirement are evident from regressions on hardship index. The results for the ‘at risk’ sample for the any hardship probit and the

¹⁴In this paper we only report results for models (1) and (2), results for the remaining models are available from the authors upon request.

hardship index regressions are similar.

As an alternative to hardship indicators we look at self-reported measures of satisfaction with financial satisfaction and with life in general. HILDA respondents were asked to rank how satisfied they are with their lives and their financial situation on the scale of zero to ten (ten being the highest). The lower panels of Table 5 contains these results. We report models (1) and (2) for both the full and the ‘at risk’ samples. First we consider self-perceived financial satisfaction. Full sample households report a significant and substantial fall in financial satisfaction following retirement (model 1), while ‘At risk’ households report no such fall (model 3). This may be reflected by the size of saving reserves left available to households since retirement. Again, for any survey wave, retired ‘at risk’ households are retired on average for much shorter period than full sample households. Models (2) and (4) include the involuntary retirement dummy. The effect of unexpected retirement on financial satisfaction is strongly negative in both samples. Moreover, once the unexpected retirement dummy is included in the regression, the significant negative effect of retirement from the full sample disappears.

Turning to satisfaction with life in general, we observe that retirement has no direct effect on the overall life satisfaction. This can be reconciled with the results for financial satisfaction as the latter is a much narrower domain and only one component of life satisfaction. However, if households, in either sample considered, were forced to retire involuntarily then there is a clear decrease in self-reported life satisfaction.

Evidence collected in this subsection confirms general trends as documented by Hurst (2008) and Alan et al (2008). An ability to retire as planned is crucial for households’ post retirement well being. If households are constrained and retirement by an unexpected work or health shock, their standard of living tends to suffer.

5.3 Charitable Behaviour

A look at changes in charitable behavior offers another angle for the analysis of retirement effects on the standard of living. Aguiar and Hurst (2007) observe that charitable giving increases over the retirement age. While we lack information on charitable donations, HILDA includes data on time devoted to charitable activities. For people in the labor force charitable efforts involve the same trade-offs as trade-offs between labour and leisure. Retired households do not face such trade-offs. It is therefore natural to expect that retired households will be more engaged in charitable behavior. On the other side we have already documented that in this paper that unexpected retirement has negative consequences on the standard of living. It is reasonable to speculate that households which retire unexpectedly may be less willing and indeed less able to give to others. Reasons for this may be numerous. Disability is potentially a the key factors behind unexpected retirement. Those who are disabled may be unable to help others despite being interested in doing so. Moreover volunteering time for charity may be bundled with volunteering funds. Retiring unexpectedly may also affect psychological well being. If, as demonstrated in the preceding section, those who retire unexpectedly enjoy lower

satisfaction with life, they are more likely to suffer from stress and their concerns with own well being may divert attention from the well being of others. Table 6 covers these results. Again we report models (1) and (2) for full and ‘at risk’ samples. Retirement has a significant positive effect on time devoted to charitable activities in all models. The measured magnitude of effect increases once we account for unexpected retirement which has a strong negative effect.

6 CONCLUSION

Taken together our results combine into a consistent explanation of ‘retirement consumption puzzle’ and paint a multidimensional picture of retirement effects on well-being. The hypothesis of retirement in general having adverse effects on Australian standards is generally refuted. Households that choose to retire on their own terms tend not to suffer negative consequences. However, households that are forced into retirement due to job loss or health shocks experience a decline in their standard of living.

From the analysis of expenditures among mature households using HILDA survey data for waves 1-7, it is clear that there is an economically significant decline in expenditures on groceries and food with retirement. Conditional on a rich vector of covariates, there is approximately a 3%-5% fall in spending on groceries, and 3-6% fall in spending on food following the transition to retirement. The decline in expenditures among Australian households is comparable to that found for other countries including the US, UK and Italy. The magnitude of the apparent fall in expenditures is sensitive to choice of samples. Larger in absolute magnitude effects of retirement are observed for the ‘at risk of retirement’ sample that consists of households employed at the beginning of the survey. Sensitivity analysis reveals that the observed retirement effect is in fact the effect of retiring involuntarily - households that retire as planned report no statistically significant changes in expenditure on groceries or food at home. No such patterns are evident from the analysis of food consumed away from home - here the significant fall in expenditure persists even after the inclusion of the involuntary dummy. We interpret this finding as consistent with the change with life style following retirement and not reflective of a welfare decrease.

The analysis of severe financial hardship indicators and self assessed measures of life satisfaction broadly supports the conclusions we reach for expenditure. Retirement is associated with an increase in incidence of some measures of financial hardship but not others. When present initially, the retirement effect, can be fully accounted for the by the involuntary component. The inability to heat home, provides one exception to this rule, here the retirement effect persists even after we account for the involuntary dimension, which we hypothesises may be related to over-consumption of housing services by the elderly. The analysis of general life satisfaction and financial satisfaction strongly supports these general findings for the more traditional measures of well-being. Here too the apparent retirement effect can be attributed to households being forced into

retirement and not retiring when previously planned. Analysis of charitable behavior yields a similar conclusion. Intensity of charitable efforts increases with retirement but decreases when the retirement is involuntary.

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Table 1. Summary Statistics - Balanced Panel, Wave 1 Characteristics

	Broad Sample	'At Risk' Sample
Age (years)	62.89	56.71
Female	0.417	0.392
Retired	0.492	0.00
<i>Involuntary Retirement 1</i>	0.133	0.00
<i>Involuntary Retirement 2</i>	0.200	0.00
Net Income (2007\$)	943.00	1294.24
<i>Expenditure</i>		
Groceries	125.74	135.48
Food at home	94.99	103.05
Food outside home	32.01	40.40
<i>Financial Hardship</i>		
Late utilities	0.09	0.11
Late rent / mortgage	0.04	0.05
Miss meals	0.03	0.03
Lack heating	0.03	0.02
Financial help from family	0.06	0.07
Help from welfare organisation	0.02	0.03
Any Financial Hardship	0.158	0.182
Hardship Index (0,6)	0.272	0.313
<i>Time Use</i>		
Hours of charitable work	1.42	1.05
Hours of caring for disabled	0.74	0.84
Hours household errands	4.75	4.32
Hours housework	10.78	9.71
Hours outdoor tasks	6.70	5.86
Life Satisfaction (0,10)	8.224	8.084
Financial Satisfaction (0, 10)	6.58	6.45
<i>Family type</i>		
Single	0.435	0.382
Couple, no kids	0.489	0.497
Couple, kids	0.044	0.082
Lone Parent	0.002	0.004
Other	0.030	0.035
Household size	1.70	1.86
Persons with chronic health	0.373	0.309
<i>Self assessed health:</i>		
excellent	0.096	0.117
very good	0.285	0.335
good	0.345	0.348
fair	0.190	0.143
poor	0.049	0.033
missing	0.034	0.025

Change in health over past yr

Much better	0.049	0.060
Somewhat better	0.076	0.082
Same	0.679	0.700
Somewhat worse	0.144	0.122
Much worse	0.015	0.008
missing	0.038	0.029
Observations	1517	770

Table 2. Summary Statistics - Balanced Panel

	2001		2007		'At Risk' Sample in 2007	
	Not Retired	Retired	Not Retired	Retired	Not Retired	Retired
Age	56.71	69.27	60.90	73.21	59.92	67.51
<i>Retirement Status</i>						
<i>Involuntary 1</i>		0.270		0.256		0.209
<i>Involuntary 2</i>		0.407		0.353		0.254
Net Income	1294.24	580.95	1519.13	669.83	1596.70	812.88
<i>Expenditure</i>						
Groceries	135.48	115.69	151.30	126.33	154.96	130.23
Food at home	103.05	86.68				
Food outside home	40.40	23.36	48.38	38.03	49.41	49.76
<i>Financial Hardship</i>						
Late utilities	0.108	0.076	0.077	0.047	0.080	0.039
Late rent / mortgage	0.051	0.024	0.038	0.016	0.039	0.011
Miss meals	0.030	0.025	0.023	0.013	0.023	0.021
Lack heating	0.025	0.033	0.011	0.026	0.008	0.021
Fin help from family	0.071	0.055	0.058	0.031	0.055	0.057
Help from welfare org	0.029	0.015	0.024	0.013	0.027	0.007
Any Financial Hardship	0.182	0.134	0.122	0.086	0.121	0.085
Hardship Index (0,6)	0.313	0.229	0.231	0.147	0.232	0.155
<i>Time Use</i>						
Hours of charitable work	1.045	1.797	0.934	1.254	0.850	1.696
Hours of carrying for disabled	0.838	0.639	1.618	0.934	1.450	1.611
Hours household errands	4.323	5.189	3.517	4.695	3.655	5.555
Hours housework	9.712	11.890	8.451	10.504	8.464	11.152
Hours outdoor tasks	5.864	7.564	4.774	6.494	4.774	8.424
Life Satisfaction (0,10)	8.084	8.366	8.048	8.215	8.051	8.180
Financial Satisfaction (0, 10)	6.422	6.707	6.756	7.224	6.755	7.112
Observations	770	747	532	985	487	283

Table 3. Family Expenditure and Retirement Status¹

	(1)	(2)	(3)	(4)
Dependent Variable: Log(Grocery Expenditure)				
Retired	-0.0260 (0.0123)	-0.0173 (0.0134)	-0.0120 (0.0138)	-0.0238 (0.0129)
Involuntary		-0.0320 (0.0194)	-0.0390 (0.0169)	
Years since retirement				-0.0004 (0.0006)
δ_α	0.290	0.290	0.290	0.290
δ_ε	0.315	0.315	0.315	0.315
ρ	0.458	0.458	0.458	0.458
R ²	0.344	0.344	0.345	0.344
<i>t</i>	6	6	6	6
<i>i</i>	1517	1517	1517	1517
Dependent Variable: Log(Food at Home Expenditure)				
Retired	-0.0340 (0.0175)	-0.0195 (0.0191)	-0.0003 (0.0201)	-0.0300 (0.0182)
Involuntary		-0.048 (0.0247)	-0.075 (0.0220)	
Years since retirement				-0.0007 (0.0008)
<i>i</i>	1517	1517	1517	1517
Dependent Variable: Log(Food Outside Home)				
Retired	-0.0760 (0.0227)	-0.0660 (0.0246)	-0.0700 (0.0253)	
Involuntary		-0.035 (0.0342)	-0.015 (0.0299)	
<i>i</i>	1517	1517	1517	1517

1. Covariates include controls for state of residence, sex, educational attainment, family type, number of adults in the household, and change in health status over the previous year.

Table 4. Family Expenditure and Retirement Status, 'At Risk' Sample

	(1)	(2)	(3)	(4)
Dependent Variable: Log(Grocery Expenditure)				
Retired	-0.0470 (0.0151)	-0.0440 (0.0168)	-0.0390 (0.0176)	-0.0470 (0.0163)
Involuntary		-0.0261 (0.0332)	-0.0234 (0.0258)	
Years since retirement				0.0000 (0.0011)
δ_α	0.297	0.297	0.297	0.297
δ_ε	0.304	0.304	0.304	0.304
ρ	0.488	0.489	0.488	0.488
R ²	0.370	0.370	0.370	0.370
<i>i</i>	770	770	770	770
Dependent Variable: Log(Food at Home Expenditure)				
Retired	-0.0570 (0.0228)	-0.0300 (0.0257)	-0.0021 (0.0285)	-0.0580 (0.0244)
Involuntary		-0.105 (0.0455)	-0.130 (0.0401)	
Years since retirement				0.0001 (0.0015)
<i>i</i>	770	770	770	770

1. Covariates include controls for state of residence, sex, educational attainment, family type, number of adults in the household, and change in health status over the previous year.

Table 5. Retirement and Well-Being

	(1)	(2)	(3)	(4)
Outcome	Any Hardship	Any Hardship	Hardship Index	Hardship Index
Retired	0.0114 (0.0084)	0.0001 (0.0093)	0.0273 (0.0205)	0.0223 (0.0221)
Involuntary		0.0320 (0.0118)		0.0191 (0.0323)
Sample	Full	Full	Full	Full
Satisfaction:	Financial	Financial	Financial	Financial
Retired	-0.0990 (0.0558)	0.0112 (0.0610)	-0.0354 (0.0707)	0.0347 (0.0787)
Involuntary		-0.4150 (0.0934)		-0.2880 (0.1417)
Sample	Full	Full	'At Risk'	'At Risk'
Satisfaction:	Life	Life	Life	Life
Retired	0.0419 (0.0405)	0.0740 (0.0443)	0.0071 (0.0489)	0.0327 (0.0545)
Involuntary		-0.1180 (0.0654)		-0.1620 (0.0977)
Sample	Full	Full	'At Risk'	'At Risk'

1. Covariates include controls for state of residence, sex, educational attainment, family type, number of adults in the household, and change in health status over the previous year.

Table 6. Retirement and Time Use

	(1)	(2)	(3)
Outcome	Hours Charity	Hours Charity	Hours Charity
Retired	0.6670 (0.1469)	0.7890 (0.1600)	0.720 (0.1637)
Involuntary		-0.4560 (0.2360)	-0.1506 (0.2055)
Sample	Full	Full	Full
<i>Hours of carrying for disabled</i>			
Retired	-0.0724 (0.2258)	-0.1415 (0.2476)	-0.135 (0.2537)
Involuntary		0.2690 (0.3955)	0.1870 (0.3433)
Sample	Full	Full	Full
<i>Hours Household errands</i>			
Retired	0.7200 (0.1773)	0.7910 (0.1924)	0.805 (0.1964)
Involuntary		-0.2628 (0.2751)	-0.2414 (0.2396)
Sample	Full	Full	Full
<i>Hours Housework</i>			
Retired	1.6750 (0.3237)	1.6680 (0.3529)	1.420 (0.3605)
Involuntary		0.0293 (0.5199)	0.7271 (0.4519)
Sample	Full	Full	Full
<i>Hours Outdoor Tasks</i>			
Retired	1.8160 (0.2528)	2.0180 (0.2752)	2.218 (0.2812)
Involuntary		-0.7690 (0.4095)	-1.1570 (0.3554)
Sample	Full	Full	Full

1. Covariates include controls for state of residence, sex, educational attainment, family type, number of adults in the household, and change in health status over the previous year.