Consumption, Retirement and Life-cycle Prices: Evidence From Spain*

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Abstract

Evidence from several countries reveals a substantial drop in household consumption around retirement age that some researchers believe is difficult to reconcile with standard life-cycle models. Using detailed expenditure data from a Spanish panel survey, we find no evidence of a consumption-retirement puzzle in Spain for the period of 1985–2004. However, we find a drop in food expenditure at home from 1998 to 2004 and evidence on households paying lower prices for the food they purchase after retirement in this latter subperiod. We argue our findings are consistent with a model that allows for home production whereby retirees substitute away from market goods to food home production, as long as one accounts for the increase in female labor participation that took place during this period which has lead to greater participation in housework by men after retirement coinciding with the latter period of the survey.

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1 Introduction

We use a rich and unique longitudinal expenditure survey from Spain to study how consumption changes around retirement. Households appear to reduce expenditure substantially around the age of retirement. This pattern has been documented for the US (e.g., Hamermesh 1984, Mariger 1987, Bernheim, Skinner, and Weinberg 2001), for Canada (e.g. Robb and Burbidge 1989), for the UK (e.g. Banks, Blundell, and Tanner 1998), for Italy (e.g., Miniaci, Monfardini, and Weber 2003, Brugiavini, Battistin, Rettore, and Weber 2007), and for Germany (e.g., Schwerdt 2005) among other countries. The decline takes the form of a discrete drop in the year of retirement or around retirement. This behavior has been labeled puzzling because life-cycle consumption models predict that households want to smooth consumption (or rather, the marginal utility of consumption) when they experience a predictable drop in income, as at retirement. Understanding the cause of this expenditure drop is important both to researchers who are trying to analyze how individuals make complex decisions when the future is uncertain, and to policy makers who are concerned about the adequacy of savings for retirement.

Researchers have attributed the consumption drop at retirement to various causes (for a literature review, see Hurst 2008). Bernheim, Skinner, and Weinberg (2001) argue that myopic or rule-of-thumb behavior is responsible for the drop in expenditure upon retirement, and Angeletos, Laibson, Repetto, Tobacman, and Weinberg (2000) show that a suitably calibrated model with hyperbolic discounting can account for the consumption drop around retirement in the US case. These papers imply that households are not saving enough for retirement. Smith (2006) finds that unexpected negative shocks around the age of retirement (such as health problems) can account for the consumption drop. In fact, she finds a drop in U.K. food expenditure only for households who retire involuntarily due to unexpected shocks. Banks, Blundell, and Tanner (1998) study non-separabilities between leisure and consumption: a consumption drop at retirement does not necessarily imply lower marginal utility if leisure is increasing at the same time. Hurd and Rohwedder (2004) point out that market goods are just one of the inputs that enter a household's production function of consumption and document that retirees spend more time on home production. Aguiar and Hurst (2005) show that a drop in food expenditure is not associated to a drop in food intake, and Aguiar and Hurst (2007a) find that individuals shop more frequently and pay lower prices for the same products latter in life, both consistent with a home production story. In summary, conventional economic theory (properly augmented) can

provide an explanation for the drop in expenditure around retirement as well.

The ideal dataset to study the so-called consumption-retirement puzzle would be a longitudinal dataset that tracked households over an extended period of time and had detailed information on different expenditures categories. Due to lack of data, much of the previous literature has focused on food expenditure (as well-known longitudinal studies such as the Panel Study of Income Dynamics, PSID, or the British Household Panel, BHPS, record mainly food purchases) or has relied on repeated cross sections using synthetic cohort analysis. We work with a very rich longitudinal study, the Spanish expenditure survey. This survey is a rotating panel that follows households for up to eight quarters. Given the panel nature of the data, we are able to observe expenditure changes for the same household (rather than across households), and the data are sufficiently detailed to analyze changes in expenditure for a broad selection of goods and services. In our analysis, we use data from 1985 to 2004. The expenditure survey significantly changed its methodology in 1997 and we report results from the earlier years (1985–1997) and the later years (1998–2004) separately in some cases.

First, we document that nondurable expenditure inclusive of work-related categories decreases slightly at retirement but we find no such drop for an expenditure measure which excludes those expenses or for total expenditure. Households retiring involuntarily due to negative health shocks, however, do decrease expenditure at retirement for a widespread range of expenditure measures. Overall, these results are consistent with a life-cycle model. The fact that we fail to find a drop of nondurable expenditure at retirement stands out when compared to most of the international evidence. Our findings are, however, consistent with Aguila, Attanasio, and Meghir (2008), who use the panel component of the Consumption Expenditure Survey (CEX) in the US and find no decrease of nondurable expenditure at retirement.[1] However, those authors still find a drop in food expenditure at retirement (at home and away from home) and argue that the home production hypothesis of Aguiar and Hurst (2005) and Hurd and Rohwedder (2004) is the right explanation for the retirement-consumption puzzle. When focusing on food, we find a decrease on total food expenditure and a drop in food expenditure at home in the latter years of the survey only.

We investigate the home production explanation in Spain by distinguishing between households with and without dedicated homemakers. If a household member other than the head

[1]Stephens and Unayama (2008) also find little evidence of a change in consumption at retirement in Japan, mainly due to the fact that many Japanese workers receive bonuses at retirement.

specializes in home production, then the head retiring may not lead to the "better" shopping and additional cooking that could result on savings in food at home and away from home, unless the head gets involved in housework after retirement. We find that only households without a homemaker reduce spending on food at home at retirement in the earlier years of the ECPF. In the latter years of the survey, however, we observe that having a household member that identifies himself/herself as a homemaker makes little difference for food expenditure patterns at retirement, finding a widespread drop in food expenditure across all household types. We conjecture that the difference in the behavior of food spending around retirement in both periods has to do with changes in the division of labor within the household and an increase in men's participation in home production activities (before and/or after retirement) in the latter period of the survey.

The Spanish expenditure survey contains information on quantities purchased (in addition to expenditure) for a broad range of food items. Using this information, we construct household-specific price indices as in Aguiar and Hurst (2007a) and investigate whether households pay lower prices as they age and during retirement years. In line with the home production model, evidence on retirees paying lower prices would suggest a higher shopping intensity and a substitution of market goods (such as more expensive prepared meals) for time in home production (such as cheaper home-made meals). We also have information on the number of meals consumed at home (for the latter years only) and complementary information on time use for home production can be obtained from the 2002 Spanish Time Use Survey (which best corresponds to the latter years of the expenditure survey). Consistent with the U.S. evidence, we find that older households pay less for the basket of goods they purchase as they age. However, we only find significant differences in paid prices around retirement ages for the latter period of the survey. For this latter period, we also show that the number of meals at home increases as individuals age, and that there is a reallocation of time between men and women suggesting a more efficient division of labor at older ages. This evidence is consistent with the decrease in total food spending being due to a substitution of restaurant meals for home meals, and the decrease in the cost of the food basket for retirees being due to more intensive shopping. All in all, the results derived from the extra information on actual expenditure and time-use patterns provides further support for the home production story as the right explanation for the consumption-retirement puzzle.

This paper is organized as follows. Section 2 describes the dataset. Section 3 documents

how spending changes upon retirement in Spain. Section 4 investigates the home production model. Section 5 concludes.

2 The Spanish Expenditure Survey

We use a household-level data set of quarterly spending called "Encuesta Continua de Presupuestos Familiares" (ECPF hereafter). The ECPF is a rotating panel conducted by the Spanish National Institute of Statistics (INE). Out of the approximately 3,100 to 4,000 households interviewed each quarter, one eighth is renewed every quarter. As a result, we follow many household for up to eight consecutive quarters. The ECPF overcomes some shortcomings of other panel data sets such as the PSID or the BHPS because it contains very detailed and comprehensive information on expenditure (not just food) as well as other demographic and economic variables. Since households are followed for a longer period than households in the CEX, we can take advantage of a true (although short and unbalanced) panel structure. The long time series over which this data is collected is also useful (we have data from 1985 to 2004) as it covers a period of rapid economic and social change in Spain. Unique to our data set is the availability of information on quantities purchased (in addition to expenditure) for a broad range of food items, along with information on meals consumed at home (for the latter period), which allows us to study the relationship between expenditure and home production.

We utilize two distinctive periods of the survey. The first period covers 1985:1 to 1997:2 (ECPF-85), while the second period goes from 1997:4 to 2004:4 (ECPF-97).[2] The aim of both surveys is the same (the construction of weights for the Spanish CPI) but important methodological changes were introduced in 1997. The most relevant change for our analysis is the introduction of two modes of "collaboration" in the latter years. Whereas in the ECPF-85 households record expenditures on all categories each quarter, in the ECPF-97 households only report on all expenditure categories in quarters under *strong collaboration* (G), but report on selected categories of goods and services in periods of *weak collaboration* (g). In particular, a given household only keeps track of expenditures on goods and services that are not typically bought weekly when in weak collaboration mode.[3] With this change, the INE wanted to limit

[2]Several researchers have used the ECPF-85 to address a variety of topics. For example, Browning and Collado (2001) find no excess sensitivity of consumption to large and predictable income changes associated to bonus pay in Spain, while Carrasco, Labeaga, and López-Salido (2005) study habit formation.

[3]In the ECPF-85, the method for collecting information on expenditures is mixed. First, households are asked to record directly all spending during a reference week in a diary provided by the INE. An interviewer also leaves behind a form for households to record expenses outside the reference week on good and services not typically

survey fatigue while still getting accurate numbers for expenditures on non-everyday items. The typical sequence of collaboration for a household is G G g g G G g g. Because of this sequencing, one cannot compare consecutive growth rates of consumption for a given household.[4] Sample sizes are generally bigger in the most recent years (3,100 vs. 4,000 households), and although the ECPF-97 contains richer demographic information on each household member, the information on household income is particularly poor as is only reported in intervals—the ECPF-85 contains income information for several household members.

Pou and Alegre (2002) document that total expenditure in the ECPF-85 accounts for 79.9 percent of consumption in the Spanish National accounts. By categories, food, housing, and clothing are particularly well represented (the ECPF-85 accounts for 90 percent or above of the National Account numbers), while medicines and other goods and services are less so (roughly 40 percent). Income levels are systematically much lower than the corresponding figures in the National Accounts, about 65.1 percent. (Earnings are better captured than capital income, accounting for 69 percent and 15 percent, respectively, of the corresponding figures in the National Accounts.) Growth rates in the ECFP-85 and the National Accounts are practically the same for both income and total expenditure, which suggests that underreporting has been constant over time.[5]

Expenditure over the life cycle

Figure 1 depicts life cycle profiles for several expenditure categories using data from the ECPF for households with heads aged 30–75. To construct the figure, we run regressions of the form:

$$\log C_{it} = \alpha + \beta_{age}\, Age_{it} + \beta_c\, Cohort_{it} + \beta_f\, Fam.Composition_{it} + \varepsilon_{it},$$

where C_{it} is real expenditure for household i in period t, Age_{it} is a vector of 45 one-year age dummies for the household head, $Cohort_{it}$ is a vector of nine 5-year birth cohort dummies and

purchased on a weekly basis, and comes back to meet the household member who runs the household to complete a detail questionnaire about spending on a given month or quarter for these items based on the form and recall information.

[4] Another relevant methodological change is that in the ECPF-97 expenditures are recorded upon the acquisition of goods and services, rather than at the moment of payment (which may occur in the future). This is especially relevant for items which are paid in installments, and avoids possible measurement error due to retrospective thinking by respondents. There is also a different classification of expenditure categories in both waves. (PROCOME in ECPF-85 vs. COICOP/HBS in ECPF-97.)

[5] The ECPF-97 accounts for roughly 85 percent of consumption in the National Accounts. Income information is very limited in the ECPF-97 to perform comparisons. (Authors calculations available upon request.)

$Fam.Composition_{it}$ is a matrix of variables to control for household composition (including 14 household size dummies, a married dummy, a homemaker dummy and dummies for the presence of children less than 5, 5–12, and 13–18 years old). The specification also includes quarter dummies to control for seasonality. Figure 1 plots the estimated coefficients for the age dummies (the solid lines are 5-year moving averages), and can be seen as log-deviations in expenditures from households with heads who are 30 years old or less. In panel (a) we present total expenditure, nondurable expenditure, and nondurables minus housing services.[6] In panel (b), we plot total food expenditure and food at home.[7]

The expenditure patterns depicted in Figure 1 deploy the usual hump shape generally found for life-cycle expenditure profiles. Using the ECPF-85, we find that total expenditure (nondurable) peaks at age 60 at around 30 (35) percent higher than the level of total expenditure for 30 year-old households. Nondurable without housing peaks slightly earlier at 20 percent higher than the level of 30 year olds, does not rise as fast early in life but declines significantly more later in life. The expenditure profiles are almost flat from ages 50 to 65. Compared to the US, in the ECPF-85 the decline in expenditure in old age starts latter in life and is not as dramatic (e.g. see figure 1 in Aguiar and Hurst 2008). When using the ECPF-97, we uncover a pattern more similar to that of the US as nondurable expenditure in old age starts to decline earlier than in the previous period. When focusing on food expenditure, we observe dramatic differences between the two periods. In particular, we observe a lot more variation on food spending at home over the life cycle in the latter period of the survey, but in both periods there seems to be a decline on food expenditure (total and at home) that starts around age 65.

The observed decrease in expenditure at the end of the life cycle in the ECPF does not necessarily constitute a puzzle and it may or may not be associated to retirement. For example, a simple consumption model with uncertainty about the time of death (and an increasing probability of dying as people age) can generate a pattern of expenditure like the one in Figure 1. Also, one has to be careful with sample composition changes. We next analyze if the decline in expenditure later in life is related to retirement.

[6]Nondurable expenditure is defined as the sum of expenditure on food and clothes, utilities, household services, medical services, transportation, entertainment and communications, personal care, restaurants and hotels, housing services–rent for renters and imputed rent for homeowners–and other miscellaneous services.

[7]Alternatively, we could construct the Figure 1 using expenditure per equivalent adult instead of controlling for household size with dummies. While the resulting life-cycle profiles are very similar, this specification is more flexible as it allows for the possible economies of scales to vary by expenditure.

3 Expenditure around Retirement in Spain

3.1 Empirical Specification

We base our empirical tests on the standard Life Cycle-Permanent Income Hypothesis (LCPIH) and the approach folows from a marginal-utility-of-wealth-constant consumption demand function derived from solving the system of first order conditions to a maximization problem where consumers choose consumption and leisure according to the value function (e.g. Browning, Deaton, and Irish 1985, Blundell and Macurdy 1999):

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

subject to budget constraint:

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

where t denotes time, δ is the consumer's discount factor, 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. The first order conditions for the marginal utility of consumption and the marginal utility of wealth, λ_t, are: $U_C(C_t, L_t, X_t) = \lambda_t$ and $\lambda_t = E_t[\lambda_{t+1}(1+r)]$.

The solution to the system of first order conditions results in consumption demand being a function of individual characteristics, and the (constant) marginal utility of wealth so that $C_t = C(\lambda_t, W_t, X_t)$. The marginal utility of wealth captures all expected future information that determines the level of consumption today, including the effect of retirement as long as it is anticipated. Thus, the consumption demand can be estimated as a function of individual characteristics X_{it}, an individual fixed effect α_i (capturing the marginal utility of wealth), and an expectational error term ε_{it}. As in Smith (2006), this function is applied to the retirement-consumption puzzle by estimating:

$$\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}, \tag{1}$$

where $\tilde{R}_{it}$ is a dummy for whether the individual is retired or not.[8] A finding of $\hat{\beta} < 0$ signifies

[8] Wages are not included directly but assumed to be a function of an individual's characteristics and age.

an expenditure drop at retirement, as we are comparing deviations in expenditure from average expenditure associated to retirement for a given household. When estimating (1), we allow for heteroskedasticity of unknown form and cluster standard errors by household.

3.2 Pensions in Spain

The public retirement pension system in Spain is pay-as-you-go, and pensions are of the defined-benefit type. The system is financed through contributions from employers and employees (23.6 and 4.7 percent, respectively).[9] Retirement pensions are organized around three basic plans: the general regime (the largest, covering private sector employees and some public servants), the regime for employees of the Central Government, and five special regimes (the self-employed, miners, fishermen, farm workers and small farm owners, and domestic workers). Individuals may also qualify for a small non-contributive pension at old age if they are not covered by the above plans and can prove need.[10]

The normal retirement age is 65. Certain groups of workers can retire earlier without penalty (typically after age 60 but a few earlier), mostly workers in dangerous professions (miners, fishermen, airline and railroad employees, policemen, etc.), professionals whose activity may be hard to maintain after a certain age (dancers, bullfighters, etc.), and some public employees. Early retirement with penalty is also possible at age 60 for workers in the general regime who contributed to the Social Security system before 1967 (and a few other special cases).

During our sample period, pension eligibility for workers in the general regime requires a minimum of 15 years of contributions and complete withdrawal from the labor force.[11] The initial amount of the pension is obtained by multiplying a base and a replacement rate. (Pensions are updated using the CPI). The base is a moving average of monthly contributions in the 8 years immediately before retirement (15 after a reform in 1997). For those retiring at the normal retirement age, the replacement rate depends on the number of years of contributions. An individual receives 100 percent of the base if he has contributed 35 or more years to the system. Otherwise, the replacement rate is $.6 + .02 \times (n - 15)$, where n is the number of years of contributions. After the 1997 reform, the replacement rate is $.5 + .03 \times (n - 15)$ if $15 \leq n < 25$

[9] Other contributing pensions offered through the Social Security system are pensions for disability, widowhood, orphans and other relatives. Pensions for old-age account for roughly 3/4 of all pensions.

[10] Private pensions plans are not very important for most households during our sample period. Total assets in private pension funds were about 2 percent of GDP in 2001, compared to 75 percent in the US, according to OECD data.

[11] An amendment in 2002 allows for part-time employment after retirement in certain cases.

and $.8 + .02 \times (n - 25)$ if $25 \leq n < 35$.[12]

In case of early retirement, the replacement rate is reduced by 8 percentage points for each year under age 65 (i.e., the penalty is 40 percent for somebody retiring at age 60). After 1997, the penalty is reduced to 7 percent for those who retire early with 40 or more years of contributions.[13] An amendment in 2002 varies the penalty for early retirement from 6 to 8 percent depending on age and the number of years of contributions, introduces a 100 percent replacement rate for those retiring after 65 regardless of contribution years, and provides incentives to work past age 65, as the replacement rate can be higher than 100 percent if retiring after 65 with more than 35 years of contributions. There is a minimum and a maximum for pensions. The minimum pension is compatible with early retirement (and has been increasing over time), which implies no penalty at all from early retirement for certain individuals. Jiménez-Martín and Sanchez-Martín (2007) report that almost 35 percent of old-age pensions were topped up to the minimum in 1999.[14] Also, minimum pensions have been increasing over time and surpassed the minimum annual wage in 2000.

Our sample period corresponds to an era of rapid sectorial change in Spain that led to special agreements between the State and firms in specific sectors (e.g., coal, steel, ship building) to reduce the labor force. Collective wage settlements imposed mandatory retirement at age 65, or facilitated retirement at 64 with full benefits, or encourage early retirement (at 60 or even earlier) through lump sum payments leaving many workers in a pre-retirement situation.[15] According to data from the Spanish Social Security Administration, early retirement is not uncommon in Spain during period covered by our survey. In 1987, 34.4 percent of new retirees where 60 or younger, 27.5 percent where 61–64, 33.6 percent were 65, and 4.5 percent were over 65—the corresponding number for 1999 were 39.5, 23, 33.8 and 3.7, respectively.[16]

Pension replacement rates in Spain are high compared to other OECD countries: the gross

[12]The base and replacement rates are calculated differently for employees of the Central Government. See Boldrin and Jiménez-Martín (2009) for a comprehensive description of the Spanish pension system.

[13]Self-employed workers do not have an early retirement option but can continue to work while receiving a pension. Public employees must retire at age 65, with a few exceptions, can retire early at age 60 without penalty if they have enough years of service, and their pension is compatible with earnings from employment in the private sector.

[14]The level of the minimum pension also varies with household size.

[15]For some workers, this situation is better protection than ordinary dismissal. The state provides unemployment benefits and the firm provides additional contributions to social security and/or above typical severance packages. The process of pre-retirement is quite controversial in Spain as there is a sentiment that many firms which are not in a situation of crisis use pre-retirement agreements as a way to lower labor costs at the expense of public funds. See Miguelez (2000).

[16]See IMSERSO (2002).

replacement rate for the median earner is roughly 81 percent compared to 41 percent in the US or 61 percent on average in the OECD—see OECD (2009).[17] Pensions are not very progressive in Spain, in the sense that replacement rates do not fall much with pre-retirement earnings: the replacement rate is identical for workers with earnings 0.5 to 1.5 times mean earnings, 81 percent, decreasing to 66.7 for those with twice mean earnings. In the same interval, 0.5 to 2 times mean earnings, replacement rates in the US vary from 50.3 to 28.8 percent, and from 72.2 to 50 for the OECD on average.

3.3 Sample

We identify retirement from a question in the ECPF regarding economic activity the week before the interview. In the survey, a household member can be classified in the following categories: (1) employed, (2) unemployed, (3) retired or receiving a pension, (4) homemaker or (5) other—a student, a person in military training, a person living of capital income only, etc. We classify a household head as "retired" if he/she is in category (3).

The survey question does not allow us to distinguish retirement pensions from other pensions. According to Spanish Social Security rules, most individuals are not eligible to receive retirement pensions until age 60. An individual in category (3) who is younger than 60, is either receiving a non-retirement pension (e.g., disability or widowhood), is perhaps in a situation of pre-retirement, or belongs to a very particular group of workers. Figure 2 presents the distribution of retiring ages for the households we observe retiring within the study, who are 50 or older when first interviewed. Although there is a peak in retirements at age 65, a significant proportion of household heads takes advantage of early retirement, and a fraction of heads starts receiving a pension before the legal early retirement age of 60 years old.[18]

For our main analysis, we limit our sample to households with male heads 59 or older who are in the labor force the first time they are observed. This age choice is typical in the literature and allows us to exclude certain individuals who may have retired unexpectedly as normal early retirement starts at 60. We provide robustness analysis regarding the exact sample definition in Appendix A and results are very similar if we include all heads 50 or older to better account for early retirment. We eliminate households with permanent visitors, obvious inconsistencies

[17] Gross replacement rates are measured as pension entitlements from all mandatory sources (public and compulsory private pensions) divided by gross pre-retirement earnings, all before tax.

[18] Unfortunately, the ECPF-85 does not contain information on work hours so we are not able to consider alternative definitions of retirement.

in basic demographic characteristics in consecutive quarters (e.g., a change in head gender or a change in age larger than 2 years), and missing information in any of the necessary variables for our analysis. We use an unbalanced panel in the sense that we include observations from individuals who leave the survey prior to the final year of our sample period. As in previous studies, we only consider the first move into retirement and ignore any subsequent movements in and out of retirement. We also present results for the sub-sample of households who we actually observe retiring.

To be able to compare our results to those of previous studies, we define five broad expenditure categories. C_1 is nondurable spending which includes food and clothes, utilities, household services, medical services, transportation, entertainment and communications, personal care, restaurants and hotels, housing services (rent for renters and imputed rent for homeowners), as well as other miscellaneous services. C_2 is defined as nondurables spending excluding work related expenses (clothes, public transportation, and restaurant meals). We further consider total expenditure, total food expenditure, and food at home.[19]

Table 1 presents summary statistics of the relevant variables for both the ECPF-85 and the ECPF-97. For the ECPF-85, the average age for household heads in our sample is 62. We have 1,472 households, and we observe them 6.7 quarters on average. Of these households, 344, roughly 23 percent (and 27 percent of all the observations), transition into retirement while in the survey. 94 percent of the heads are married and the average household size is 3.4. For the ECPF-97 the numbers are similar, the most important difference being that in the latter survey the number of periods a household is observed is smaller (4.72 on average) reflecting the more recent nature of the survey. There are 1,925 households, of which 394 retire during the period. However, we only observe nondurable expenditure for 40 percent of the observations which correspond to households in a strong collaboration mode.

Figures 3 presents general patterns of spending before and after retirement for the ECPF-85 and the ECPF-97 samples of households who retire over the period. Results seem to suggest a slight decrease in mean spending and income around retirement in the early survey years, the ECPF-85. For the latter years, the ECPF-97, there is no clear declining pattern on nondurable spending. If any, the decline seems to occur two quarters after retirement (Note the ECPF-97 does not have sufficiently detailed information on income to be able to construct these graphs.)

[19]To deal with outliers, we winsorize the logarithm of each expenditure variable by replacing observations above (below) the 99 (1) percentile with that percentile value by year.

When focusing on food expenditure, there is a decline on spending on total food and food at home in both samples, of larger magnitude in the latter years. However, we must resort to regression analysis to reach any conclusions as other factors may account for the depicted drop (e.g, sample composition changes and unobserved heterogeneity).

3.4 Results

Table 2 shows the results obtained when estimating Equation (1) using both the ECPF-85 (and the ECPF-97 together (top two panels) and separately (lower two panels). When using the broader nondurable expenditure definition in the pooled data (C_1), we find a 3.1 percent decline on nondurable expenditure at retirement, which is lower than the estimated drop in household income of 4.1 percent.[20] (Note income is only available for the ECPF-85.) When excluding work related spending, column $C2$, we find no significant drop in expenditure at retirement (the estimated coefficient halves to –1.5 percent and is not precisely estimated). When focusing on food, we fin a drop in total food spending and home food at retirement of 6 percent and 3.8 percent, respectively. We find no significant drop for a measure of total expenditure (the estimated coefficient is –1.9 percent but not significantly differently for zero). When restricting the sample to households who we observe retiring within the survey, the estimated coefficients are quantitatively similar (a bit lower) but less precisely estimated (second panel of Table Table 2) and only the coefficient for total food expenditure is significantly different from zero. Our results are in line with those in Christensen (2008) who uses the ECPF-85 but employs a different sample and methodology. She finds no evidence of a drop of expenditure or income at retirement, except for health related expenses which are heavily subsidized for retirees in Spain.

We repeat the regressions for the two subperiods separately. For the ECPF-85, the coefficients for C_1, total food and income are still negative at around 3 percent but are not precisely estimated. The coefficients for C_2 and food at home are not significantly different from zero. For the ECPF-97, we find a significant drop in total food spending at retirement of roughly 11 percentage points, and of food at home of around 9 percentage points.

Appendix A summarizes results from further analysis. Our findings are robust to changes in the sample definition (considering younger retirees, including female heads, or households

[20]For the ECPF-85, we compute household income as the sum of monetary and non-monetary income for all household members. Monetary income is the sum of salaries and wages, income from self-employment, capital income, pensions, unemployment insurance, and other transfers (including lottery winnings, inheritance,etc.). All monetary income is income after tax withholding and net of Social Security payments. Non-monetary income includes in-kind wages, imputed rent, etc.

retiring from a non-labor force state), and to the inclusion of additional controls for seasonality. We also document similar results when changing the definition of nondurable expenditure to exclude housing services and/or medicines and education.

3.5 Voluntary vs. involuntary retirement

We next explore if there are particular groups of retirees who are not well prepared for retirement. In particular, we investigate whether involuntary retirement is associated with a drop in expenditure in Spain, or whether the Spanish institutional framework, with a high gross pension replacement rate and universal health care, helps households be better prepared for retirement, explaining the little variation in expenditure upon retirement.

Previous studies suggest that the drop in expenditure at retirement may be associated to an unexpected event which decreases wealth (such as a job loss or a negative health shock), and thus the observed drop in expenditure upon retirement is still consistent with a standard life-cycle model. Bernheim, Skinner, and Weinberg (2001) find that households with lower income replacement rates, and a the bottom of the wealth distribution, have larger expenditure drops at retirement. Indeed Tanner (1998) and Marmot, Banks, Blundell, Lessof, and Nazroo (2004) find that ill health and compulsory early redundancy are usually reported as the main reasons for early retirement.

In the theoretical front, Blau (2007) calibrates a standard life-cycle model of retirement showing that uncertainty over the timing of retirement generates a fall in spending if retirement is a non-easily reversible discrete event and caused by an unexpect shock. However, the model falls short of explaining the actual magnitude of the drop found in empirical studies. In the empirical front, researchers have used different strategies to differentiate expected from unexpected retirement. Some studies use Instrumental Variable (IV) analysis. Banks, Blundell, and Tanner (1998) and Bernheim, Skinner, and Weinberg (2001) rely on lagged retirement and age respectively as instruments, finding that the drop in spending is smaller when retirement is anticipated. Haider and Stephens (2007) question the validity of these instruments and try to separate expected from unexpected retirement histories by using a set of questions about subjective expectations on the timing of retirement proven to be powerful predictors of actual retirement histories. With such instrument, they find the expenditure fall at retirement to be about 30 to 40 percent lower than in IV regressions using age as an instrument, but the drop in expenditure does not disappear. A second group of studies uses survey information to

directly classify retirees into voluntary vs. involuntary retirees. Smith (2006) finds that expenditure drops at retirement but only for those individuals who retired unexpectedly following an unemployment or disability spell.

We follow Smith (2006) and asses directly whether retirement is involuntary or not as we lack a good instrument. Since there is a degree of arbitrariness in the process, we define involuntary retirement in different ways. We consider that an individual retires involuntarily when retiring from unemployment, from a non-labor force state or because of a health shock. We consider these events separately. Because we need to observe the household retiring to follow this methodology, results are for the retiring sample only. As in Smith (2006), we interact our retired dummy, $\tilde{R}_{it}$ with and involuntary retirement dummy, I_i, to get at the differential effect of retirement on expenditure for the two groups. That is, we estimate:

$$\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda \left(\tilde{R}_{it} \times I_i \right) + \gamma X_{it} + \varepsilon_{it}. \tag{2}$$

All regressions include year and quarter dummies, household dummies, age and marital status, as well as a health controls (described below).

Table 3 summarizes our findings. Panel (a) shows results when involuntary retirement is due to a health shock. Although the ECPF collects information on household member visits to doctors, this information is not publicly available and we cannot construct direct measures of health or disability status. We rely on expenditure figures on health related goods and services instead. For each year and quarter, we consider that a household experiences a negative health shock if spending in health is above the 80th percentile of health spending for all households in the survey.[21] We consider that a household head retires involuntarily due to poor health, if he suffers a negative health shock in any of the three periods immediately before retirement.[22] (11 percent of our household heads retire due to a health shock according to our definition.)

Interestingly, there is a significant drop of expenditure at retirement for the group who retires involuntarily (from 8 percent for nondurable to 10 percent for food at home). Clearly, this drop in expenditure across the board is not associated to work related expenses, and most likely is due to an unexpected negative wealth shock. However, a health shock can affect the

[21] Although this is far from a perfect measure of health status, the fact that there is universal health care coverage in Spain makes comparisons in health expenditure across households more meaningful than in other countries. Although a non-trivial fraction of households holds private health insurance, for the most serious diseases most households use the National Health System.

[22] Results are robust to using different percentiles and cut off periods.

optimal consumption decision in multiple ways. Health shocks could cause a reallocation of the consumption bundle, all else equal, towards health expenditures away from other consumption categories. If the measure of consumption excludes health expenditures, one may observe declining expenditures in retirement, which is not our case as C_1 and C_2 include health expenditures on health related nondurables and services. Also, health shocks often affect consumption needs. For example, someone stricken with a severe illness that affects their ability to work may also have decreased appetite. Because poor health may also have a direct effect on expenditure, we include an indicator for high health expenditure (in the period) in the regressions as a proxy for health status. Results for the coefficients of interest, β and λ are not affected greatly when this control is not included.

Our findings are very different when involuntary retirement is defined as retiring from unemployment–panel (b). While 24 percent of our households retire from unemployment, household income actually increases at retirement for this group and we observe no differential effect compared to households retiring voluntarily other than for total food expenditure which actually increases for this group. Panel (c) reports results when involuntary retirement is defined as retiring from a non-labor force state (a very small fraction of households belong is this category, about 1.5 percent). In this case, we do observe a significant drop in expenditure at retirement which is concentrated on food spending. Although, it is difficult to discern what type of households are in this group, the results are again consistent with an unexpected negative wealth shock at retirement, which affects mainly non-work related expenses as these households are not in the labor force and have probably adjusted expenditure in such expenses before retirement.

3.6 Summary

Our results suggest that, on average, there is a small expenditure drop at retirement in Spain for nondurables —3 percent compared to the 10 percent drop in food spending in the US (e.g., Haider and Stephens 2007) or the 9 percent drop in nondurable expenditure in Italy (see Brugiavini, Battistin, Rettore, and Weber 2007). However, the expenditure drop at retirement is mainly due to a decrease in work-related expenses (i.e., clothing, transportation, and meals away from home), and a drop in work-related expenses at retirement can hardly be seen as a puzzle. We find no significant drop in total expenditure at retirement, and when restricting our attention to food expenditure, we do find a drop in total food spending and food at home which is driven by the latter years of the survey. We further document that households retiring after receiving

an adverse health shock decrease nondurable and food expenditure significantly, which is also consistent with the LCPIH as health shocks are arguably unexpected events.

Our results regarding nondurable and total food expenditure for the latter part of the sample are consistent with those reported in Aguila, Attanasio, and Meghir (2008), who use the panel structure of the CEX and compare household spending before and after retirement. Unlikely previous studies using U.S. data, these authors find no significant drop in nondurable expenditure at retirement. They also find a drop in total food spending of roughly 6 percent (somewhat smaller than in previous literature), and a decrease in food at home spending around 4.5 percent. Given that food is one of the consumption categories more amenable to home production, the finding that on more comprehensive measures of expenditure the authors fail to find any significant evidence of a drop at retirement provides further support for the Home Production model. We explore this hypothesis next.

4 Consumption vs. Expenditure

Authors such as Aguiar and Hurst (2005) emphasize the distinction between consumption and expenditure to explain the drop in food expenditure upon retirement in the US. They argue that a fall in expenditure is not the same as a fall in consumption. Since retirees have a decreased opportunity cost of time relative to their pre-retired counterparts they can engage in non-market production to reduce their expenditure while keeping actual consumption intake unchanged at retirement. For the home production hypothesis to hold, it is important that retirees engage in additional housework when leaving the labor market, which may not be the case for households with a dedicated homemaker in societies with rigid gender roles. We divide our households in two types according to the presence of a homemaker in the household when the head is first interviewed, and look separately at households with and without a dedicated homemaker. Our homemaker dummy takes the value 1 if the head has a spouse or spouse equivalent in the household who is classified as a"homemaker" if the spouse is younger than 60, or an spouse outside the labor force when older than 60 (i.e, the spouse is a "homemaker", "retired" or "other: outside the labor force"). We use this definition because a spouse is much more likely to say she/he is retired after retirement age or after the spouse retires even if she/he has never worked or has been out of the labor force for several years. The homemaker dummy takes the value 0 for those not married. Ideally, we would like to construct the homemaker dummy by

observing the spouse's head for several years before the head retires, but this is not possible due to the short panel length of the survey.[23] We find that those households retiring within the ECPF-85 without a homemaker do indeed decrease spending on food at home, while households with a homemaker do not. In the ECPF-97, we find no significant differences across household types observing a widespread decrease on total food expenditure and expenditure on food at home—see Table 4.

Differences between the two periods regarding food expenditure across household types may be due to changes in the division of labor within the household that happen as a country develops and female labor participation increases. This is a period of rapid socio-economic change in Spain with a massive emergence of women in public life, in terms of access to education, greater involvement in politics, and participation in the labor market (e.g., Arellano and Bover 1995, Dolado, Felgueroso, and Jimeno 2001, de la Rica 2008, de la Rica 2007). Female labor force participation increased from 34 percent in the mid eighties, to 48 percent in the mid nighties, to 59 percent in 2005 (e.g., de Laat and Sevilla-Sanz 2010). Similarly, whereas in 1992 dual-earners couples represent one third of all households, in 2000 they reach 45 percent—see Franco and Winqvist (2002). Table B-3 in Appendix B documents that the proportion of homemakers in the ECPF-97 is substantially lower than in the ECPF-85 (44 percent vs. 60 percent), while the proportion of households with no homemaker and a head aged 65–75 is slightly higher in the ECPF-97 (10 percent vs. 7 percent). Evidence for other developed countries suggests that increases in female labor force participation are accompanied by higher men's participation in household production activities.[24] For the US, Aguiar and Hurst (2007b) report increases in non-market work by men of almost 4 hours per week between 1975 and 2003. This increase in men's home production time is very similar to the reported increase of three and a half hours per week in market work experienced by women over the same period. Briefly, we argue that whereas in the earlier period of the survey mainly household heads without a dedicated homemaker increase time devoted to home production activities after retirement due to rigid gender roles, households with so-called homemakers become affected by changing gender roles in the latter period, lessening the differences across household types.

Ideally, one would rely on time use evidence to test the above hypothesis. Unfortunately, such

[23] Results are robust to alternative definitions of the homemaker dummy.

[24] Using data from the Multinational Time Use Study, Fernandez, Gimenez-Nadal, and Sevilla-Sanz (2010) show that women double their share of paid work with respect to men from 1980 to 2000 in a group of developed countries, going from 22 percent to 44 percent of total paid work. During the same period, women decrease their share of unpaid work with respect to men from almost 75 percent to nearly 60 percent.

data only exists for the latter period in Spain.[25] The ECPF is unique, however, in that it contains detailed information on quantities purchased on food and drink items. This valuable information enables us to study how paid prices vary over the life cycle and with retirement. Evidence on retirees paying lower prices would suggest a higher shopping intensity and a substitution of market goods for time in home production, in line with the home production model. For the latter period of the survey, we use additional information on the number of meals consumed at home, and complementary time-use evidence from the 2002 Spanish time use Survey (STUS) to further analyze how the trade-off between food at home and food out evolves over the life cycle.

4.1 Explaining the patterns in food at home. Evidence from life-cycle prices

Along with expenditure, the ECPF contains information on purchased quantities for food, drink and tobacco categories (which we refer to as "quantity categories"). This allows us to calculate the unit prices paid by different households and analyze any systematic differences in those prices during the life cycle and by household type. In the data, some of these categories are very narrow while others are not (e.g., fresh whiting fish vs. other fish, or oranges vs. other fruits) so we do not attempt to make comparisons for a given category but for an average price measured described below. In the ECPF-85 there are 32 categories which include quantity and expenditure information, while in the ECPF-97 there 70—details in Appendix A.

We follow Aguiar and Hurst (2007a) who use Nielsen scanner data for groceries to document that households who shop more intensively pay lower prices for identical goods (their data consists of expenditure and quantities, as well as the number of shopping trips for a sample of Denver households from 1993–1995). In their sample, the prices paid by households are fairly constant throughout middle age, but decline sharply afterwards (particularly after age 64). They find that the tendency to shop frequently and the use of discounts can account for about three quarters of the price differences between middle-age and older shoppers. They argue that the large increase in shopping (and home-production) post middle age can account for the decline in expenditure observed in US households, implying a non-decreasing consumption-age profile.

Compared to scanner data, our data has some advantages and disadvantages. First, the

[25] The Basque Country, a northern Spanish region, has been collecting time-diary data every five years since 1993. Authors' cross-tabulations using the interactive data generator feature from the Basque Institute of Statistics at http://www.eustat.es/ show that, between 1993 and 2008 the total time dedicated to housework decreases for individuals younger than sixty (by 25 minutes per day for individuals younger than 35, and by 40 minutes per day for individuals between 35 and 60 years of age), but increases for those over-60 more than half an hour per week. Micro-level data for these surveys are not currently available to researchers.

ECPF-85 does not contain geographical information on the household's residence and is likely that some price differences are location related. If life-cycle migration patterns within the country were such that households migrated towards less expensive areas as they aged, we could be overestimating the effect of age on prices (and *vice versa*). The ECPF-85 does provide information on town size which we control for, and the ECPF-97 contains additional location information (region and town density). Second, unlike scanner data we cannot guarantee that the products in a given category are of identical quality. For example, beer is one of our categories. Within this category we cannot distinguish Heineken from San Miguel or even Heineken 33cL vs. Heineken 1L. Households can substitute goods within a category so if one finds that unit prices decrease with age one has to be careful in interpreting the finding as better shopping by households as they may be simply buying cheaper goods within the category. We address this issue by providing additional time-use information from the STUS and by including income controls in our regressions.[26] One advantage of our data is that expenditure on the quantity categories represents a higher proportion of food at home than in the aforementioned study. In our survey, these items represents 61 (94 percent) percent of total expenditure on food at home, and 18 (31) percent of total expenditure in the ECPF-85 (ECPF-97), while the scanner data categories in Aguiar and Hurst (2007a) represent 20 percent of total grocery expenditure. (See Appendix B for breakdowns by income, age and household composition, as well as a listing of all quantity categories.) Moreover, scanner data does not include meat, fresh foods or vegetables, which we have. An additional advantage comes from the fact that our data covers a longer time span and we have a rotating panel.

Since households buy a variety of different goods, it is not very informative to compare unit prices by category. Instead, we start by computing an average price measure for each households as in Aguiar and Hurst (2007a). First, for each household i and good j in quarter t (of a given year), we compute unit prices, p_{it}^j by dividing real expenditure in the category (deflated using the CPI) by the purchased quantity, q_{it}^j. Let $Q_t^j = \sum_{i \in I} q_{it}^j$ be the total purchased quantity in good j in quarter t. We average over all households in a given quarter to calculate the average price for a given good during that quarter $\overline{p}_t^j$, weighting household unit prices by the quantity

[26] Deaton (1987) introduces a methodology that takes advantage of household-level datasets with expenditure and quantity data to estimate a system of demand equations including estimated own- and cross-price elasticities. He warns that since quality choice is affected by prices, unit values are likely to vary less than proportionately with prices. Also, ratios of expenditures to quantities can have substantial measurement error which would be negatively correlated with quantities. These considerations are important but less so in our case as we are using unit values, which we call prices, on the left hand side and not to calculate elasticities.

purchased by that household relative to the total:

$$\overline{p}_t^j = \sum_{i \in I} p_{it}^j \times \left(\frac{q_{it}^j}{Q_t^j} \right).$$

Next, we combine the individual prices into an index which measures how much more or less than average a household is paying for the basket of goods it purchases, and is calculated as follows:

$$\widetilde{p}_{it} = \frac{\sum_{j \in J} p_{it}^j \times q_{it}^j}{\sum_{j \in J} \bar{p}_t^j \times q_{it}^j}.$$

To guarantee that the index has mean 1 in every period, we divide it by the average price index across households that period:

$$\widehat{p}_{it} = \frac{\widetilde{p}_{it}}{\frac{1}{I} \sum_{i \in I} \widetilde{p}_{it}}.$$

To understand how average prices vary with age, we run regressions of the form:

$$\log \widehat{p}_{it} = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it},$$

where $Age_{i,\lambda}$ is a set of age dummies, and X_{it} a set of household-specific regressors. We correct standard errors for heteroskedasticity of unknown form and cluster them by household. Our sample includes all households ages 25–75. We include 8 age dummies, ages 30–34, 35–39, 40–44, 45–49, 50–55, 55–59, 60–64, and 64–75, the excluded category being households with heads 25–29.

For the ECPF-85 the set of controls includes a density measure for the town where the respondent lives to account for geographical price differences, as well as quarter and year dummies.[27] We find that the average price for households 40–44 is about 1.7 percent lower than that paid by 25–29 year-olds (column (1) of Table 5). Households 50–54 pay 3.1 percent less, households 55–59 pay the least, 3.8 percent less, and those ages 65–75 pay 2.9 percent less than 25–29 year-olds, but slightly more than those 50–64. In column (2), we include the logarithm of household size to control for possible economies of scale in shopping, which in clearly significant (larger households pay less on average). We also include the log of the number of goods purchased to

[27] Price indices are quarter and year specific. Results are very similar if quarter and year dummies are not included in the regressions.

account for changes in the nature of the consumption basket over the life cycle and to roughly account for the effect on prices of substitution across categories; households who purchase more food categories pay less. Households 50–54 pay roughly 2 percent less than the reference group, while those ages 55–75 pay roughly 3.4 percent less (i.e., the differences in prices for those 55–64 and 65–75 disappear). This pattern remains after controlling for household (monetary) income, column (3), and we also find that richer households pay more on average. In column (4), we add a series of controls for household composition. Households with a homemaker pay on average 1.6 percent less, while the presence of young children (defined as those under five) does not seem to make a difference. The interesting pattern is that while households seem to pay less on average as they age, we do not find significant differences between households ages 55–64 and those 65+ (after controlling for household size).[28] This is different from the findings in Aguiar and Hurst (2007a) who report a significant difference between households 65–74 and those 55–64 of roughly 1 percent.

Table 6 reports results using the ECPF-97 (all columns include quarter dummies, year dummies, as well as regional dummies and controls for town density). When we do not include controls for household size, income or household composition, the average price for households 40–44 is about 1 percent lower than that paid by 25–29 year-olds. Households 50–54 pay 1.3 percent less, households 55–59 pay 1.8 percent less, households 60–64 pay 2.6 percent less, and those ages 65–75 pay the least, 3.3 percent less than 25–29 year-olds—column (1). In column (2), we include controls for household size and the number of different goods purchased. We find that larger households pay less, as do households who purchase more items. The age pattern persists with the eldest households paying the least, roughly 4 percent less than 25–29 year-olds.[29] The pattern also remains when we include income dummies, column (3), although the difference between households aged 65–75 and those 55–59 is smaller (3.1 percent lower vs 2.6 percent lower and not statistically significant). In column (4) we add household composition controls and find that households with a dedicated homemaker pay less (0.7 percent less, which is less than half the size of the coefficient when using the ECPF-85) and households with young children pay more on average (about 1.4 percent more). In summary, when using the ECPF-97 our findings are analogous to those of Aguiar and Hurst (2007a) and retired-age households,

[28]The p-values for the test of equality of the dummies for ages 65–75 and ages 55–59 are 0.0004 and 0.63 in columns (1) and (2) or Table 5, respectively.

[29]The p-values for the test of equality of the dummies for ages 65–75 and ages 55–59 are 0.015 and 0.0001 in columns (1) and (2) or Table 6, respectively.

those 65–75, pay roughly 1 percent less for the basket of goods they purchase than households 55–64 (when not controlling for income as Aguiar and Hurst 2007a).

We investigate whether the prices paid during retirement vary by household type. In column (5) of Table 5, we include an interaction of the 65–75 age dummy with a no-homemaker dummy (these are either single heads or married heads with no homemaker), which indicates that for these households there is an additional 0.9 percent decline on average prices at that age (after removing the homemaker effect). We obtain a slightly bigger effect, 1.1 percent, when interacting an age indicator for ages 60–75 and the no-homemaker dummy to account for early retirement in column (6). Although we cannot disentangle the effect of retirement from age with these regressions, we also try an additional specification, column (7), and include a retired dummy and an interaction of the retired and no-homemaker dummies. (We do not interpret the coefficient on the retired dummy as the effect of retirement on prices as it is not possible to separate the effects of age and retirement for households 65+ as they are mostly retired.) The story is the same: retired households with no homemakers seem to pay less on average for the food basket they consume relative to other retired households (after removing the homemaker effect), which is consistent with more home-production in the form of better shopping or buying less prepared foods (which may be cheaper) for this group once they retire and have more time available to shop and cook. However, retired/65+ households with a homemaker still pay overall less than those without one as the coefficient for the homemaker dummy is larger than that of the interaction term. In columns (5)-(7) of Table 6, we repeat the analysis for the ECPF-97. For this subperiod, only the coefficient for the 65+ dummy interacted with the no-homemaker dummy is of comparable magnitude to the one in the ECPF-85, while the estimated coefficients for the other interactions are smaller and no longer significant.

We also exploit the panel dimension of our survey. We pooled data together from both subperiods and use a fixed effects specification to control for unobserved heterogeneity. Results are summarized in Table 7.[30] Column (1) reports that households pay on average .8 percent less after retirement (significant at the 15 percent level). In column (2), we control for town size as savings from increased shopping intensities may not be possible in small towns with limited shopping outlets. In this case, we find that households who live in bigger towns pay 1.6

[30]We do not include year dummies in this specification but always control for household size, number of purchased categories, marital status, age and quarter. Recall our price indices are calculated for a given quarter-year.

percent less after retirement (significant at the 5 percent level).[31] The effect is slightly larger for those who retire in the later survey period, 1.9 percent, column (3). The last two columns split households by homemaker presence before retirement, but we do not find significant differences in these regressions for either period. Overall, it seems there is a significant correlation between retirement and paying lower prices, stronger for the latter sample period, but unfortunately these regressions fall short from confirming the homemaker effect, perhaps due to the smaller sample size.[32]

4.2 Explaining the Food Expenditure Drop in the ECPF-97: Time Use Evidence

Overall, the findings for life-cycle prices are consistent with the different patterns of food spending at home around retirement for the two subperiods of the survey. We find that in the earlier period, most households do not reduce food at home expenditure, nor pay lower prices. Only households without a dedicated homemaker do. In the second period, expenditure and prices drop upon retirement, and there are no significant differences across household types. We argue that these different patterns in life-cycle prices and expenditure can be explained by changes in household roles due to an increase in female outside opportunities possibly leading to more flexible gender roles and support the home production hypothesis as an explanation of the so-called consumption-retirement puzzle.[33] In what follows we present complementary time-use evidence from the 2002 STUS.

The 2002 STUS is the first time-diary survey carried out in Spain, and is part of the Harmonized European Time Use Surveys (HETUS) launched by the EU Statistics Office (EUROSTAT). The survey has a representative sample of 20,603 households and the instrument of the survey is an activities diary for all household members ten or older. Activities are coded according to a harmonized list established by EUROSTAT. Table C-3 in Appendix C reports the average minutes per week that men and women devote to four major activity groups over the life cycle

[31] Small town is defined as having less than 50,000 inhabitants and not a province capital.

[32] The coefficient to the retirement dummy becomes insignificant when including time-fixed effects as there is a clear trend for all households 59+ to pay less than the younger cohort independently of retirement status.

[33] Anecdotal evidence suggests that while grocery shopping by males was certainly not the norm in Spain a few years back, this is more accepted nowadays. Not without a reason the Spanish language includes the term "cocinilla" to refer to a man who deals with domestic issues traditionally seen as women's territory. However, recently it is common to refer to a retiree going shopping as an "agente de bolsa", a play on words as the term translates to "stockbroker" but literally means a "person who carries a bag" (to go shopping). References to this term can be found extensively on the web, in jokes referring to retirees, poems and talks by retirees to other retirees, e.g. http://www.educa.madrid.org/web/ies.principefelipe.madrid/tablon/jubilacion2006.pdf

(personal care, work/study activities, housework, and leisure)——more details in Appendix C. We concentrate our analysis on housework and particularly, grocery shopping and cooking.

Grocery shopping time is distinct from time spent ordering takeout food, or time spent at restaurants. The STUS does not include time spent travelling for grocery shopping separately from other shopping related travel but the alternative of including travel time associated to general shopping does not qualitatively change our conclusions. Cooking includes not only cooking and baking activities, but other cooking-related activities such as setting up the table, washing dishes, and putting dishes in the dishwasher. The amount of time devoted to home production activities increases for men up to age 35, and remains fairly constant until age 65 when it increases again. For women the time spent in housework doubles at age 30, probably coinciding with the arrival of children, and remains constant after that age, decreasing after the age of 65. Women spend about twice as much time on grocery shopping than men, while men's cooking time is roughly one fourth that of women. For both grocery shopping and cooking there seems to be a reallocation of home production time across genders after retirement, which might lead to a more efficient use of time in household production activities (particularly if shopping knowledge can be easily transmitted from the homemaker to the new retiree) and explain the observed expenditure drop in food at retirement. These statistics do not however control for sample heterogeneity, which is important in determining the household time and money allocations. We turn to regression analysis to explore this hypothesis.

Shopping Intensity over the Life Cycle

Table 8 presents results from regressions similar to the life-cycle price regressions, where the dependent variable is minutes of shopping per week. We use a sample of respondents aged 25–75. Columns (1) and (2) report results for men. Shopping time increases over the life cycle, with the largest increase happening after age 60, similar to shopping patterns observed in the US (see Aguiar and Hurst 2007a). In particular, men aged 45–49 spend about 41 additional minutes per week shopping than men younger than 30. This difference increases to 43 minutes for men aged 55–59, and further increases to 52 and 70 minutes for men aged 60–64 and 65–75, respectively. Including additional controls for household size and the presence of young children does not significantly alter the pattern. Men in larger households devote less time to shopping, while those with young children and no dedicated homemaker in the household do more shopping. Given that the average shopping time for men aged 25–29 (the reference group) is of 72 minutes per week, these differences represent an increase of 57 percent for 45–49 year-olds and of 97

percent for those 65+, respectively.

From looking at the male sample only, it seems that households spend more time on grocery shopping as they age, particularly after normal retirement ages. Columns (3) and (4) of Table 8 show similar regressions for the sample of women respondents. There seems to be a substitution between men and women when it comes to shopping, especially after the age of 55. Women increase grocery shopping time until the ages 45–49 (when they spend about 107 more minutes per week shopping than the youngest comparison group). After that age, however, the time women devote to grocery shopping starts to decrease, and more than halves at ages 65–75, when women only spend about 47 minutes per week more on shopping than the comparison group. As in the results for the men sample, controlling for household composition does not alter the life-cycle patterns of shopping time. Women with young children devote less time to shopping as do those who are not homemakers.

Columns (5) and (6) of Table 8 report results from similar regressions for the average shopping time of couples on heads' age for households headed by males, the households we consider in our expenditure regressions.[34] When we combine men and women shopping time, we observe an increase in shopping till ages 50–54, when households spend about 64 more minutes on shopping than the reference group, then shopping time decreases at ages 60–64 when the difference with the reference group narrows to 50 minutes, only to increase again for ages 65–75 to 55 minutes. Even if the age coefficients are only marginally significantly different from each other for ages 60–64 and 65–75, if partners can easily transfer shopping knowledge to the new retirees, and those spend more time shopping, the result can be better overall "shopping outcomes". Thus, the increase in men's shopping time after age 65 may produce a more efficient shopping outcome that overall compensates the decrease in shopping time for women. This is consistent with the observed pattern of lower average prices after retirement age and the lower food at home expenditure upon retirement found for the ECPF-97.

Substituting Food In for Food Out. Evidence from Cooking Time and Meals at Home

Table 9 shows results for cooking time as the dependent variable. Column (2) in Table 9, which controls for household size and composition, shows that for men, cooking time increases

[34] Unlike the American Time Use Survey, the STUS records time diary information for all household members. If the male has no spouse, the shopping time is simply that of the male.

up to age 50, when it dips to pick up again at age 55 and remains relatively unchanged thereafter. Men over the age of 65 spend about 48 more minutes per week on cooking activities than the reference group of men aged 25–29. Given that this reference group spends 121 minutes per week, this difference represents an increase of 40 percent in cooking time for men older than 65 relative to those 25–29.[35] Column (4) in Table 9 shows that women's cooking time trajectory over the life-cycle increases up to age 60 and decreases slightly thereafter. Women over the age of 65 spend 547 more minutes per week on cooking activities than the reference group of women aged 25–29, about 27 percent more than the reference group (who devotes 430 minutes per week to cooking activities). Larger households, households with a dedicated homemaker, and those with young children devote more time to cooking. Interestingly, households over the age of 65 with no dedicated homemaker devote about 39 minutes less to cooking than households of the same age with a dedicated homemaker as individuals may not prepare sophisticated meals when cooking for one. Column (6) shows that the average time that head and spouse spend in cooking activities increases over the entire life-cycle. The age coefficients are however not significantly different from each other beyond age 55, maybe because of early retirement or the fact that eating more at home does not necessarily imply having to devote a lot more time to cooking if retirees prepare simpler meals.

The main point to take away from the results in Table 9 is that, as in the case of shopping, there is a reallocation of the time devoted to cooking between men and women over the life cycle, with women's relative cooking time decreasing at retirement age. This arguably more efficient household division of labor may yield greater savings in the production of home-made meals, inducing households to substitute food out for food in. Further supporting evidence is described in Table 10 which presents the results from running regressions with the logarithm of meals per capita on the left hand side. The ECPF-97 (but not the ECPF-85) collects information on the number of meals household members consume at home (1.9 on average, see Table B-3 for further summary statistics). The number of meals at home per capita increases monotonically with age, which again suggests that households substitute food out for food at home as they age, even after retirement. All in all, this substitution of food away from home for food at home upon retirement is consistent with the drop in total food expenditure at retirement in the second period of the survey we document.

[35] Notice that, unlike the ECPF data, the STUS is a cross-section, and thus the lack of increases in men's cooking time over the life cycle may indeed be capturing a cohort effect.

5 Conclusion

This paper documents that there is no retirement-consumption puzzle in Spain during the period 1985–2004. Although there is a nondurable expenditure drop at retirement, it is relatively small, and can be explained by a decrease in work-related expenses such as clothing, transportation, and restaurant meals. Consistent with other studies, we also document that households who are affected by an unexpected negative shock near retirement, such as an adverse health shock, decrease expenditure at retirement during both periods of the survey.

Interestingly, we document different patterns on food spending upon retirement in the earlier and later years of our survey, as food spending decreases only in the latter years. We argue this finding is consistent with an augmented life-cycle model of consumption and home production once household composition and/or division of labor within the household is taken into account. We should not expect gains from heads' retirement in terms of additional savings from shopping in households with a member specializing in home production, as long as the dedicated homemaker continues to do all housework after the head retires. In other words, if any, one should observe gains from more intensive shopping in households with no dedicated homemakers before the head retires. Consistent with this hypothesis, we find that only households without a homemaker pay lower average prices and reduce spending on food at home at retirement in the earlier years of the ECPF.

In the latter years of the survey, however, we observe that having a household member that identifies himself/herself as a homemaker makes little difference for food expenditure patterns at retirement, finding a widespread drop in food expenditure upon retirement across household types. In terms of changes in paid prices at retirement, we find little differences across household types (with or without homemakers) as they both reduce average prices upon retirement and the differences between the two are either not significant or much smaller than in the previous period. For this latter period, time-use diary evidence indicates that male retirees have higher shopping intensities (measured as time spent shopping) and increase the number of meals and the time devoted to cooking over the life-cycle, especially beyond age 65, which could explain the decrease in food expenditure upon retirement. In fact, households with or without homemakers behave similarly in terms of shopping time use upon retirement. We believe the sharp increase in female labor force participation over our sample period might have brought along changes in household roles that have affected all household types to some extent.

To conclude, it seems that Spanish retirees may not be worse off upon retirement, at least early on into the process. Table C-3 shows that leisure is fairly constant over the life-cycle, increasing slightly upon retirement. Further evidence is presented in Table 11, which summarizes perceptions on financial well-being constructed from a set of unique questions in the ECPF-97. In particular, we construct three indicator variables which measure: (1) if the respondent has difficulty making it to the end of the month in relation to net monthly earnings ($FC1$); (2) if the household has not been able to save anything or make any payments towards a mortgage ($FC2$); (3) If the respondent thinks is not the best moment to make a big purchase (excludes housing, $FC3$). Using our panel of retirees, we run fixed effects regressions to asses the effect of retirement on financial well-being as measured by these indicators. We find no significant differences in the perceptions of retirees and non-retirees, if anything is retirees who feel less financially constrained as measure by $FC1$. We want to end with a word of caution as our panel is fairly short and we capture retirees early into their retirement cycle. Thus, we cannot be sure households savings are adequate to carry them throughout the whole process and further work is necessary to understand the needs and means of the very old in Spain.

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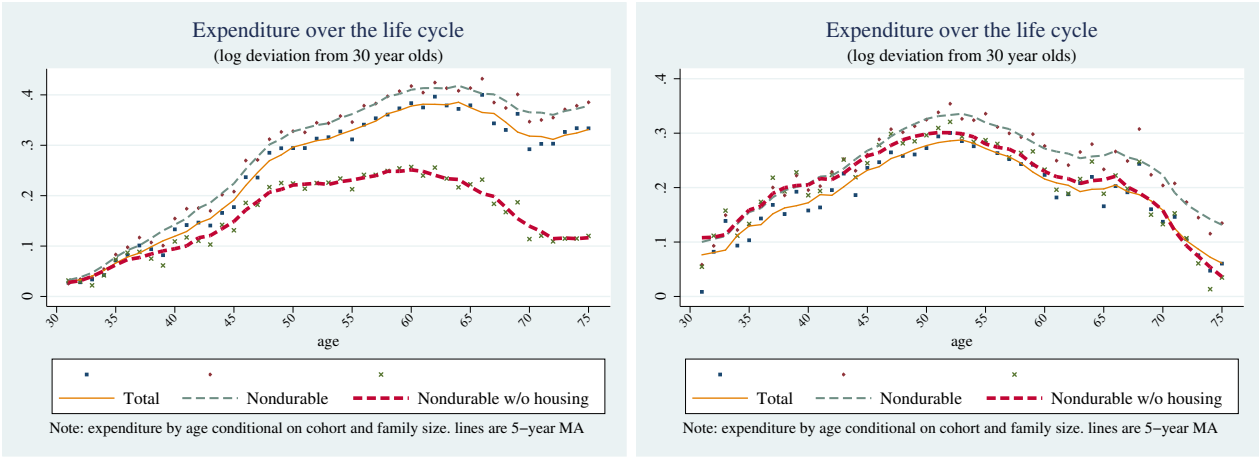
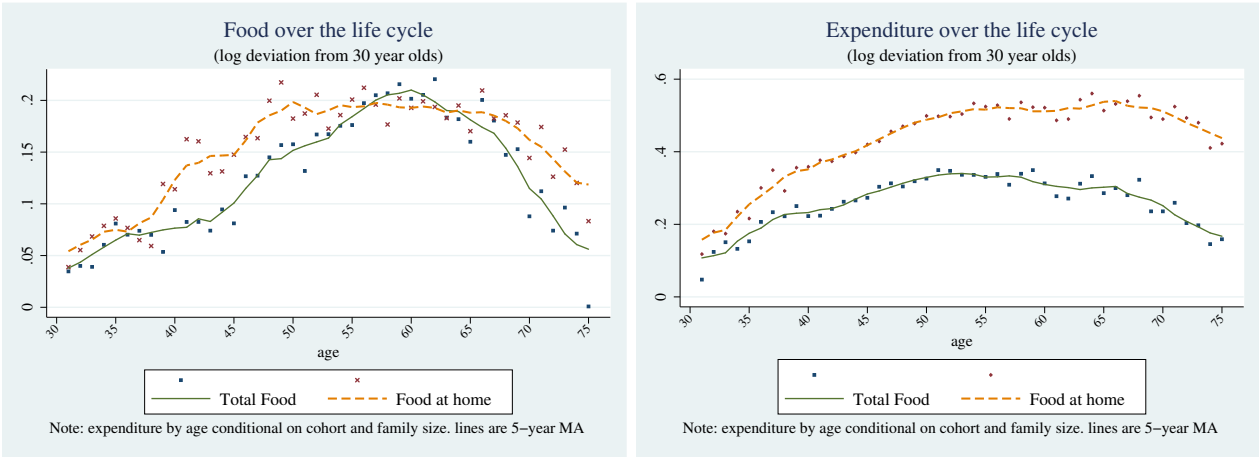
Figure 1: Life-cycle Profiles for Expenditure

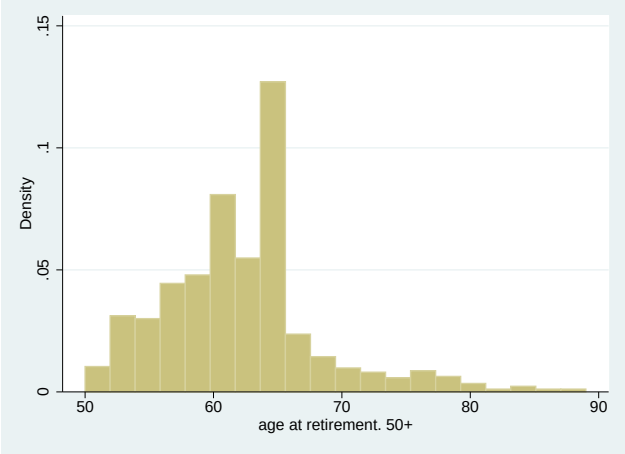


(a) Broad Categories (ECPF-85 left; ECPF-97 right)

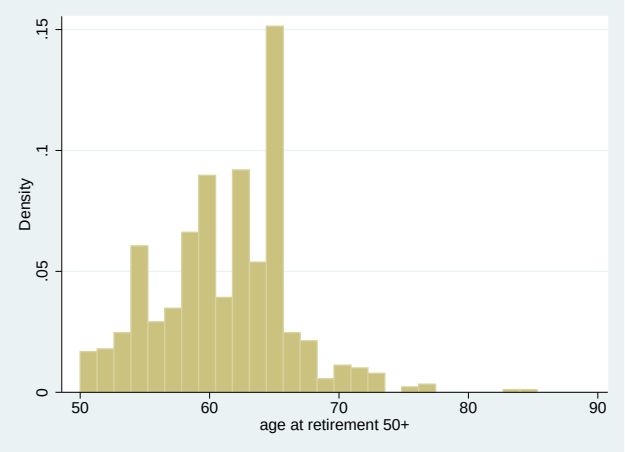


(b) Food (ECPF-85 left; ECPF-97 right)

Figure 2: Distribution of Retirement Ages

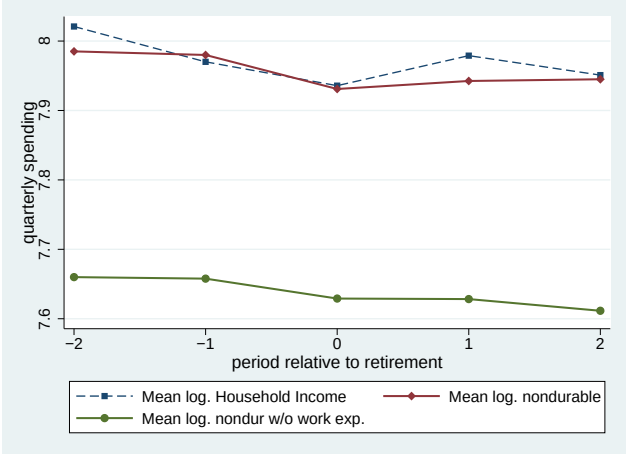


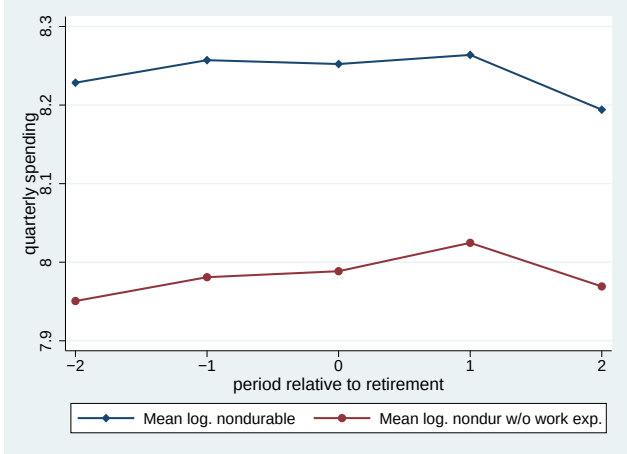
(a) ECPF85



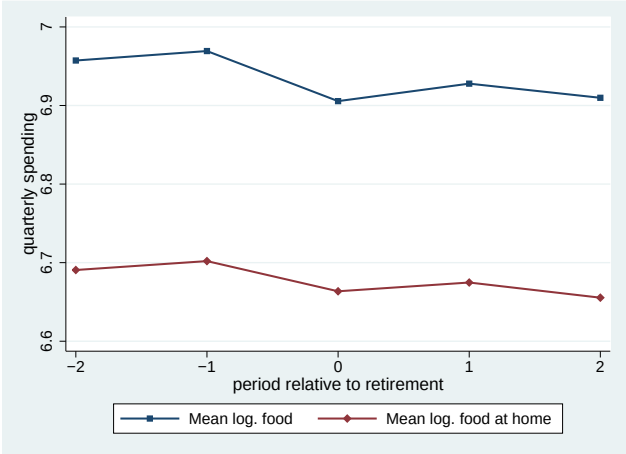
(b) ECPF97

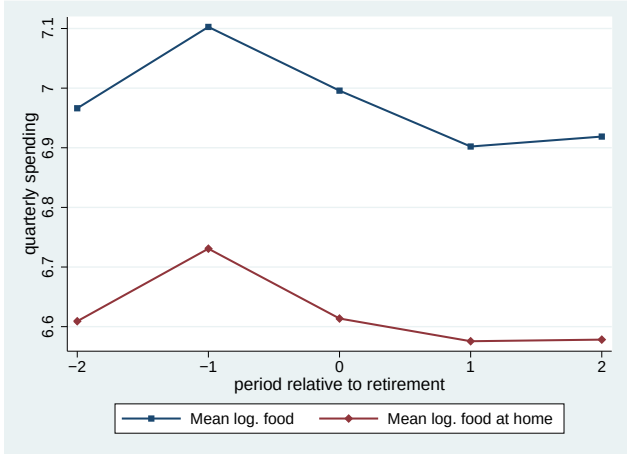
Figure 3: Expenditure around Retirement





(a) Nondurable (ECPF-85 left; ECPF-97 right)





(b) Food (ECPF-85 left; ECPF-97 right)

Table 1: Summary Statistics

	ECFP-85					ECPF-97				
	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N
$\log C_1$	8.01	0.61	6.09	9.34	8516	8.39	0.55	6.70	9.50	4543
$\log C_2$	7.68	0.57	5.87	9.03	8516	8.09	0.52	6.56	9.19	4543
log Food	6.99	0.61	4.80	8.30	8516	7.17	0.65	4.74	8.42	4543
log Food at Home	6.70	0.59	3.45	7.97	8516	6.77	0.70	3.87	8.01	4543
log HH Income	8.04	0.62	6.00	9.43	7914	n.a.	n.a.	n.a	n.a.	n.a.
$\Delta \log C_1$	–0.00	0.37	–2.04	2.17	7044	n.a.	n.a.	n.a	n.a.	n.a.
$\Delta \log C_2$	–0.01	0.37	–2.05	2.05	7044	n.a.	n.a.	n.a	n.a.	n.a.
Δ log Food	–0.00	0.45	–3.07	3.20	7044	n.a.	n.a.	n.a	n.a.	n.a.
Δ log Food at Home	–0.01	0.50	–3.83	3.88	7044	n.a.	n.a.	n.a	n.a.	n.a.
Δ log HH Income	0.01	0.38	–3.12	3.12	6395	n.a.	n.a.	n.a	n.a.	n.a.
HH size	3.35	1.44	1.00	10.00	8516	3.20	1.30	1.00	10.00	4543
Married	0.94	0.23	0.00	1.00	8516	0.92	0.28	0.00	1.00	4543
Head's age	62.13	2.33	58.00	82.00	8516	62.33	3.10	58.00	84.00	4543
Retired dummy	0.13	0.34	0.00	1.00	8516	0.12	0.32	0.00	1.00	4543
Retiring dummy	0.04	0.20	0.00	1.00	8516	0.04	0.20	0.00	1.00	4543
Households	1472					1925				
Household retiring	344					394				
Periods in survey	6.58	1.80	2.00	8.00	8516	4.72	2.64	1.00	8.00	4543

Notes: Our sample includes households with heads 59 or older who were in the labor force when first interviewed. C_1: nondurable and services (includes housing); C_2: C_1 minus work related expenses (clothing, use of vehicle and urban transportation plus food away); Inc. is total household income.

Table 2: Expenditure (Log level) around Retirement.

	Total Expenditure	Nondurables C_1	Nondurables C_2	Total Food	Food at Home	Household Income
			Whole Sample			
Retired dummy	–0.019	–0.031**	–0.015	–0.060***	–0.038**	–0.041**
	(–1.36)	(–2.54)	(–1.18)	(–3.54)	(–2.06)	(–2.07)
F	3.09	3.15	12.83	2.43	2.62	14.54
N	13321	13321	13321	13321	13321	8169
			Retiring Sample			
Retired dummy	–0.003	–0.024	–0.006	–0.052**	–0.028	–0.028
	(–0.15)	(–1.64)	(–0.43)	(–2.38)	(–1.20)	(–1.15)
F	3.96	5.81	3.55	2.39	1.65	4.26
N	3483	3483	3483	3483	3483	2142
			ECPF-85–Retiring Sample			
Retired dummy	–0.004	–0.026	–0.009	–0.028	–0.009	–0.028
	(–0.20)	(–1.49)	(–0.50)	(–1.17)	(–0.34)	(–1.15)
F	21.36	9.88	4.42	4.16	2.41	4.26
N	2303	2303	2303	2303	2303	2142
			ECPF-97–Retiring Sample			
Retired dummy	0.003	–0.016	0.003	–0.115**	–0.087*	
	(0.07)	(–0.69)	(0.13)	(–2.55)	(–1.68)	
F	12.05	5.60	5.66	3.94	1.17	
N	1180	1180	1180	1180	1180	

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed. All regressions include year, quarter dummies and household size dummies, age, age sq. and marital status. Robust standard errors clustered by household.

Table 3: Expenditure (Log level) around Retirement. Involuntary retirement

	Total Expenditure	Nondurables C_1	Nondurables C_2	Total Food	Food at Home	Household Income
			(a) Retiring due to health shocks			
Retired dummy	0.008	–0.009	0.008	–0.034	–0.010	–0.025
	(0.43)	(–0.59)	(0.50)	(–1.48)	(–0.40)	(–0.99)
Retired, Involuntary	–0.055	–0.083**	–0.077**	–0.104**	–0.106**	–0.010
	(–1.54)	(–2.56)	(–2.41)	(–2.45)	(–2.42)	(–0.21)
			(b) Retiring from unemployment			
Retired dummy	0.002	–0.025	–0.007	–0.067***	–0.041	–0.051*
	(0.10)	(–1.56)	(–0.45)	(–2.74)	(–1.64)	(–1.95)
Retired, Involuntary	–0.014	0.008	0.006	0.057*	0.050	0.085**
	(–0.52)	(0.34)	(0.22)	(1.71)	(1.27)	(2.03)
			(c) Retiring from non-labor force state			
Retired dummy	–0.001	–0.022	–0.004	–0.048**	–0.022	–0.029
	(–0.05)	(–1.56)	(–0.26)	(–2.21)	(–0.96)	(–1.20)
Retired, Involuntary	–0.064	–0.061	–0.127**	–0.258**	–0.373***	0.089
	(–0.70)	(–0.76)	(–2.12)	(–2.27)	(–2.99)	(1.10)
N	3483	3483	3483	3483	3483	2142

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda \left(\tilde{R}_{it} \times I_i\right) + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is the retired dummy, I_i is an indicator for involuntary retirement, and X denotes additional controls. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed and we observe retiring. All regressions include year and quarter dummies, household size dummies, age and marital status, and a health status control. Robust standard errors clustered by household.

Table 4: Expenditure (Log level) around Retirement by Household Type

	Total Expenditure	Nondurables C_1	Nondurables C_2	Total Food	Food at Home	Household Income
			(a) ECPF-85			
Retired dummy	–0.008	–0.025	–0.004	–0.017	0.011	–0.027
	(–0.37)	(–1.28)	(–0.21)	(–0.69)	(0.42)	(–1.06)
Retired, No homemaker	0.028	0.001	–0.016	–0.051	–0.094*	–0.004
	(0.70)	(0.03)	(–0.44)	(–1.14)	(–1.72)	(–0.06)
N	2303	2303	2303	2303	2303	2142
			(b) ECPF-97			
Retired dummy	0.009	–0.017	–0.005	–0.120**	–0.098*	
	(0.23)	(–0.69)	(–0.20)	(–2.56)	(–1.86)	
Retired, No homemaker	–0.032	–0.006	0.016	0.017	0.037	
	(–0.71)	(–0.14)	(0.45)	(0.21)	(0.40)	
N	1180	1180	1180	1180	1180	

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda\,(\tilde{R}_{it} \times nH_i) + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy, nH_i is an indicator for a household with no dedicated homemaker when first interviewed, and X denotes additional controls. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed and we observe retiring. All regressions include year and quarter dummies, household size dummies, age and marital status. Robust standard errors clustered by household.

Table 5: Life Cycle Prices-ECPF85

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
30-34	0.005	0.011***	0.010**	0.009**	0.010**	0.010**	0.010**
	(1.31)	(2.65)	(2.38)	(2.31)	(2.35)	(2.39)	(2.43)
35-39	–0.003	0.006	0.007*	0.006	0.007	0.007*	0.008*
	(–0.74)	(1.49)	(1.67)	(1.55)	(1.63)	(1.72)	(1.81)
40-44	–0.017***	–0.005	–0.003	–0.004	–0.003	–0.003	–0.002
	(–4.06)	(–1.25)	(–0.82)	(–0.93)	(–0.81)	(–0.69)	(–0.49)
45-49	–0.024***	–0.012***	–0.011***	–0.012***	–0.011***	–0.011**	–0.009**
	(–5.61)	(–2.80)	(–2.68)	(–2.73)	(–2.60)	(–2.48)	(–2.14)
50-54	–0.032***	–0.023***	–0.024***	–0.024***	–0.023***	–0.023***	–0.019***
	(–7.76)	(–5.41)	(–5.70)	(–5.43)	(–5.29)	(–5.16)	(–4.41)
55-59	–0.039***	–0.034***	–0.032***	–0.031***	–0.031***	–0.030***	–0.025***
	(–9.40)	(–8.06)	(–7.78)	(–7.24)	(–7.12)	(–7.00)	(–5.62)
60-64	–0.036***	–0.035***	–0.033***	–0.030***	–0.030***	–0.026***	–0.019***
	(–8.58)	(–8.36)	(–7.80)	(–6.94)	(–6.83)	(–5.58)	(–4.03)
65-75	–0.029***	–0.034***	–0.032***	–0.028***	–0.025***	–0.024***	–0.009*
	(–7.18)	(–8.54)	(–7.96)	(–6.90)	(–5.63)	(–5.37)	(–1.83)
log hh size		–0.026***	–0.041***	–0.035***	–0.035***	–0.036***	–0.036***
		(–12.66)	(–18.98)	(–15.29)	(–15.35)	(–15.49)	(–15.73)
log no. items		–0.006***	–0.009***	–0.007***	–0.007***	–0.007***	–0.007***
		(–2.70)	(–4.08)	(–3.38)	(–3.38)	(–3.39)	(–3.35)
log. of hh. income			0.024***	0.024***	0.024***	0.023***	0.023***
			(21.81)	(21.47)	(21.43)	(21.42)	(21.63)
young children dummy				–0.001	–0.000	0.000	0.000
				(–0.28)	(–0.13)	(0.02)	(0.13)
Homemaker				–0.015***	–0.016***	–0.018***	–0.018***
				(–8.87)	(–9.04)	(–9.49)	(–9.28)
Age 65-75 × no homemaker					–0.008*		
					(–1.84)		
Age 60-75 × no homemaker						–0.011***	
						(–3.04)	
Retired							–0.017***
							(–5.48)
Retired × no homemaker							–0.008**
							(–2.16)
F	64.6	66.8	85.4	83.3	80.9	81.3	81.8
N	128264	128264	117346	117346	117346	117346	117346

Notes: We run the regression $\log \widehat{p}_{it} = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it}$, where $\widehat{p}_{it}$ is an average price index for household i in period t, $Age_{i,\lambda}$ are a set of age dummies, and X_{it} are a set of household-specific regressors. All regressions include quarter and year dummies, as well as dummies that control for the density of the population where the respondent lives. Sample of households ages 25–75.

Table 6: Life Cycle Prices-ECPF97

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
30-34	0.000	0.004	0.002	–0.000	0.000	–0.000	–0.004
	(0.03)	(0.57)	(0.25)	(–0.02)	(0.01)	(–0.01)	(–0.59)
35-39	–0.003	0.004	0.001	0.001	0.002	0.001	–0.006
	(–0.46)	(0.61)	(0.16)	(0.18)	(0.24)	(0.21)	(–0.69)
40-44	–0.010	–0.002	–0.004	–0.001	–0.000	–0.001	–0.014
	(–1.57)	(–0.26)	(–0.67)	(–0.11)	(–0.03)	(–0.08)	(–1.49)
45-49	–0.009	–0.001	–0.007	–0.001	–0.001	–0.001	–0.019*
	(–1.35)	(–0.09)	(–1.03)	(–0.19)	(–0.09)	(–0.15)	(–1.85)
50-54	–0.013**	–0.006	–0.016**	–0.010	–0.009	–0.009	–0.024**
	(–2.02)	(–0.92)	(–2.47)	(–1.46)	(–1.35)	(–1.41)	(–2.30)
55-59	–0.018***	–0.014**	–0.023***	–0.016**	–0.015**	–0.015**	–0.028**
	(–2.76)	(–2.25)	(–3.57)	(–2.43)	(–2.30)	(–2.37)	(–2.47)
60-64	–0.026***	–0.026***	–0.026***	–0.019***	–0.019***	–0.018**	–0.024**
	(–3.86)	(–4.05)	(–4.12)	(–2.95)	(–2.83)	(–2.57)	(–2.07)
65-75	–0.034***	–0.040***	–0.031***	–0.023***	–0.019***	–0.022***	–0.022*
	(–5.35)	(–6.44)	(–5.01)	(–3.69)	(–2.90)	(–3.30)	(–1.76)
log hh size		–0.031***	–0.059***	–0.058***	–0.059***	–0.058***	–0.058***
		(–13.27)	(–24.08)	(–22.43)	(–22.48)	(–22.38)	(–22.28)
log no. items		–0.194***	–0.188***	–0.189***	–0.189***	–0.189***	–0.189***
		(–35.68)	(–35.91)	(–35.95)	(–35.95)	(–35.95)	(–36.03)
Young children dummy				0.014***	0.014***	0.014***	0.014***
				(4.27)	(4.37)	(4.31)	(4.23)
Homemaker dummy				–0.007***	–0.009***	–0.008***	–0.006***
				(–3.57)	(–4.02)	(–3.33)	(–2.85)
Age 65-75 × no homemaker					–0.008*		
					(–1.80)		
Age 60-75 × no homemaker						–0.002	
						(–0.63)	
Retired dummy							–0.006*
							(–1.79)
Retired × no homemaker							–0.004
							(–1.09)
Income dummies	NO	NO	YES	YES	YES	YES	YES
F	178.3	207.3	238.5	229.0	224.2	224.2	223.6
N	76374	76374	76048	76048	76048	76048	76048

Notes: We run the regression $\log \widehat{p}_{it} = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it}$, where $\widehat{p}_{it}$ is an average price index for household i in period t, $Age_{i,\lambda}$ are a set of age dummies, and X_{it} are a set of household-specific regressors. All regressions include quarter and year dummies, as well as dummies that control for the density of the population where the respondent lives and dummies for the region of residence. Robust standard errors clustered by household. Sample of households ages 25–75.

Table 7: Life-cycle prices around Retirement. Panel estimates.

	(1)	(2)	(3)	(4)	(5)
Retired dummy	–0.008	–0.016**	–0.019**	–0.019**	–0.019**
	(–1.51)	(–2.02)	(–2.09)	(–2.17)	(–2.12)
Retired, small town		0.015	0.014	0.014	0.014
		(1.40)	(1.34)	(1.30)	(1.27)
Retired, earlier period			0.010	0.010	0.010
			(1.05)	(1.08)	(1.01)
Retired, no homemaker				0.003	
				(0.25)	
Retired ECPF-85, no homemaker					0.006
					(0.44)
Retired ECPF-97, no homemaker					–0.002
					(–0.06)
F	1.43	1.44	1.38	1.30	1.24
N	3390	3390	3390	3390	3390

Notes: Regression: $\log \widehat{p}_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda \, (\tilde{R}_{it} \times I_i) + \gamma X_{it} + \varepsilon_{it}$, where $\widehat{p}_{it}$ is an average price index for household i in period t, $\tilde{R}_{it}$ is a retired dummy, I_i are indicator variables indicated in each row, and X denotes additional controls. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed and we observe retiring. All regressions include quarter dummies, household size dummies, age and marital status. Robust standard errors clustered by household.

Table 8: Shopping Time over the Life-cycle Using 2002 STUS

	Men		Women		Average Spouses (male heads)	
	(1)	(2)	(3)	(4)	(5)	(6)
30–34	20.632***	15.448**	42.257***	50.377***	11.659	9.773
	(2.75)	(2.00)	(4.21)	(4.88)	(1.08)	(0.90)
35–39	30.627***	26.205***	53.849***	59.002***	28.358***	23.678**
	(4.11)	(3.39)	(5.48)	(5.91)	(2.77)	(2.27)
40–44	31.569***	31.298***	76.888***	71.465***	42.063***	31.052***
	(4.20)	(4.13)	(7.66)	(7.08)	(4.06)	(2.94)
45–49	40.792***	43.323***	107.323***	97.937***	51.224***	35.819***
	(5.20)	(5.53)	(10.01)	(9.02)	(4.90)	(3.30)
50–54	38.387***	41.005***	104.472***	94.001***	63.541***	47.405***
	(4.81)	(5.14)	(9.84)	(8.74)	(5.87)	(4.24)
55–59	42.933***	43.898***	83.860***	71.535***	55.225***	39.996***
	(5.24)	(5.33)	(8.11)	(6.76)	(5.24)	(3.68)
60–64	52.252***	52.989***	71.550***	54.566***	49.968***	33.842***
	(6.21)	(6.26)	(6.69)	(4.97)	(4.77)	(3.13)
65–75	69.777***	73.061***	46.883***	22.805**	55.038***	40.240***
	(9.42)	(8.87)	(5.20)	(2.34)	(5.63)	(3.78)
Log hh size		–18.040***		0.062		7.472
		(–3.12)		(0.01)		(1.28)
Young children dummy		8.538		–16.030**		–7.630
		(1.39)		(–2.23)		(–1.21)
Housewife Dummy		–15.253***		52.696***		30.598***
		(–3.22)		(9.18)		(6.35)
Age 65-75 x no homemaker		–15.224		–2.784		–10.162
		(–1.24)		(–0.07)		(–0.92)
F	13.371	13.111	65.561	61.380	33.797	32.460
N	15373	15373	17485	17485	13303	13303

Notes: We run the regression $T_i = \alpha + \beta X_t + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_t$, where T_t is weekly minutes spent on shopping for household i, $Age_{i,\lambda}$ are a set of age dummies, and X_i are a set of household-specific regressors. All regressions include day of the week, quarter and year dummies, as well as dummies that control for the region of residence, and dummies for income brackets. Robust standard errors clustered by household. Sample of respondents ages 25–75.

Table 9: Cooking Time over the Life-cycle Using 2002 STUS

	All Men 25–75		All Women 25–75		Average Spouses (male heads)	
	(1)	(2)	(3)	(4)	(5)	(6)
30–34	38.501***	15.478*	176.052***	165.119***	62.884***	38.836**
	(4.45)	(1.81)	(11.50)	(10.30)	(4.15)	(2.53)
35–39	54.624***	36.626***	290.025***	256.105***	121.727***	76.925***
	(6.34)	(4.13)	(19.48)	(16.58)	(8.32)	(5.14)
40–44	53.934***	54.630***	407.596***	372.861***	158.671***	103.305***
	(6.29)	(6.44)	(25.80)	(23.65)	(10.93)	(6.97)
45–49	41.967***	55.453***	451.808***	430.067***	191.602***	132.624***
	(4.88)	(6.57)	(27.64)	(26.18)	(13.01)	(8.72)
50–54	28.227***	41.683***	524.427***	516.912***	205.965***	150.789***
	(3.14)	(4.74)	(30.66)	(30.37)	(13.52)	(9.57)
55–59	44.909***	50.321***	582.753***	596.518***	237.542***	192.589***
	(4.23)	(4.83)	(33.38)	(34.15)	(14.87)	(11.78)
60–64	44.275***	49.631***	555.410***	585.305***	249.105***	207.392***
	(4.09)	(4.67)	(29.62)	(30.89)	(15.51)	(12.56)
65–75	71.172***	48.370***	503.855***	546.660***	242.869***	215.760***
	(7.81)	(5.25)	(33.53)	(33.12)	(16.83)	(14.03)
Log hh size		–84.376***		262.876***		101.710***
		(–11.69)		(23.23)		(11.98)
Young children dummy		29.179***		63.707***		19.433**
		(4.29)		(5.23)		(2.40)
Housewife Dummy		–89.675***		120.015***		71.354***
		(–15.74)		(12.75)		(10.59)
Age 65-75 x no homemaker		114.721***		–154.813**		–39.393**
		(6.16)		(–2.38)		(–2.16)
F	7.639	27.555	91.193	109.088	25.341	39.906
N	15373	15373	17485	17485	13303	13303

Notes: We run the regression $T_i = \alpha + \beta X_t + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_t$, where T_t is weekly hours spent on cooking for household i, $Age_{i,\lambda}$ are a set of age dummies, and X_i are a set of household-specific regressors. All regressions include day of the week, quarter and year dummies, as well as dummies that control for the region of residence, and dummies for income brackets. Robust standard errors clustered by household. Sample of households ages 25–75.

Table 10: Meals at Home-ECPF97

	(1)	(2)	(3)	(4)	(5)
30–34	0.015*	0.011	0.013	0.012	0.011
	(1.66)	(1.19)	(1.48)	(1.32)	(1.30)
35–39	0.044***	0.035***	0.038***	0.037***	0.037***
	(5.09)	(4.15)	(4.43)	(4.37)	(4.34)
40–44	0.071***	0.061***	0.063***	0.064***	0.064***
	(8.43)	(7.25)	(7.59)	(7.59)	(7.54)
45–49	0.079***	0.069***	0.073***	0.073***	0.073***
	(9.43)	(8.17)	(8.78)	(8.63)	(8.56)
50–54	0.085***	0.075***	0.081***	0.079***	0.079***
	(10.03)	(8.90)	(9.78)	(9.32)	(9.24)
55–59	0.104***	0.097***	0.103***	0.098***	0.098***
	(12.38)	(11.62)	(12.41)	(11.59)	(11.50)
60–64	0.124***	0.121***	0.123***	0.116***	0.115***
	(14.46)	(14.25)	(14.57)	(13.44)	(13.35)
65–75	0.144***	0.146***	0.143***	0.134***	0.130***
	(17.36)	(17.86)	(17.60)	(16.01)	(15.38)
log hh size		0.026***	0.039***	0.028***	0.028***
		(8.67)	(12.55)	(8.52)	(8.60)
Young children dummy				0.004	0.004
				(1.13)	(1.05)
Housewife dummy				0.027***	0.029***
				(13.02)	(12.59)
Age 65-75 × no homemaker					0.007
					(1.33)
Income dummies	NO	NO	YES	YES	YES
F	45.4	47.1	52.6	55.4	55.0
N	76374	76374	76048	76048	76048

Notes: We run the regression $\log(1 + \text{meals}_{it}) = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it}$, where meals_{it} is meals at home per person for household i in period t, $Age_{i,\lambda}$ are a set of age dummies, and X_{it} are a set of household-specific regressors. All regressions include quarter and year dummies, as well as dummies that control for the density of the population, regional dummies and dummies for income brackets. Robust standard errors clustered by household. Sample of households ages 25–75.

Table 11: Financial well-being by retirement status, ECPF-97

	(FC1)	(FC2)	(FC3)
	Whole Sample		
Retired	–0.038**	0.002	0.018
	(–2.18)	(0.10)	(0.83)
N	4543	4543	4543
	Retiring		
Retired	–0.028	–0.022	0.033
	(–1.24)	(–0.66)	(1.19)
N	1180	1180	1180

Notes: ($FC1$): In relation to net monthly earnings the respondent finds it difficult to make it to the end of the month; ($FC2$): Taking the net monthly earning as reference, the household has not been able to save anything or make any payments towards a mortgage; ($FC3$): It is not the best moment to make a big purchase (excludes housing). Regression: $FC_{it} = \alpha_i + \beta\tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where FC_{it} is a financial constraint indicator as described above for household i in period t, $\tilde{R}_{it}$ is a retired dummy, and X denotes additional controls. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed. All regressions include year and quarter dummies, household size dummies, age and marital status, and a health status control. Robust standard errors clustered by household.

Appendix A: Robustness Analysis

In this appendix, we perform a battery of robustness analysis to determine if our finding of 'no puzzle' is robust to alternative sample specifications and different definitions of nondurable expenditure.

Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. If we add female heads to the sample, results regarding food expenditure are virtually unchanged, and the effect of retirement on total nondurable expenditure is even smaller. Importantly, all coefficients decrease (in absolute value) when excluding work-related expenses. If we change our cut-off age to include male households 50 or older, our results are qualitatively the same. The estimated drop of consumption at retirement is slightly lower (2.4 versus 3.6 percent) and not significantly different from zero when excluding work-related expenses. The estimated coefficients are practically unchanged when including households who were not in the labor force to begin with (but were not yet retired) in our regressions—see Tables A-1 and A-3.

A separate issue we address is seasonality. The INE collects expenditure data for three different reference periods. Quarterly food expenditure (and a few other items) is computed from expenditures in a reference week multiplied by thirteen. For most nondurables and services (e.g., housing rent), the INE collects monthly expenditures which are multiplied by three. Expenditure on durable goods refers to the whole quarter and are not subject to any transformations. Pou and Alegre (2002) argue that a quarter dummy may not enough to control for seasonality properly and propose including dummies for the week of the interview. Doing this does not affect our results (see row (E) of Tables A-1 and A-3)

Another issue is how income information is recorded. Households are asked to provide information for the quarter before the reference week. This can be problematic when comparing expenditure and income growth rates in a given quarter because most wages and retirement pensions in Spain are paid 14 times a year (12 equal-size monthly paychecks plus two additional checks in July and December, "pagas extraordinarias"). Depending on the week of the interview, some households end up recording the additional paycheck not in the quarter when it was received but the following one. As a result, there can be are artificial differences in the recorded numbers for income and expenditure not related to household real choices—see Pou and Alegre (2002) for a comprehensive description of this issue. This issue is not a problem in our case since we do not regress consumption changes in income changes.

Lastly, we repeat our regressions excluding housing expenditures and/or medicines and education from our measure of nondurable consumption as nondurable expenditure typically excludes these categories in previous literature. Results are reported in Table A-5. When we exclude medicines and education from the definition of nondurable expenditure, the estimated coefficient for the retirement dummy is slightly lower although not statistically different from our previous estimate (at 3.3 percent vs. 3.6 percent for the whole sample). The lower coefficient can be due to the fact that medicines become free for retirees. When we exclude housing services from the definition, the estimated coefficient on retirement is slightly larger, indicating a drop of expenditure at retirement of 4.5 percent (whole sample). Importantly, all coefficients decrease (in absolute value) when excluding work-related expenses regardless of the definition used for nondurable expenditure. We also present results for total expenditure, C_9 and observe no significant drop at retirement in this case.

Alternative Empirical Specification

We also consider an alternative empirical specification that uses growth rates instead of log

consumption deviations with fixed effects that can only be applied to the ECP-85 as it is not possible to compare consecutive growth rates with data from the ECPF-97. This methodology has been extensively used in the literature.

Consider the standard Life Cycle-Permanent Income Hypothesis (LCPIH): Utility is separable intertemporally and households maximize expected discounted utility over the life cycle. Let us assume a constant relative risk aversion utility function:

$$U(C_{it}) = \frac{C_{it}^{1-\sigma}}{1-\sigma} e^{\gamma \theta_{it}},$$

where σ is the risk-aversion coefficient and θ is a taste shifter. Our first specification is based on a log-linearized Euler equation, as in much of the previous literature:

$$\Delta \log C_{it} = \frac{1}{\sigma} \log[\delta(1+r_t)] + \frac{\gamma}{\sigma} \Delta \log \theta_{it} + \epsilon_{it},$$

where r_t is the interest rate between periods t and $t-1$, δ is the discount factor, and ε_t is a rational expectations error. We assume the taste shifter to be a function of age, age squared, family size and marital status.

As in Haider and Stephens (2007), this Euler Equation is applied to the retirement-consumption puzzle by estimating:

$$\Delta \log C_{it} = \alpha + \beta R_{it} + \gamma X_{it} + \varepsilon_{it}, \tag{3}$$

where C_{it} is consumption (deflated appropriately) for household i in quarter t, R_{it} is a dummy variable that takes the value 1 in the quarter of retirement and 0 otherwise, and X is a set of controls which includes quarter dummies (to account for seasonality) year dummies (to capture the gross interest rate), age and age squared of the household head, marital status of the household head and household size dummies. A finding of $\hat{\beta} < 0$ signifies a consumption drop at retirement, which would violate the LCPIH if households are retiring under normal circumstances, but not if they are retiring due to unforeseen reasons of any nature.[36]

The top panel of Table A-6 presents the results from estimating Equation (3) using the ECPF-85. When the broader consumption definition is used, nondurables (column C_1), we find a drop in expenditure in the quarter of retirement of roughly 4 percent, which is lower than the estimated drop if household income of 6.6 percent. When removing work related expenses, the drop in expenditure associated to retirement is 2 percent and is not significantly different from zero (column C_2). Column 'Total Food' shows the regression coefficients when the dependent variable is total food consumption. We find a drop in total food spending at retirement of 5 percentage points. Interestingly, unlike in the US, we do not find a statistically significant drop in food at home expenditure around retirement, although the coefficient is still negative, at around 3 percent (column 'Food at Home'). When restricting the sample to households who we observe retiring, the estimated coefficients are quantitatively very similar but are less precisely estimated (see bottom panel of Table A-6). These results are very similar to those reported in Table 2 (third panel).

[36] We also try specifications which include dummies for one or two periods before and after retirement but these were not significant. The results are also similar if we divide consumption by the number of household members or the number of equivalent adults, and control for changes in household size instead of including household size dummies.

Appendix B: Life Cycle Prices

Quantity Items

Tables B-1 and B-2 summarize the percentage of total food at home (and of total expenditure) that the quantity items represent for different households in the ECPF-85 and the ECPF-97, respectively. We present breakdowns by income, age and household composition. In the ECPF-85, as a percentage of food at home (total expenditure), the quantity categories vary from 57 (15) for households with heads younger than 30 years old to 63 (21) percent for households with heads over 65. The average is 61 percent. The percentage goes down monotonically with income and increases with age. In the ECPF-85, the quantity categories do not include items such as prepared meals. Amongst the excluded categories are also processed items such as cured meats, canned goods, and other categories which represent a smaller proportion of total household expenditure on food at home. We could tentatively interpret the higher expenditure on quantity categories as a signal of more home production in poor and older households. In the ECPF-97, there are 70 quantity categories that include a wider variety of items, including some prepared meals. The patterns across age and income levels are similar to those in the ECPF-85.

Listing of Quantity Categories in the ECPF-85

1. *Wheat bread* (pan de trigo, 1032). It includes all types of wheat bread, including whole wheat.
2. *Beef* (carne de vaca, 1080). It includes all beef meat, fresh and frozen.
3. *Veal* (carne de ternera, 1092). All veal, fresh and frozen.
4. *Pork* (carne de cerdo, 1101). All pork meat including piglet and bacon, fresh and frozen.
5. *Chicken* (pollo y gallina, 1122). All chicken and hen meats, whole or parts, fresh and frozen.
6. *Fresh Hake* (merluza fresca, 1191).
7. *Fresh Whiting* (pescadilla fresca, 1200).
8. *Frozen Hake and Whiting* (merluza y pescadilla congeladas, 1212).
9. *Other Fresh or Frozen Fish* (otros pescados frescos o congelados, 1221).
10. *Cow's Milk* (leche fresca o pasteurizada de vaca, 1260). It includes all fresh and pasteurized cow's milk, whole and skimmed.
11. *U.H.T. Shelf Stable Cow's Milk* (leche esterilizada de vaca, 1272). National and imported, whole and skimmed.
12. *Fresh Eggs* (huevos frescos, 1350).
13. *Olive Oil* (aceite de oliva, 1392).
14. *Sunflower Oil* (aceite de girasol, 1401).
15. *Oranges* (naranjas, 1431).

16. *Other citrus fruits* (otros cítricos, 1440). It includes lemons, mandarin oranges, grapefruits, etc.

17. *Bananas* (plátanos, 1452).

18. *Apples* (manzanas, 1461).

19. *Pears* (peras, 1470).

20. *Other Fresh Fruits* (otras frutas frescas, 1482). It includes peaches, apricots, cherries, plums, strawberries, melon, watermelon, etc.

21. *Cauliflowers and Cabbages* (coliflores y coles, 1512). It includes cauliflower, savoy cabbage, red cabbage, Brussels' sprouts, etc.

22. *Tomatoes* (tomates, 1521).

23. *Green Beans* (judías verdes, 1530).

24. *Other Vegetables and Fresh Legumes* (otras legumbres y hortalizas frescas, 1542). It includes peppers, squash, pumpkin, fresh beans, peas, eggplant, cucumber, onions, green onions, carrots, mushrooms, truffles, beats, turnip, turnip leaf, radish, artichoke, cardon artichoke, chard, spinach, lettuce, endive, watercress, celery, fresh asparagus,leek, parsley, thyme, etc. It does not include potatoes.

25. *Potatoes* (patatas, 1611). Whole and lightly transformed (peeled and cut).

26. *Sugar* (azúcar, 1632). White and brown sugar. It excludes syrups.

27. *Soda water* (gaseosas sin sabor, 1761). Sweetened and unsweeten.

28. *Flavored Sodas* (refrescos con sabor, 1770). It includes coca-cola, fanta, tonic water, non-alcoholic beer, juice based drinks, etc.

29. *Table wine* (vino de mesa, 1791). White, read and rosee. It excludes sparkling wine.

30. *Beer* (cervezas, 1800). It includes all alcoholic beers.

31. *Dark cigarettes* (cigarrillos negros, 1830).

32. *Golden cigarettes* (cigarillos rubios, 1842).

Listing of Quantity Categories in the ECPF-97

1. *Rice* (arroz, 0111102). It includes plain rice of all types and rice prepared rice with meat, fish, seafood or vegetables.

2. *Regular bread* (pan no integral, 0111217). Regular bread of any cereal type. Includes bread crams.

3. *Low calory bread* (pan integral, 0111222). Low calory bread of any cereal type.

4. *Other bakery items* (otros productos de panadería, 0111238).

5. *Pasta* (pasta, 011308). Uncooked fresh or frozen pasta of any kind, including that filled with vegetables, meat or fish.

6. *Beef* (carne de bovino, 0112101). It includes all beef or veal meat, fresh and frozen.

7. *Pork* (carne de cerdo, 0112209. All pork meat including piglet and bacon, fresh and frozen.

8. *Lamb and goat* (carne de ovino and caprino, 0112307). Fresh or frozen.

9. *Chicken* (pollo y gallina, 0112412). All chicken and hen meats, whole or parts, fresh and frozen.

10. *Other poultry* (otras aves frescas, congeladas o refrigeradas, 0112427). Other poultry, fresh and frozen.

11. *Cured meats* (productos de charcutería grasos, 0112519).

12. *Deli meats* (productos de charcutería bajos en grasa, 0112524).

13. *Offal and variety meats* (despojos, menudillos y casquería, 0112524). It includes liver, kidney, heart, tripe, blood, ears, etc.

14. *Prepared meats and prepared products that contain meat* (carnes preparadas y otros productos conteniendo carne, 0112600).

15. *Game and other meats* (Otras carnes comestibles y sus depojos, 0112708). It includes venison, rabbit, horse, camel, etc. Fresh or frozen.

16. *Fresh Hake* (merluza fresca, 0113117).

17. *Fresh Whiting* (pescadilla fresca, 0113122).

18. *Frozen Hake and Whiting* (merluza y pescadilla congeladas, 0113138).

19. *Other Fresh or Frozen Fish* (otros pescados frescos o congelados, 0113143).

20. *Crustacean and mollusk* (crustáceos y moluscos, 0113208). Includes lobster, shrimp, clams, octopus, callamari, etc. Fresh or frozen.

21. *Seafood, smoked or salted* (pescados y mariscos secos, ahumados o salados, 0113306).

22. *Other fish and shellfish, canned or cooked, and seafood based prepared dishes*(otros pescados o mariscos procesados o conservados y preparaciones de pescados y mariscos 0113404).

23. *Cow's whole milk* (leche entera, 0114109). It includes all fresh and pasteurized cow's milk.

24. *Cow's low-fat and non-fat milk* (leche semidescremada y descremada, 0114107). It includes all low-fat or non-fat fresh and pasteurized cow's milk.

25. *Powder milk* (leche en polvo, 0114312). All powder milk products, including baby formula.

26. *Canned or condensed milk* (leche condensada o evaporada, 0114327).

27. *Yogurt* (yogures, 0114403).

28. *Cheese*(Queso y requesón, 0114500).

29. *Eggs* (huevos, 0114706).

30. *Butter* (mantequilla, 0115108).

31. *Margarine and other vegetable spreads, 0115206* (margarina y otras grasas vegetales, 0115206).

32. *Olive Oil* (aceite de oliva, 0115304).

33. *Other vegetable Oils* (otros aceites comestible, 0115402).

34. *Other animal fats* (otras grasas animales, 0115509).

35. *Citrus fruits* (cítricos, 0116107).

36. *Bananas* (plátanos, 0116205).

37. *Apples* (manzanas, 0116303.

38. *Pears* (peras, 0116401).

39. *Other pitted fruits* (frutas con hueso, 0116508). It includes apricots, cherries, mangos, avocado, olives, etc.

40. *Berries* (bayas, 0116606). Fresh or frozen.

41. *Other Fresh or Frozen Fruits* (otras frutas frescas o congeladas, 0116704). It includes, melon, watermelon, kiwi, pineapple, etc.

42. *Seeds and Nuts* (Frutos secos y nueces, 0116802). Seeds and Nuts

43. *Lettuces, Greens and Herbs* (Hortalizas de hoja o tallo y hierbas culinarias, 0117106).

44. *Cauliflowers and Cabbages* (coles, 0117302). It includes cauliflower, savoy cabbage, red cabbage, Brussels' sprouts, etc. Fresh or frozen.

45. *Vegetable grown because of their fruit* (hortalizas cultivadas por su fruto, 0117302). It includes eggplant, squash, corn, beans, etc.

46. *Root vegetables and mushroom* (hortalizas con raíz o bulbo y setas, 0117400). Includes carrots, onions, asparagus,etc.

47. *Legumes* (Legumbres secas, 0117507).

48. *Frozen vegetables* (verduras congeladas, 0117605).

49. *Legumes and vegetables in canned or prepared dishes* (legumbres y hortalizas en conserva, preparadas y otros productos a base de legumbres y hortalizas, 0117703).

50. *Potatoes* (patatas, 0117801). Whole and lightly transformed (peeled and cut).

51. *Other root vegetables* (tubérculos derivados de las patatas, mandioca y otros tubérculos, 0117909).

52. *Sugar* (azúcar, 0118105). White and brown sugar. It excludes syrups.

53. *Jam, marmalade and honey* (confitura, mermelada y miel, 0118203).

54. *Chocolate* (chocolate, 0118301).

55. *Confection* (confitería, 0118409). Includes candy, candied nuts, etc.

56. *Ice-cream* (helado, 0118506).

57. *Other sugar based products* (otros productos a base de azúcar, 0118604).

58. *Sauces and condiments* (Salsas y condimentos, 0119104).

59. *Salt and other spices*(Sal y especias, 0119202).

60. *Prepared powder soups, dessert powder mixes and baking soda* (sopas, preparaciones para postres y levadura, 0119300).

61. *Coffee* (café, 0121107).

62. *Cacao* (cacao, 0121303).

63. *Mineral water* (agua mineral, 0122106).

64. *Sodas* (bebidas gaseosas, 0122204).

65. *Fruit juices* (zumos de frutas, 0122302).

66. *Juices from vegetables* (zumos vegetales, 0122400).

67. *Hard liquor and non-wine base sparkling drinks* (espirituosos y licores, 0211100).

68. *Wine and other fermented fruit drinks* (vinos de uva y de otras frutas fermentadas, 0212109). White, read and rosee wines, apple and pear ciders and from other fruits. Also includes non-alcoholic wines.

69. *Beer* (cervezas, 0213108). It includes all alcoholic beers.

70. *Cigarettes* (cigarrillos, 0221105).

Appendix C: The Spanish time use Survey

The 2002-03 Spanish Time Use Survey (STUS) is part of the Harmonized European Time Use Surveys (HETUS) launched by the EU Statistics Office (EUROSTAT). It consists of a representative sample of 20,603 households and contains information on daily activities by means of the completion of a personal diary and household and individual questionnaires. The sample is evenly distributed over the year and the week in order to accurately represent time use patterns during all days of the week. Unlike the ATUS, which is a recall diary constructed by a telephone interviewer (who asks what the respondent was doing yesterday at 4:00 am, how long the activity lasted, who was there, and where the activity took place, continuing through the day for 24 hours), HETUS surveys are leave-behind written diaries, which are typically of higher quality but are more costly to collect **(e.g. Juster 1985).** The diaries time frame is 24 consecutive hours (from 6:00 a.m in the morning until 6:00 a.m the following day) and is divided into 10 minute intervals. In each of the intervals, the respondent records a main activity and a secondary activity (carried out simultaneously with the primary activity), whether the activity was performed in the company of a child under 10 years old, another member of the household or

another adult, and the location where the activity took place. An extensive literature confirms the reliability and validity of diary data and its superiority over other time use surveys based on stylized questions, asking respondents to estimate time in activities on a "typical day" (e.g., Robinson and Godbey 1985, Juster and Stafford 1991). Activities are coded according to a harmonized list of activities established by Eurostat and are grouped into 10 major categories: personal care, work, studies, household and family, volunteer work and meetings, social life and recreation, sports and open air activities, hobbies and games, means of communication, and non-specified travel and use of time. Table C-2 lists the major categories and subcategories.

Fernandez, Gimenez-Nadal, and Sevilla-Sanz (2010) present a comparison between the STUS and the Spanish Labor Force Survey (EPA), a well-known representative panel data set of the Spanish labor market, and show that the main demographic and economic variables in both data sets resemble each other.

Table C-3 shows the average minutes per week that men and women devote to four major activity groups over the life cycle: personal care activities (including sleeping), work/study activities, household production activities, and leisure activities. The sum of these four activities corresponds to the total of 10,080 minutes available per week. Whereas the time devoted to personal care and leisure activities is roughly the same for men and women and remains fairly constant over the life-cycle by gender, increasing only slightly after the age of 65, the patterns of paid work and unpaid work are very different across genders and also follow very different trajectories over the life-cycle for men and women. Women's time dedicated to unpaid work more than doubles that of men, whereas men devote more than twice the time women do to paid work. Men's time on paid work is stable up to age 50, when it starts to decrease. There is a clear effect of retirement with a significant drop in the time devoted to paid work at age 65. Women start decreasing time devoted to paid labor a bit earlier, at age 45, and a similar drop to that of men's is observed at the age of 65. The amount of time devoted to home production activities increases for men up to age 35, and remains fairly constant until age 65 when it increases again. For women the time spent in housework doubles at age 30, probably coinciding with the arrival of children, and remains constant after that age, decreasing after the age of 65.

Table A-1: Expenditure at Retirement. Robustness I (Whole ECPF85 Sample)

	C_1	C_2	Total Food	Food at Home	Household Income
	(a) Baseline				
Retired dummy	–0.036**	–0.014	–0.045**	–0.027	–0.041**
	(–2.34)	(–0.89)	(–2.39)	(–1.34)	(–2.07)
N	8516	8516	8516	8516	7914
	(b) with female heads				
Retired dummy	–0.021	–0.001	–0.043**	–0.027	–0.042**
	(–1.35)	(–0.03)	(–2.40)	(–1.43)	(–2.21)
N	9298	9298	9298	9298	8611
	(c) age 50+				
Retired dummy	–0.024*	–0.007	–0.036**	–0.020	–0.037**
	(–1.93)	(–0.56)	(–2.45)	(–1.29)	(–2.33)
N	25529	25529	25529	25529	23653
	(d) head not in labor force 1st int.				
Retired dummy	–0.033**	–0.012	–0.040**	–0.025	–0.029
	(–2.16)	(–0.82)	(–2.19)	(–1.27)	(–1.49)
N	8768	8768	8768	8768	8153
	(e) Week dummies				
Retired dummy	–0.035**	–0.013	–0.045**	–0.028	–0.039*
	(–2.30)	(–0.87)	(–2.42)	(–1.36)	(–1.94)
N	8516	8516	8516	8516	7914
	(f) All of the above				
Retired dummy	–0.016	–0.004	–0.031**	–0.020	–0.026*
	(–1.42)	(–0.37)	(–2.47)	(–1.49)	(–1.93)
N	28726	28726	28726	28726	26566

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transpor. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. The baseline specification includes year, quarter dummies, household size dummies, age, age square and marital status of the head of household. Robust standard errors clustered by household.

Table A-2: Expenditure at Retirement. Robustness I (Whole ECPF97 Sample)

	C_1	C_2	Total Food	Food at Home
	(a) Baseline			
Retired dummy	–0.022	–0.018	–0.100***	–0.068*
	(–1.18)	(–1.01)	(–2.74)	(–1.67)
N	4543	4543	4543	4543
	(b) with female heads			
Retired dummy	–0.021	–0.019	–0.082**	–0.066*
	(–1.18)	(–1.12)	(–2.29)	(–1.69)
N	5236	5236	5236	5236
	(c) age 50+			
Retired dummy	–0.017	–0.014	–0.061**	–0.039
	(–1.16)	(–1.02)	(–2.25)	(–1.30)
N	16788	16788	16788	16788
	(d) head not in labor force 1st int.			
Retired dummy	–0.025	–0.013	–0.070**	–0.059*
	(–1.61)	(–0.90)	(–2.56)	(–1.92)
N	26217	26217	26217	26217
	(f) All of the above			
Retired dummy	–0.018*	–0.010	–0.038**	–0.033
	(–1.83)	(–1.02)	(–2.03)	(–1.57)
N	52580	52580	52580	52580

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transpor. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. The baseline specification includes year, quarter dummies, household size dummies, age, age square and marital status of the head of household. Robust standard errors clustered by household.

Table A-3: Expenditure at Retirement. Robustness II (Retiring ECPF85 Sample)

	C_1	C_2	Total Food	Food at Home	Household Income
	(a) Baseline				
Retired dummy	–0.026	–0.009	–0.028	–0.009	–0.028
	(–1.49)	(–0.50)	(–1.17)	(–0.34)	(–1.15)
N	2303	2303	2303	2303	2142
	(b) With female heads				
Retired dummy	–0.009	0.009	–0.029	–0.012	–0.025
	(–0.51)	(0.49)	(–1.31)	(–0.49)	(–1.10)
N	2571	2571	2571	2571	2381
	(c) Age 50+				
Retired dummy	–0.009	0.003	–0.006	0.001	–0.030
	(–0.61)	(0.24)	(–0.33)	(0.05)	(–1.61)
N	3409	3409	3409	3409	3187
	(d) head not in labor force 1st int.				
Retired dummy	–0.020	–0.003	–0.026	–0.004	–0.018
	(–1.19)	(–0.20)	(–1.10)	(–0.15)	(–0.78)
N	2435	2435	2435	2435	2271
	(e) Week dummies				
Retired dummy	–0.025	–0.007	–0.032	–0.011	–0.025
	(–1.41)	(–0.41)	(–1.31)	(–0.43)	(–1.02)
N	2303	2303	2303	2303	2142
	(f) All of the above				
Retired dummy	0.003	0.010	–0.010	–0.004	–0.020
	(0.25)	(0.78)	(–0.66)	(–0.27)	(–1.34)
N	4472	4472	4472	4472	4193

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. The baseline specification includes year, quarter dummies, household size dummies, age, age square and marital status of the head of household.. Robust standard errors clustered by household.

Table A-4: Expenditure at Retirement. Robustness II (Retiring ECPF97 Sample)

	C_1	C_2	Total Food	Food at Home
	(a) Baseline			
Retired dummy	–0.016	0.003	–0.115**	–0.087*
	(–0.69)	(0.13)	(–2.55)	(–1.68)
N	1180	1180	1180	1180
	(b) With female heads			
Retired dummy	–0.019	–0.003	–0.117***	–0.102**
	(–0.83)	(–0.16)	(–2.71)	(–2.04)
N	1309	1309	1309	1309
	(c) Age 50+			
Retired dummy	–0.006	0.004	–0.058	–0.043
	(–0.32)	(0.22)	(–1.60)	(–1.04)
N	1766	1766	1766	1766
	(d) head not in labor force 1st int.			
Retired dummy	0.003	0.015	–0.098**	–0.069
	(0.14)	(0.69)	(–2.58)	(–1.54)
N	1738	1738	1738	1738
	(f) All of the above			
Retired dummy	–0.010	–0.005	–0.051*	–0.048
	(–0.60)	(–0.37)	(–1.78)	(–1.51)
N	3577	3577	3577	3577

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. The baseline specification includes year, quarter dummies, household size dummies, age, age square and marital status of the head of household.. Robust standard errors clustered by household.

Table A-5: Expenditure at Retirement. Robustness Analysis III

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9
Panel A: Whole Sample ECHP-85									
Retired dummy	–0.036**	–0.014	–0.033**	–0.009	–0.045**	–0.022	–0.040**	–0.016	–0.017
	(–2.34)	(–0.89)	(–2.17)	(–0.61)	(–2.49)	(–1.20)	(–2.20)	(–0.86)	(–0.99)
N	8516	8516	8516	8516	8516	8516	8516	8516	8516
Panel B: Retiring Sample ECHP-85									
Retired dummy	–0.026	–0.009	–0.023	–0.002	–0.036*	–0.018	–0.030	–0.008	–0.002
	(–1.49)	(–0.50)	(–1.32)	(–0.10)	(–1.75)	(–0.82)	(–1.44)	(–0.39)	(–0.09)
N	2303	2303	2303	2303	2303	2303	2303	2303	2303
Panel C: Whole Sample ECHP-97									
Retired dummy	–0.022	–0.018	–0.028	–0.027	–0.013	–0.014	–0.023	–0.022	–0.028
	(–1.18)	(–1.01)	(–1.55)	(–1.54)	(–0.49)	(–0.52)	(–1.27)	(–1.20)	(–1.27)
N	4543	4543	4543	4543	4543	4543	4543	4543	4543
Panel D: Retiring Sample ECHP-97									
Retired dummy	–0.016	0.003	–0.022	–0.003	–0.022	0.001	–0.018	–0.001	0.003
	(–0.69)	(0.13)	(–0.98)	(–0.13)	(–0.67)	(0.05)	(–0.77)	(–0.04)	(0.07)
N	1180	1180	1180	1180	1180	1180	1180	1180	1180

Notes: C_1: Nondurable spending including housing services; C_2: C_1 minus work related expenses such as clothing, food away from home, and transport; C_3: C_1 minus education and expenditure in medicines. C_4: C_3 minus work related expenses. C_5: C_1 minus housing services. C_6: C_5 minus work related expenses. C_7: C_1 minus education, expenditure in medicines, and housing services. C_8: C_7 minus work related expenses. C_9 total expenditure. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. α_i is a household fixed effect. Our baseline sample includes households with male heads 59 or older who were in the labor force when first interviewed. The baseline specification includes year, quarter dummies, household size dummies, age, age square and marital status of the head of household. Robust standard errors clustered by household.

Table A-6: Expenditure Change around Retirement. ECPF-85

	C_1	C_2	Total Food	Food at Home	Household Income
			Whole Sample		
Retiring dummy	–0.042**	–0.024	–0.053*	–0.031	–0.066**
	(–2.01)	(–1.16)	(–1.96)	(–0.98)	(–2.26)
F	2.30	2.66	1.47	1.39	5.89
N	7044	7044	7044	7044	6395
			Retiring Sample		
Retiring dummy	–0.039*	–0.018	–0.048	–0.021	–0.068**
	(–1.65)	(–0.76)	(–1.59)	(–0.60)	(–2.14)
F	1.68	2.13	1.21	0.66	2.72
N	1959	1959	1959	1959	1779

Notes: C_1: nondurable and services (includes housing); C_2: C_1 minus work related expenses (clothing, use of vehicle and urban transportation plus food away); Regression: $\Delta \log C_{it} = \alpha + \beta R_{it} + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t. R_{it} is a retired dummy which takes the value 1 in the quarter of retirement and 0 otherwise, and X denotes additional controls. Our sample includes households with male heads 59 or older who were in the labor force when first interviewed. All regressions include year and quarter dummies, as well as 10 household size dummies, age, age sq. and marital status. Robust standard errors clustered by household.

Table B-1: Expenditure on Quantity Items. Percentage of Expenditure. ECPF-85

	Mean	s.d.	p10	p50	p90
Percent of Food Consumption					
All	60.6	16.4	40.1	61.3	80.8
1st Income quintile	63.7	17.8	41.7	64.7	85.6
2nd Income quintile	61.6	16.2	41.2	62.3	81.6
3rd Income quintile	60.4	15.6	40.8	60.9	79.6
4th Income quintile	59.5	15.7	39.7	60.1	78.6
5th Income quintile	58.0	16.1	37.6	58.9	77.5
< 30	56.6	17.8	34.2	57.3	78.2
30-34	57.4	17.1	35.9	58.2	78.0
35-39	58.0	16.1	37.9	58.5	77.4
40-44	59.0	15.3	40.0	59.5	77.6
45-49	59.9	15.3	40.6	60.6	78.7
50-54	60.7	15.3	41.4	61.3	79.5
55-60	62.1	15.6	42.1	62.9	81.2
60-64	62.4	16.0	42.4	63.0	81.9
65-75	63.1	16.7	41.8	63.9	83.9
No homemaker	60.0	17.5	38.1	60.7	81.5
Housewife	60.8	15.1	41.6	61.4	79.6
Percent of Total Consumption					
All	18.4	10.1	7.0	16.9	31.6
1st Income quintile	23.4	11.9	9.4	22.1	39.4
2nd Income quintile	20.4	10.0	8.6	19.3	33.3
3rd Income quintile	18.4	9.1	7.8	17.3	30.2
4th Income quintile	16.5	8.4	6.9	15.4	27.4
5th Income quintile	13.6	7.6	4.8	12.4	23.5
< 30	14.7	9.0	4.4	13.4	26.3
30-34	15.4	8.9	5.3	14.0	27.1
35-39	16.1	8.8	5.8	14.9	27.9
40-44	17.3	8.8	7.1	16.2	28.8
45-49	17.3	8.8	7.1	16.2	28.9
50-54	17.8	9.3	7.3	16.5	29.9
55-60	19.2	9.9	7.9	17.9	32.0
60-64	19.6	10.2	7.9	18.0	33.0
65-75	21.1	11.0	8.5	19.5	35.8
No homemaker	17.3	10.3	5.7	15.6	30.9
Housewife	18.8	9.3	8.1	17.5	31.0

Notes: pX stands for percentile X.

Table B-2: Expenditure on Quantity Items. Percentage of Expenditure. ECPF-97

	Mean	s.d.	p10	p50	p90
Percent of Food Consumption					
All	94.3	7.7	86.2	96.3	100.0
1st Income group	95.5	7.3	88.1	97.7	100.0
2nd Income group	94.5	7.5	86.6	96.4	100.0
3rd Income group	93.9	7.8	85.6	95.8	100.0
4th Income group	93.4	8.2	84.6	95.4	100.0
< 30	92.6	10.4	82.2	95.5	100.0
30-34	92.3	9.5	81.3	94.9	100.0
35-39	92.7	8.7	83.4	94.8	100.0
40-44	93.4	7.7	84.9	95.1	100.0
45-49	93.8	7.4	85.8	95.5	100.0
50-54	94.5	7.0	87.1	96.2	100.0
55-60	95.0	6.9	87.7	96.7	100.0
60-64	95.2	7.5	88.1	97.2	100.0
65-75	95.8	7.0	88.8	97.9	100.0
No homemaker	94.0	8.3	85.4	96.2	100.0
Housewife	94.8	6.9	87.3	96.5	100.0
Percent of Total Consumption					
All	30.8	14.4	12.7	30.0	49.7
1st Income group	35.8	16.0	15.4	35.3	56.7
2nd Income group	32.1	13.8	14.2	31.9	49.9
3rd Income group	29.4	12.7	13.2	29.0	46.0
4th Income group	25.5	12.3	10.0	24.7	41.6
< 30	25.9	14.5	6.5	25.4	44.8
30-34	26.8	13.8	8.9	26.2	45.1
35-39	28.9	14.1	11.2	28.2	47.4
40-44	30.0	13.4	12.8	29.6	47.3
45-49	29.7	13.3	12.8	29.1	47.3
50-54	29.5	13.2	13.0	28.7	46.7
55-60	30.3	13.6	13.2	29.6	48.2
60-64	32.3	14.9	13.9	31.3	51.9
65-75	34.7	15.6	15.0	33.9	55.4
No homemaker	28.9	14.5	10.7	28.0	48.0
Housewife	33.2	13.9	15.8	32.5	51.6

Notes: pX stands for percentile X.

Table B-3: Summary Statistics. Section 4.1

	ECFP-85				ECPF-97			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Meals pc at home					1.88	0.57	0.00	4.00
Unit prices	1.00	0.17	0.01	7.70	1.00	0.23	0.02	28.10
log. unit prices	–0.01	0.16	–4.73	2.04	-0.02	0.19	-3.89	3.34
25–29	0.05	0.21	0.00	1.00	0.02	0.15	0.00	1.00
30–34	0.09	0.29	0.00	1.00	0.07	0.25	0.00	1.00
35–39	0.11	0.31	0.00	1.00	0.10	0.31	0.00	1.00
40–44	0.11	0.31	0.00	1.00	0.12	0.32	0.00	1.00
45–49	0.11	0.31	0.00	1.00	0.12	0.33	0.00	1.00
50–54	0.11	0.32	0.00	1.00	0.12	0.32	0.00	1.00
55–59	0.12	0.32	0.00	1.00	0.11	0.32	0.00	1.00
60–64	0.12	0.32	0.00	1.00	0.10	0.30	0.00	1.00
65–75	0.19	0.39	0.00	1.00	0.23	0.42	0.00	1.00
log. Income	7.73	1.05	–5.96	11.25				
HH size	3.58	1.54	1.00	15.00	3.23	1.35	1.00	19.00
log. hh size	1.17	0.49	0.00	2.71	1.07	0.47	0.00	2.94
No. categories	12.88	4.13	1.00	27.00	65.73	9.13	16.00	70.00
Housewife dummy	0.60	0.49	0.00	1.00	0.44	0.50	0.00	1.00
65–75 $\times$ no homemaker	0.07	0.26	0.00	1.00	0.10	0.29	0.00	1.00
60–75 $\times$ no homemaker	0.11	0.31	0.00	1.00	0.14	0.35	0.00	1.00
Young children	0.20	0.40	0.00	1.00	0.12	0.33	0.00	1.00

Table C-1: 2-TIER LEVEL CLASSIFICATION OF ACTIVITIES IN STUS

ACTIVITIES	CODES
PERSONAL CARE	>= 0 & <= 390
Sleep	>=100 & <200
Food and drink	>=200 & <300
Other personal care	>=300 & <=390
WORK	>=1000 & <=1390
Main job	>=1100 & <1200
Secondary job	>=1200 & <1300
Activities related to work	>=1300 & <=1390
STUDIES	>=2000 a& <=2210
From school to college	>=2100 & <2200
Studies during free time	>=2200 & <=2210
HOUSEHOLD AND FAMILY	>=3000 & <=3910
Cooking activities	>=3100 & <3200
Household maintenance	>=3200 & <3300
Clothes caring	>=3300 & <3400
Gardening and pets	>=3400 & <3500
Construction and repairs	>=3500 & <3600
Shopping and services	>=3600 & <3700
Household management	>=3700 & <3800
Childcare	>=3800 & <3900
Playing with children	= 3830
Basic childcare	(>=3800 & <=3820) or (>=3840 & <3900)
Help to adult members	>=3900 & <=3910
VOLUNTARY WORK AND MEETINGS	>=4000 & <=4390
For an organization	>=4100 & <4200
Informal help to other households	>=4200 & <4300
Participative activities	>=4300 & <=4390
SOCIAL LIFE AND RECREATION	>=5100 & <5200
Recreation and culture	>=5200 & <5300
Pasive leisure	>=5300 & <=5310
SPORTS AND OUTDOOR ACTIVITIES	>=6000 & <=6310
Physical Activity	>=6100 & <6200
Productive Physical Activity	>=6200 & <6300
Activities related to sports	>=6300 & <=6310
HOBBIES AND GAMES	>=7000 & <=7390
Artistic hobbies	>=7100 & <7200
Hobbies	>=7200 & <7300
Games	>=7300 & <=7390
COMUNICATION MEDIA	>=8000 & <=8320
Reading	>=8100 & <8200
TV and video	>=8200 & <8300
Radio and music	>=8300 & <=8320
RIDES AND NO SPECIFIC TIME USE	>=9000 & <=990
Rides with an objective	>=9000 & <9820
Pleasure driving	=9820
Auxiliar codes	>=9900 & <=9990

Notes: Source: 2002 STUS codebook. For expositional purposes we do not include the 3rd tier-level classification of activities.

Table C-2: Summary Statistics from STUS

	Income <500 eur. (1)	Income 500–999 (2)	Income 1000–1499 (3)	Income 1500–1999 (4)	Income 2000–2500 (5)	Income >2500 (6)	Log hh. size (7)	Children 0–6 (%) (8)	Housewife dummy (9)
					Men				
25–29	0.01	0.12	0.24	0.21	0.16	0.26	1.20	0.11	0.47
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
30–34	0.04	0.17	0.29	0.20	0.14	0.16	1.09	0.38	0.55
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
35–39	0.03	0.15	0.29	0.21	0.14	0.17	1.18	0.50	0.53
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
40–44	0.03	0.14	0.27	0.22	0.15	0.19	1.24	0.27	0.45
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
45–49	0.02	0.13	0.24	0.22	0.15	0.24	1.26	0.10	0.37
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50–54	0.03	0.13	0.22	0.19	0.16	0.28	1.23	0.03	0.37
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
55–59	0.05	0.15	0.23	0.18	0.14	0.24	1.11	0.02**	0.38
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
60–64	0.10	0.24	0.24	0.16	0.09	0.16	1.00	0.01	0.31
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
65–75	0.15	0.39	0.24	0.11	0.06	0.06	0.84	0.01**	0.22
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	15373	15373	15373	15373	15373	15373	15373	15373	15373
					Women				
25–29	0.03	0.17	0.24	0.20	0.14	0.22	1.17	0.22	0.47
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
30–34	0.04	0.19	0.30	0.19	0.14	0.15	1.15	0.49	0.53
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
35–39	0.04	0.16	0.28	0.22	0.12	0.17	1.24	0.45	0.49
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
40–44	0.04	0.14	0.25	0.22	0.15	0.20	1.27	0.17	0.38
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
45–49	0.03	0.14	0.24	0.20	0.15	0.25	1.24	0.04	0.35
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50–54	0.05	0.16	0.23	0.18	0.15	0.24	1.18	0.01*	0.33
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
55–59	0.08	0.20	0.25	0.18	0.11	0.19	1.04	0.02**	0.29
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
60–64	0.14	0.30	0.26	0.13	0.07	0.09	0.88	0.01*	0.17
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
65–75	0.24	0.39	0.20	0.10	0.04	0.04	0.70	0.01**	0.02**
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	17485	17485	17485	17485	17485	17485	17485	17485	17485

Notes: Source: 2002 STUS, standard errors in parenthesis.

Table C-3: Time Use over the life cycle: Evidence from 2002 STUS

	Personal Care	Work and Study	Housework	Leisure	Grocery Shopping	Cooking
			Men			
25–29	4589.19	2249.76	434.43	2806.62	72.58	121.36
	(22.35)	(40.30)	(20.00)	(30.40)	(5.56)	(6.64)
30–34	4603.88	2327.61	661.26	2487.25	90.94	160.30
	(24.53)	(44.22)	(21.95)	(33.36)	(6.10)	(7.29)
35–39	4593.54	2249.11	812.89	2424.46	103.19	176.80
	(22.77)	(41.05)	(20.37)	(30.97)	(5.66)	(6.77)
40–44	4541.47	2290.53	747.53	2500.46	103.62	176.22
	(22.56)	(40.68)	(20.19)	(30.69)	(5.61)	(6.71)
45–49	4626.32	2161.35	716.77	2575.56	113.33	162.51
	(23.31)	(42.02)	(20.86)	(31.70)	(5.80)	(6.93)
50–54	4704.20	2037.47	604.59	2733.73	108.75	149.73
	(24.71)	(44.55)	(22.11)	(33.61)	(6.14)	(7.35)
55–59	4779.47	1704.06	704.73	2891.73	113.40	168.64
	(25.42)	(45.83)	(22.74)	(34.57)	(6.32)	(7.56)
60–64	4957.32	1115.56	786.46	3220.66	121.04	172.67
	(28.69)	(51.73)	(25.67)	(39.02)	(7.13)	(8.53)
65–75	5309.42	123.34	946.43	3700.81	133.07	201.01
	(18.96)	(34.19)	(16.97)	(25.79)	(4.72)	(5.64)
N	15373	15373	15373	15373	15373	15373
			Women			
25–29	4645.69	1739.87	1297.25	2397.20	155.73	429.53
	(20.05)	(31.08)	(28.53)	(25.19)	(7.24)	(12.32)
30–34	4601.00	1193.05	2116.79	2169.17	193.36	616.37
	(20.30)	(31.47)	(28.88)	(25.51)	(7.33)	(12.47)
35–39	4517.71	1127.01	2324.14	2111.14	211.87	729.04
	(18.91)	(29.32)	(26.91)	(23.76)	(6.83)	(11.62)
40–44	4540.24	1131.83	2283.65	2124.27	227.94	836.43
	(19.10)	(29.62)	(27.19)	(24.01)	(6.90)	(11.74)
45–49	4575.50	1018.20	2233.51	2252.79	256.25	871.16
	(20.09)	(31.15)	(28.59)	(25.25)	(7.26)	(12.35)
50–54	4604.28	815.92	2352.64	2307.16	255.47	943.03
	(20.69)	(32.09)	(29.45)	(26.01)	(7.47)	(12.72)
55–59	4680.77	554.44	2430.43	2414.36	235.78	1011.87
	(21.35)	(33.11)	(30.39)	(26.84)	(7.71)	(13.12)
60–64	4845.52	326.64	2417.49	2490.35	221.35	1010.10
	(23.17)	(35.92)	(32.97)	(29.12)	(8.37)	(14.24)
65–75	5036.29	49.58*	2273.33	2720.80	196.08	966.21
	(14.79)	(22.93)	(21.05)	(18.59)	(5.34)	(9.09)
N	17485	17485	17485	17485	17485	17485

Notes: Authors calculation from 2002 STUS, measured in minutes per week.