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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 period. Our findings are consistent with a household model that allows for home production whereby retirees substitute away from market goods to home production, as long as one accounts for the greater participation in housework by men after retirement coinciding with the latter period of the survey.

JEL Classification: E21

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1 Introduction

We use a rich and unique longitudinal expenditure survey from Spain to study if the substitution between market goods and home-produced goods within households can explain expenditure patterns around retirement. Households appear to reduce expenditure substantially around the age of retirement, which is documented for the US (e.g., Hamermesh 1984, Mariger 1987, Bernheim, Skinner, and Weinberg 2001, Haider and Stephens 2007), 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, Battistin, Brugiavini, Rettore, and Weber 2009), 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 is 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, from myopic or nonrational behavior as argued by Bernheim, Skinner, and Weinberg (2001) and Angeletos, Laibson, Repetto, Tobacman, and Weinberg (2001), to the arrival of unexpected shocks as in Smith (2006) or to the non-separabilities between leisure and consumption as in Banks, Blundell, and Tanner (1998). Hurst (2008) reviews the literature and reveals that most of the studies reporting a consumption drop at retirement focus on food, and that nondurable spending does not vary much at retirement. The fact that food is an expenditure category very amenable to home production has led some researchers to argue that conventional economic theory, properly augmented with home production, can provide an explanation for the drop in expenditure around retirement. Hurd and Rohwedder (2005) 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 later in life, both consistent with a home production story.

Due to the lack of suitable longitudinal data with detailed information on expenditure, much

of the previous literature has focused on food expenditure (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 contribute to the literature by using a very rich longitudinal study, the Spanish expenditure survey, a rotating panel that follows households for up to eight quarters. Given the longitudinal nature of the data, we 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 changes its methodology in 1997 and we report results from the earlier years (1985–1997) and the later years (1998–2004) separately in some cases.

Nondurable expenditure inclusive of work-related categories decreases slightly at retirement in Spain but there is no such drop for an expenditure measure which excludes work-related 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. When focusing on food, we find a decrease in food expenditure (total and at home) in the later years of the survey only—a drop of roughly 11 percentage points for total food spending, and of 9 percentage points for food at home.

The significant decrease in total food spending at retirement in the later years of the survey is consistent with a home-production model whereby the drop in food expenditure is mainly driven by a decrease in the cost of the food basket for retirees. Using unique information on purchased quantities of food, drink and tobacco categories available in the expenditure survey, we construct household-specific price indices following Aguiar and Hurst (2007a). As in the US, older households pay less for the basket of goods they purchase, especially after retirement ages. With information on the number of meals consumed at home for this latter period from the survey and additional time-use information from a dataset that matches the latter period, we document that households eat more meals at home upon retirement and increase the time they spend on shopping and cooking at retirement ages (due mostly to increases in men's home production time).

As with spending on food at home, there are no significant changes in paid prices at retirement in the first period of the survey. Our conjecture is that the difference in the behavior of food spending and paid prices around retirement in both periods is related to an increase

in men's participation in home-production activities in the latter period, which coincides with a significant increase in female labor participation. Our findings are consistent with a model where traditional norms regarding the household division of labor prevent the reallocation of home-production time between the spouses that would otherwise result from a change in relative wages upon retirement—i.e., food expenditure before and after retirement stays the same because home-production time and allocation stays the same. Consistent with this model, more egalitarian households retiring within the first period do indeed decrease spending on food at home, while more traditional households who follow the gender division of labor prescribed by the social norm do not change expenditure with retirement. In the latter period, there is a widespread decrease in food expenditure across all household types, which is consistent with a model with more egalitarian social norms that allow spouses to reallocate time upon retirement, resulting in the substitution of market goods for home-produced goods and the drop in food expenditure upon retirement, albeit not necessarily consumption, observed in the later years.

The rest of the paper is organized as follows. Section 2 briefly describes the dataset and provides a brief summary on the Spanish pension system. Section 3 documents how spending changes upon retirement in Spain. Section 4 investigates the home-production model. Section 5 concludes.

2 Data and Background on Spanish pensions

2.1 The Spanish Expenditure Survey

We use a household-level dataset 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 households for up to eight consecutive quarters. The ECPF overcomes some shortcomings of other panel datasets such as the PSID or the BHPS because it contains very detailed and comprehensive information on expenditure (not just food) as well as demographic and economic variables. Since households are followed for a longer period than households in the Consumer Expenditure Survey (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 dataset is the availability of information on quantities purchased for a broad range of food items (in addition to expenditure), 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).[1] 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 later 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.[2] With this change, the INE wanted to limit 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.[3] 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

[1] 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.

[2] 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 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 those items using the form as well as recall information.

[3] 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.)

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.[4] Growth rates in the ECFP-85 and the National Accounts are practically the same for both income and total expenditure, which suggests that underreporting is constant over the period. The ECPF-97 accounts for roughly 85 percent of consumption in the National Accounts but income information is very limited in the ECPF-97 to perform comparisons.[5] Appendix 5 depicts expenditure life-cycle profiles for both the ECPF-85 and ECPF-97 which already reveal some differences on the behavior of food expenditure in both periods, with a lot more variation on food spending over the life-cycle in the latter period.

2.2 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).[6] 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 qualify for a small non-contributive pension at old age if they are not covered by the above plans and can prove need.[7]

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, or at age 61 for the unemployed who have contributed for at least 30 years to the system (and a few other special cases).

During our sample period, pension eligibility for workers in the general regime requires a

[4] Earnings are better captured than capital income, accounting for 69 percent and 15 percent, respectively, of the corresponding figures in the National Accounts.

[5] Authors calculations available upon request.

[6] 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.

[7] 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.

minimum of 15 years of contributions and complete withdrawal from the labor force.[8] 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.[9]

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. 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.[10] 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.[11] 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.[12] According

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

[9] 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 $15 \leq n < 25$ and $.8 + .02 \times (n - 25)$ if $25 \leq n < 35$. 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.

[10] 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.

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

[12] 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).

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 are 60 or younger, 27.5 percent are 61–64, 33.6 percent are 65, and 4.5 percent are over 65—the corresponding numbers for 1999 were 39.5, 23, 33.8 and 3.7, respectively.[13]

Gross pension replacement rates in Spain are high compared to other OECD countries: the gross 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).[14] 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.[15]

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 follows 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

[13] See IMSERSO (2002).

[14] 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.

[15] Net replacement rates, replacement rates as a percentage of net earnings, are slightly higher, 84.2 percent for the median earner.

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, 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.[16] A finding of $\hat{\beta} < 0$ signifies 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.[17]

3.2 Sample

Retirement is identified 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 focus on heads and 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 1 presents the distri-

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

[17] Appendix B presents results from an alternative specification that relies on expenditure growth rates calculated using the ECPF-85. Results are very similar in the two specifications.

bution 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 take advantage of early retirement, and a fraction of heads starts receiving a pension before the legal early retirement age of 60.[18]

For the main analysis, the sample is limited to households with male heads 59 or older who are in the labor force the first time they are observed. This age choice allows us to exclude certain individuals who may have retired unexpectedly as normal early retirement starts at 60. Robustness analysis regarding the exact sample definition in Appendix A shows that results are very similar when including all heads 50 or older. Households with permanent visitors are excluded, as are households with obvious inconsistencies 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. The panel is unbalanced in the sense that observations from individuals who leave the survey prior to the final year of our sample period are included. 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). The other measures are 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 members. For the ECPF-97 the numbers are similar, the most important difference being that the number

[18]The ECPF-85 does not contain information on work hours so we are not able to consider alternative definitions of retirement. The ECPF-97 has information on work hours, but only for those reporting to be employed.

[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.

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, nondurable expenditure observations are only comparable for 40 percent of the observations, corresponding to households in strong collaboration mode.

Figure 2 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. There is a slight decrease in mean spending and income around retirement in the early survey years, the ECPF-85. In the later years, there is no clear declining pattern on nondurable spending. If any, the decline seems to occur two quarters after retirement. (The ECPF-97 does not have sufficiently detailed information on income to construct the income graph.) When focusing on food expenditure, there is a decline in spending on total food and food at home in both samples, of larger magnitude for the later 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).

3.3 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] (Income is only available for the ECPF-85.) When excluding work related spending, column C_2, there is no significant drop in expenditure at retirement (the estimated coefficient halves to –1.5 percent and is not precisely estimated). For food, there is a decrease in total food spending and home food at retirement of 6 and 3.8 percent, respectively. There is no significant drop in total expenditure (the estimated coefficient is –1.9 percent but not significantly differently from 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 2) and only the coefficient for total food expenditure is significantly different from zero. Our results are in line with those in Christensen

[20]For the ECPF-85, household income is 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.

(2008) who uses the ECPF-85 but employs a different sample and methodology. She finds no evidence of a drop in expenditure at retirement, except for health related expenses which are heavily subsidized for retirees in Spain.

The lower panels of Table 2 report 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 only in food spending at retirement, total and at home, of roughly 11 percent and 9 percent, respectively.

Appendix B summarizes results from further analysis and describes that results are robust to changes in the sample definition (considering younger retirees, including female heads, or households 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. Bernheim, Skinner, and Weinberg (2001) find that households with lower income replacement rates, and at the bottom of the wealth distribution, have larger expenditure drops at retirement. Income replacement rates do no vary greatly in Spain and the ECPF does not collect wealth data but our findings are not driven by the income-poor as discussed in Appendix B, Table B-6.

Previous studies suggest that the drop in expenditure at retirement may be associated to an unexpected event which decreases wealth (such as 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.[21] We asses whether expenditure patterns depend on retirement being voluntary or involuntary as in Smith (2006). Since there is a degree of arbitrariness in classifying retirement as unexpected, we define involuntary retirement in different ways: a head of household retiring from unemployment, from a non-labor force state or because of a health shock (considering these events separately). Results are for the retiring sample only because we need to observe the household retiring to follow this methodology. As in Smith (2006), we interact our retired dummy, $\tilde{R}_{it}$ with an involuntary retirement dummy, I_i, to get at the differential effect of retirement on expenditure for the two groups.[22] That is, we estimate:

[21] In the theoretical front, Blau (2008) 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 is caused by an unexpect shock. However, the model falls short of explaining the actual magnitude of the drop found in empirical studies. 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.

[22] We follow this methodology because we lack a good instrument. Previous studies use Instrumental Variable (IV) analysis that relies on lagged retirement and age respectively as instruments (e.g., Banks, Blundell, and

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

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.[23] 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.[24] (11 percent of our household heads retire due to a health shock according to our definition.)

Interestingly, there is a significant drop in 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 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 at 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 the 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

Tanner 1998, Bernheim, Skinner, and Weinberg 2001). 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.

[23] 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.

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

control is not included.

Our findings are 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.

The drop in food expenditure in the ECPF-97 cannot be fully explained by involuntary retirement though, as shown in Panel (d). In fact, our results for the ECPF-97 are consistent with those reported in Aguila, Attanasio, and Meghir (2008), who use the panel structure of the CEX for the first time and compare household spending before and after retirement. Unlike previous studies using U.S. cross-sectional 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 of around 4.5 percent. Given that food is one of the consumption categories more amenable to home production, they argue their evidence provides further support for the home-production explanation of the puzzle. Next section investigates whether the home-production model can explain the drop in food expenditure at retirement in Spain in the latter period of the survey and the different patterns of food expenditure upon retirement in the two periods.

4 Consumption vs. Expenditure: Evidence from life-cycle prices

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. 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. Aguiar and Hurst (2007a) 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). 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, and argue that the large increase in shopping (and home production) post middle age can account for the decline in expenditure observed for US households despite a non-decreasing consumption-age profile.

The ECPF is unique in that along with expenditure, it contains information on purchased quantities for food, drink and tobacco categories (which we refer to as "quantity categories"). Using this quantity information, we calculate the average prices paid by different households and analyze any systematic differences in those prices during the life cycle. Some of the quantity 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 measure described below. In the ECPF-85 there are 32 categories which include quantity and expenditure information, while in the ECPF-97 there are 70—details in Appendix C. For the latter period of the survey, there is additional information on the number of meals consumed at home to explore how the trade-off between food at home and food out evolves over the life cycle, and we obtain complementary time-use evidence from the 2002 Spanish time-use Survey (STUS) to determine if there are changes in household specialization after retirement.

Compared to scanner data, our data have some advantages and disadvantages. One advantage is that expenditure on the quantity categories represents a higher proportion of food at home in our data than in the aforementioned study. In our survey, these items represents 61 (94) percent of food-at-home expenditure, and 18 (31) percent of total expenditure in the ECPF-85 (ECPF-97), while scanner data categories in Aguiar and Hurst (2007a) represent just 20 percent of total grocery expenditure. (See Appendix C 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. However, the 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*). In order to minimize this bias we include

town density measures in our estimates.[25] 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. Finding that prices decrease with age could result from buying cheaper goods within the category (as households can substitute goods within a category) and not necessarily from a higher shopping intensity. We address this issue by including income controls in our price regressions and by providing complementary evidence on time-use patterns.[26]

Since households buy a variety of different goods, it is not very informative to compare unit prices by category. Instead, we compute 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 of good j in quarter t. Averaging over all households, we calculate the average price for a given good during that period $\overline{p}_t^j$, weighting household unit prices by the relative quantity purchased by that household:

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

Individual prices are combined 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

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

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

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

[25] The ECPF-97 contains additional region information that we use.

[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 unit values, which we call prices, are on the left hand side and are not used to calculate elasticities.

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 aged 25–75. We include eight 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.

Table 4 reports results for the ECPF-85 and the ECPF-97. All columns include quarter dummies, year dummies, as well as controls for town density to account for geographical price differences. Results using the ECPF-97 also include regional dummies.[27] For the ECPF-85, Panel A shows that the average price paid by households aged 40–44 is about 1.7 percent lower than that paid by 25–29 year-olds (column (1) of Table 4). 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. Panel B shows results for the latter period. The average price paid by 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). Column (2) in both panels includes the logarithm of household size to control for possible economies of scale in shopping, which is clearly significant in both periods (larger households pay less on average).[28] We also include the logarithm of the number of goods purchased to control 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. After adding these controls, the differences in paid prices between those aged 55–59 and those 65+ disappear for the ECPF-85 but widen for the ECPF-97. The pattern also remains when we include income controls—household (monetary) income in the ECPF-85 and income dummies in the ECPF-97—and we find that richer households pay more on average, column (3).

The findings for life-cycle prices are thus consistent with the different patterns of food spend-

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

[28] The results in this Section are robust to inclusion of children dummies in the regression.

ing at home around retirement for the two subperiods of the survey: In the earlier period households do not reduce food at home expenditure or pay lower prices. In the second period, however, both expenditure and prices drop upon retirement. Although we find that households seem to pay less on average as they age in both periods, there are only significant differences between households aged 55–59 and those 65+ in the latter period (after controlling for household size).[29] When using the ECPF-97 our findings are analogous to those of Aguiar and Hurst (2007a) and retired-age households, those 65–75, pay roughly 1.4 percent less for the basket of goods they purchase than households 55–64 (when not controlling for income as Aguiar and Hurst 2007a).

We also exploit the panel dimension of our survey and use a fixed-effects specification to control for permanent unobserved heterogeneity. Results are summarized in Table 5. Overall there is a significant correlation between retirement and paying lower prices, and the result is mainly driven by the latter sample period, validating the previous results from cross-section analysis.[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 intensity may not be possible in small towns with limited shopping venues.[31] Controlling for town size doubles the coefficient on the retirement dummy in absolute value, suggesting that households pay on average 1.6 less upon retirement and that the result is driven by those not living in small towns. The effect is slightly larger for those who retire in the later survey period, 1.9 percent, column (3).[32]

Food Expenditure in ECPF-97: The Role of Home Production and Household Specialization

Expenditure and price evidence for the later years of our survey are consistent with the home-production hypothesis. In this section, we use complementary time-diary evidence from the 2002 Spanish Time-Use Survey (STUS) and information on the number of meals available

[29]For the first period, the p-values for the test of equality of the dummies for ages 65–75 and ages 55–59 are 0.0004, 0.63, 0.866 in columns (1), (2) and (3) of Panel A, respectively. For the second period, the p-values are 0.015, 0.0001, 0.187 in columns (1), (2) and (3) of Panel B, respectively.

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

[31]Small town is defined as a town with less than 50,000 inhabitants which is not a province capital. It was not possible to create a 'very small town' dummy because of the inconsistencies in town density definitions across the two periods.

[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.

in the ECPF-97 to directly analyze the patterns of home-production time upon retirement, particularly grocery shopping and cooking, for the latter period of our study. 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 D-3 in Appendix D reports the average minutes per week that men and women devote to four major activity groups over the life cycle (personal care, work/study activities, housework, and leisure).

Panels A and B in Table 6 present results from regressions similar to the life-cycle price regressions in Table 4, where the dependent variables are minutes of shopping and cooking per week, respectively.[33] Grocery shopping time is distinct from time spent ordering takeout food, or time spent at restaurants. The STUS does not include time spent traveling 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 first column in each panel presents results for men, the second column results for women, and the third column results for the average time of head and spouse for a sample of households similar to that in the expenditure regressions. (An advantage of the STUS over the American Time-Use Survey (ATUS) is that, unlike the ATUS, the STUS records time-diary information for all household members, which allows us to check not just individual home-production times but the reallocation of time between spouses upon retirement.) As in Section 4, we use a sample of respondents aged 25–75.

Shopping time increases over the life cycle for men, with the largest increase happening after age 65, similar to the shopping patterns observed in the US (see Aguiar and Hurst 2007a). In particular, men aged 45–49 spend about 42 additional minutes per week shopping than men younger than 30 and the difference widens to 65 minutes for men aged 65–75; shopping time for the reference group is of 72 minutes per week. Looking at the male sample only could be misleading because men and women (and thus household time) follow very different paths

[33] All regressions include day of the week, quarter and year dummies, as well as region dummies, income dummies and household size controls.

over the life cycle. Women, column (2), increase grocery shopping time until ages 45–49, when they spend about 106 more minutes per week shopping than the comparison group who spends 156 minutes. After that, the time women devote to grocery shopping starts to decrease, and women in the 65–75 age range only spend 51 minutes per week more on shopping than the reference group. Thus, there seems to be a substitution between men and women when it comes to shopping time, as women start to substantially reduce shopping time after the age of 55. Column (3) of Table 6 reports results from regressing the average shopping time for couples on heads' age for households headed by males, the households considered in our expenditure regressions (if the household head has no spouse, the shopping time is simply that of the head). When we combine men's and women's shopping time, we observe an increase in shopping time till ages 50–54, when households spend 57 more minutes on shopping per week than the reference group. Then, household shopping time decreases a bit but picks up again for those 65–75, who spend about 54 more minutes on shopping per week than the reference group.

Panel B in Table 6 shows results for cooking time. Men, column (4), increase cooking time by 61 minutes relative to the reference group by age 40–44, only to reduce cooking time again so that those 60–64 devote only 29 more minutes per week to cooking than the reference group who spends roughly 122 minutes. After retirement age, however, cooking time picks up again and men aged 65–75 devote 42 minutes more than the reference group to cooking. Women's cooking time monotonically increases with age up to age 64, when it decreases slightly. Women 60–64 years old spend 615 more minutes per week on cooking activities than the reference group of women aged 25–29 (who spend 430 minutes per week), while women 65–75 spend 595 more minutes. Column (6) shows increases in the time that head and spouse spend on cooking activities over the entire life cycle, suggesting, as in the case of shopping, that men's increases in home-production activities over the life cycle (and particularly at typical retirement ages) compensate for the decrease in the time women devote to such activities.

Overall the evidence on time use is consistent with a household model where a drop in the head's relative market wage upon retirement leads to a reallocation of time within the household, with an increase in the head's time devoted to home production and a decrease in the spouse's time—in our case, there is an overall (small) time increase in the total time households spend on shopping and cooking activities around retirement.[34] It is possible that the life-cycle changes we

[34]The implications on the total time households devote to home production in a home-production model are ambiguous and ultimately depend on the shape of the home-production function and the relative home-labor productivity of the spouses. In the case in which bargaining power is determined by relative income, a drop in

document might be picking up cohort effects (the STUS is a cross-sectional survey). If this was the case, however, we would expect no increases in men's cooking/shopping time and increases in women's cooking/shooping time with age as older cohorts generally hold more traditional gender roles. Thus, the finding of an increase in men's time which compensates the decrease in women's time, especially at retirement ages, may well constitute a lower-bound of the true increase in housework upon retirement.

Table 7 presents results from running regressions with the logarithm of meals per capita on the left hand side, which increases monotonically with age.[35] The substitution of food away from home for food at home upon retirement, together with the patterns of shopping and cooking time upon retirement documented in Table 6, support the home-production hypothesis as an explanation for the decline in food expenditure in the latter period of our survey. These findings also suggest that the lower average prices paid by retirees in the latter period of the survey do not result from retirees buying cheaper goods within a category, but rather are associated with genuine increases in the time retirees devote to shopping (for example, by looking for bargains).

Explaining the differences between the two periods

As in the US, and consistent with a home-production model, food expenditure and average prices drop at retirement in Spain in the latter period of the survey. In the earlier period, however, neither food expenditure nor average prices change significantly around retirement. In this section we argue that the differences between the two periods are still consistent with the home-production model in a context of changing social norms. The head's retirement results in a lower relative market wage that should lead to a reallocation of time within the household, resulting in increases of home production time by the head and decreases by his spouse (see Lundberg, Startza, and Stillman 2003). Traditional norms about the household division of labor in the earlier period may have, however, prevented the reallocation in home-production time between spouses upon retirement that would have been efficient otherwise. Thus, expenditure in the earlier period of our survey does not change at retirement because home-production does

head wages upon retirement shifts the bargaining power over to the spouse, which leads to a reallocation of home-production time (and thus leisure) between spouses, but also to a new production possibilities frontier where the total home-produced good is higher as long as the spouse has a higher preference for the home-produced good (see Lundberg, Startza, and Stillman 2003).

[35]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 C-3 for further summary statistics.

not change with retirement. More egalitarian social norms in the latter period may have allowed spouses to freely reallocate time resources upon retirement resulting in the substitution of market goods for home-produced goods and the drop in food expenditure observed in the later years of the survey.[36]

The period of our study is indeed a period characterized by rapid socio-economic change, 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 2009). Female labor force participation increases 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-earner couples represent one third of all households, in 2000 they reach 45 percent—see Franco and Winqvist (2002). Evidence from other developed countries suggests that increases in female labor force participation are accompanied by higher men participation in home-production activities. For the US, Aguiar and Hurst (2007b) report an increase in non-market work by men of almost four hours per week between 1975 and 2003, which is very similar to the increase of three and a half hours per week in women's market work over the same period.[37]

We explore the role of household specialization and changing social norms by looking separately at households with and without a dedicated homemaker in each period of the survey. The testable hypothesis is that in societies with rigid gender stereotypes only more egalitarian households with a non-traditional division of labor experience a reallocation of household time upon retirement. However, a move towards more egalitarian gender roles leads to a widespread shift towards a more efficient allocation of time at retirement for most households, egalitarian or not, as social norms do no longer bind.[38]

[36] Unfortunately, we do not have time-diary data for the earlier period to directly test this hypothesis. The only evidence available for Spain for earlier years comes from The Basque Country, a northern Spanish region, whose statistical office 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 (http://www.eustat.es) show that housework time increases for respondents over 60 by more than half an hour per week between 1993 and 2008. This increase for older individuals is more remarkable in the face of the decrease in housework time (by 32 minutes per day) experienced by younger individuals over the same period, which suggests that decreases in women's housework time over the period are more than compensated by increases in men's housework time after age 60. Micro-level data for these surveys are not currently available, so gender comparisons are not feasible.

[37] 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.

[38] Anecdotal evidence suggests that while grocery shopping by men 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,

We characterize traditional households as those with a dedicated homemaker in the household when the head is first interviewed, and investigate whether the prices paid during retirement and expenditure patterns vary by household type. 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" when 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 several years before the head retires, but this is not possible because of the short panel length of the survey. Table C-3 in Appendix C 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).[39]

Table 8 presents similar life-cycle price regressions to those presented in Table 4, including a homemaker dummy and interactions of age dummies at typical retirement ages with a no-homemaker indicator (single heads or married heads with no homemaker). Panel A, columns (1) to (3), focuses on the ECPF-85. Households with a homemaker pay on average 1.6 percent less. Households 65–75 with no homemaker pay 0.9 percent less (after removing the homemaker effect) than other households in that age group. We obtain a slightly bigger effect, 1.1 percent, when interacting an indicator for ages 60–75 and the no-homemaker dummy to account for early retirement in column (2). Although we cannot disentangle the effect of retirement from age with these regressions, we also try an additional specification, column (3), 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

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 about retirees, poems and talks by retirees to other retirees, e.g. http://www.educa.madrid.org/web/ies.principefelipe.madrid/tablon/jubilacion2006.pdf.

[39] Results are robust to alternative definitions of the homemaker dummy. For example, we look at household with a dedicated homemaker in all survey years, and results follow.

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.[40] In panel B of Table 8, 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. Also, the overall effect on prices of having a homemaker in the household is about half of that in the previous period.[41]

Expenditure patterns are in line with the average price results shown in Table 8. We find that households without a homemaker retiring within the ECPF-85 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 in total and at-home food expenditure—see Table 9.[42]

Results from Tables 8 and 9 reveal that the patterns of average prices and spending in both periods of the survey are consistent with the standard home-production model in the literature properly augmented with social norms regarding the division of household labor. In the earlier period, only households with no homemakers (i.e., more egalitarian households) pay less on average for the food basket they consume (and thus spend less on food) upon retirement, whereas all household (regardless of their division of household labor pre-retirement) experience decreases in average prices and spending in the later years of the survey (differences across households with and without a dedicated homemaker are not statistically significant). These patterns are consistent with traditional households following more traditional gender roles in the earlier period of the survey, and more egalitarian gender roles in the latter period of the survey.

5 Conclusion

This paper documents that there is no retirement-consumption puzzle in Spain during the period of 1985–2004. Although there is a nondurable expenditure drop at retirement in some specifications, it can be explained by a decrease in work-related expenses such as clothing, transportation,

[40] Retired/60+ 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.

[41] The 65+ dummy captures the oldest cohorts who may react less strongly to changes in social norms.

[42] In a fixed-effects framework, we were not able to obtain significant differences in paid prices by household type in either period.

and restaurant meals. Consistent with other studies, households who are affected by an unexpected negative shock near retirement, such as an adverse health shock, decrease expenditure at retirement.

Interestingly, food spending substantially decreases upon retirement in the latter period of our sample but not in the earlier period. Household-specific price indices constructed from available information on purchased food quantities in the survey suggest that, as in the US, households pay less for the basket of goods they purchase as they age, but only in the latter period there are significant differences at retirement. Time-use evidence indicates that male retirees devote more time to shopping and cooking and increase the number of meals at home over the life-cycle, especially beyond age 65, which could explain the decrease in food expenditure upon retirement.

Differences between the two periods in the behavior of food spending at retirement are consistent with an augmented life-cycle model of consumption and home production once the division of labor within the household is taken into account. We propose a theory in which traditional norms about the household division of labor prevent the reallocation of home-production time between spouses that would otherwise be expected after a change in relative wages upon retirement. In traditional societies, efficiency gains from head-of-household retirement in terms of additional savings from shopping or cooking are not realized in less egalitarian households because the specialized homemaker continues to do all housework after the head retires. Consistent with this hypothesis, we find that only egalitarian households (those without a dedicated homemaker who are less likely to be bound by traditional social norms) pay lower average prices and reduce spending on food at home at retirement in the earlier years of the survey. In the later 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 or average prices at retirement as all household types (with or without homemakers) reduce expenditure. We believe that, as happened in other developed countries, the sharp increase in female labor force participation over our sample period brought along changes in household roles that have affected all household types to some extent. Unfortunately, time-use data for the earlier period of the survey does not exist for Spain, which limits our ability to test this hypothesis further.

To conclude, it seems that Spanish retirees may not be worse off upon retirement, at least early on into the process. Table D-3 shows that leisure is fairly constant over the life-cycle, increasing slightly upon retirement. Further evidence is presented in Table 10, 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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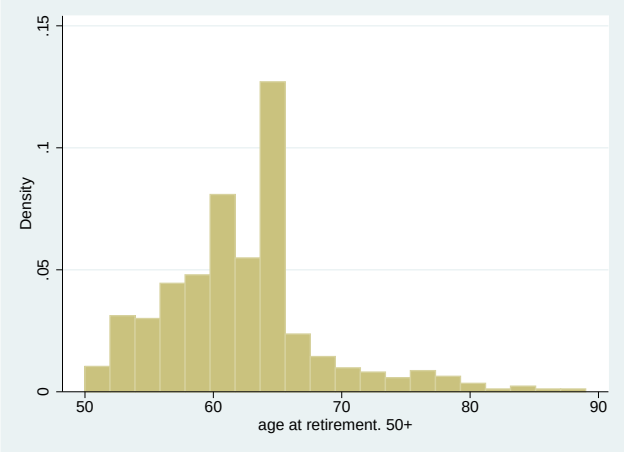
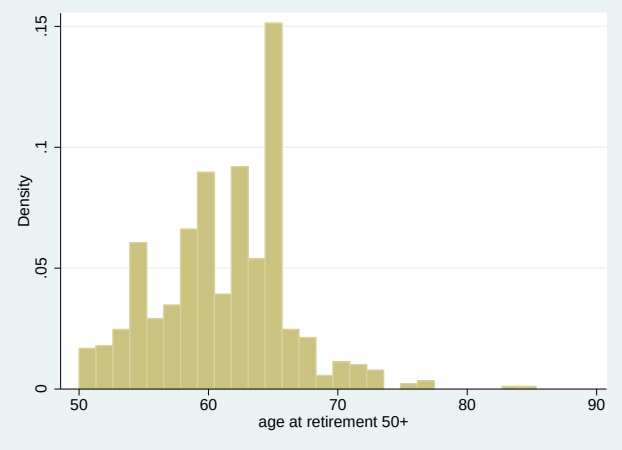
Figure 1: Distribution of Retirement Ages

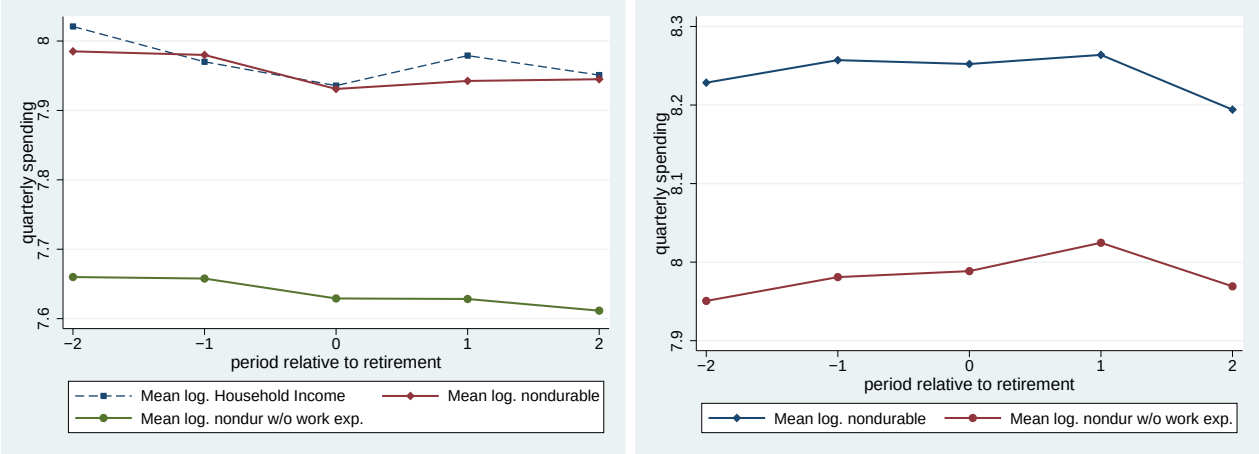


(a) ECPF85

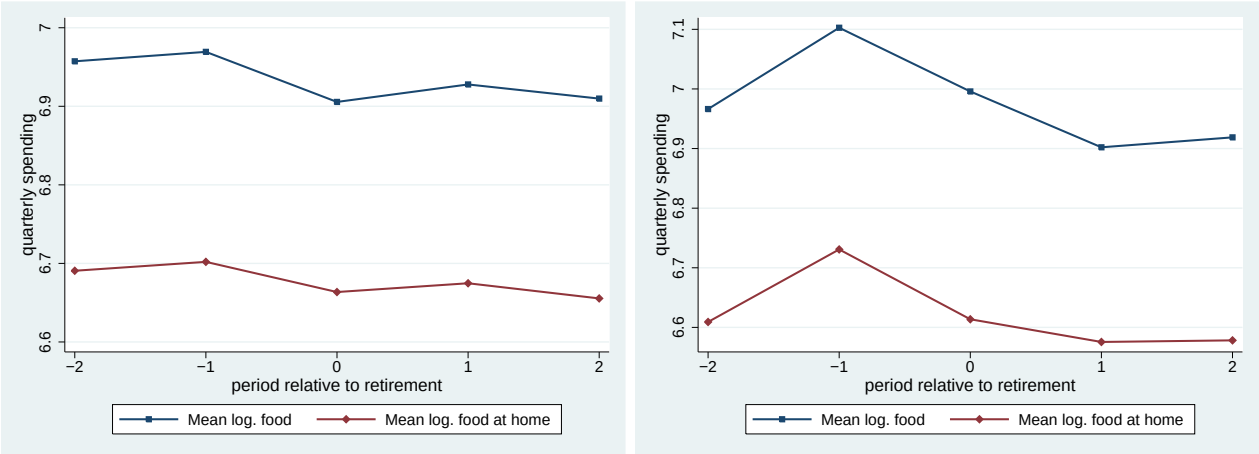


(b) ECPF97

Figure 2: 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	—	—	—	—	—
$\Delta \log C_1$	–0.00	0.37	–2.04	2.17	7044	—	—	—	—	—
$\Delta \log C_2$	–0.01	0.37	–2.05	2.05	7044	—	—	—	—	—
Δ log Food	–0.00	0.45	–3.07	3.20	7044	—	—	—	—	—
Δ log Food at Home	–0.01	0.50	–3.83	3.88	7044	—	—	—	—	—
Δ log HH Income	0.01	0.38	–3.12	3.12	6395	—	—	—	—	—
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 male 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
ECPF-85 and ECPF-97- 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
ECPF-85 and ECPF-97- 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 transportation. 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, α_i is a household fixed effect, $\tilde{R}_{it}$ 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%. Income information is only available for the ECPF-85.

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
	(d) Retiring due to health shocks–ECPF-97 only					
Retired dummy	0.001	–0.016	–0.002	–0.097**	–0.076	—
	(0.02)	(–0.68)	(–0.08)	(–2.10)	(–1.43)	—
inter	–0.010	–0.033	0.018	–0.215**	–0.139	—
	(–0.17)	(–0.72)	(0.31)	(–2.04)	(–1.10)	—
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 transportation. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda\,(\tilde{R}_{it} \times I_i) + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, α_i is a household fixed effect, $\tilde{R}_{it}$ 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%. Income information is only available for the ECPF-85.

Table 4: Life Cycle Prices

	Panel A: ECFP-85			Panel B: ECPF-97		
	(1)	(2)	(3)	(4)	(5)	(6)
30–34	0.005	0.011***	0.010**	0.000	0.004	0.002
	(1.31)	(2.65)	(2.38)	(0.03)	(0.57)	(0.25)
35–39	–0.003	0.006	0.007*	–0.003	0.004	0.001
	(–0.74)	(1.49)	(1.67)	(–0.46)	(0.61)	(0.16)
40–44	–0.017***	–0.005	–0.003	–0.010	–0.002	–0.004
	(–4.06)	(–1.25)	(–0.82)	(–1.57)	(–0.26)	(–0.67)
45–49	–0.024***	–0.012***	–0.011***	–0.009	–0.001	–0.007
	(–5.61)	(–2.80)	(–2.68)	(–1.35)	(–0.09)	(–1.03)
50–54	–0.032***	–0.023***	–0.024***	–0.013**	–0.006	–0.016**
	(–7.76)	(–5.41)	(–5.70)	(–2.02)	(–0.92)	(–2.47)
55–59	–0.039***	–0.034***	–0.032***	–0.018***	–0.014**	–0.023***
	(–9.40)	(–8.06)	(–7.78)	(–2.76)	(–2.25)	(–3.57)
60–64	–0.036***	–0.035***	–0.033***	–0.026***	–0.026***	–0.026***
	(–8.58)	(–8.36)	(–7.80)	(–3.86)	(–4.05)	(–4.12)
65–75	–0.029***	–0.034***	–0.032***	–0.034***	–0.040***	–0.031***
	(–7.18)	(–8.54)	(–7.96)	(–5.35)	(–6.44)	(–5.01)
log hh. size		–0.026***	–0.041***		–0.031***	–0.059***
		(–12.66)	(–18.98)		(–13.27)	(–24.08)
log no. items		–0.006***	–0.009***		–0.194***	–0.188***
		(–2.70)	(–4.08)		(–35.68)	(–35.91)
log. of hh. income			0.024***			
			(21.81)			
Income dummies	–	–	–	NO	NO	YES
F	64.6	66.8	85.4	178.3	207.3	238.5
N	128264	128264	117346	76374	76374	76048

Notes: The regression specification is $\log \widehat{p}_{it} = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it}$, 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. In Panel B, we also include dummies for the region of residence not available in the ECPF-85. Robust standard errors clustered by household. Sample of households with heads aged 25–75. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 5: Life-cycle prices around Retirement. Panel estimates.

	(1)	(2)	(3)
Retired dummy	–0.008	–0.016**	–0.019**
	(–1.51)	(–2.02)	(–2.09)
Retired, small town		0.015	0.014
		(1.40)	(1.34)
Retired, earlier period			0.010
			(1.05)
F	1.43	1.44	1.38
N	3390	3390	3390

Notes: The regression specification is $\log \widehat{p}_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda \left(\tilde{R}_{it} \times I_i\right) + \gamma X_{it} + \varepsilon_{it}$, 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, α_i is a household fixed effect 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 6: Home-Production Time over the Life-cycle Using 2002 STUS

	Panel A: Shopping			Panel B: Cooking		
	Men	Women	Average Spouses	Men	Women	Average Spouses
	(1)	(2)	(3)	(4)	(5)	(6)
30–34	18.907**	42.179***	9.019	28.482***	174.450***	44.442***
	(2.52)	(4.20)	(0.83)	(3.35)	(11.30)	(2.94)
35–39	30.731***	52.590***	22.650**	55.229***	264.306***	81.848***
	(4.13)	(5.34)	(2.19)	(6.47)	(17.72)	(5.58)
40–44	32.861***	75.296***	34.947***	61.441***	375.062***	108.958***
	(4.38)	(7.48)	(3.33)	(7.24)	(23.79)	(7.42)
45–49	42.180***	106.296***	44.013***	50.032***	430.833***	141.225***
	(5.39)	(9.91)	(4.16)	(5.87)	(26.40)	(9.49)
50–54	39.046***	104.273***	57.029***	32.054***	520.342***	160.467***
	(4.90)	(9.82)	(5.21)	(3.61)	(30.58)	(10.48)
55–59	41.546***	85.194***	50.585***	36.852***	610.014***	205.127***
	(5.06)	(8.22)	(4.78)	(3.51)	(35.20)	(12.84)
60–64	49.549***	74.447***	46.617***	28.569***	614.639***	225.698***
	(5.88)	(6.92)	(4.43)	(2.68)	(32.83)	(14.06)
65–75	64.879***	51.360***	53.744***	42.712***	595.366***	233.833***
	(8.63)	(5.57)	(5.49)	(4.71)	(38.25)	(16.31)
Log hh. size	–22.627***	15.525**	20.630***	–131.473***	317.322***	144.126***
	(–4.51)	(2.44)	(4.08)	(–20.33)	(30.52)	(19.71)
F	13.798	63.934	33.374	18.334	110.186	36.896
N	15373	17485	13303	15373	17485	13303

Notes: The regression specification is $T_i = \alpha + \beta X_t + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_t$, where T_t is weekly minutes spent on shopping and 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 respondents ages 25–75. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 7: Meals at Home. ECPF-97

	(1)	(2)	(3)
30–34	0.015*	0.011	0.013
	(1.66)	(1.19)	(1.48)
35–39	0.044***	0.035***	0.038***
	(5.09)	(4.15)	(4.43)
40–44	0.071***	0.061***	0.063***
	(8.43)	(7.25)	(7.59)
45–49	0.079***	0.069***	0.073***
	(9.43)	(8.17)	(8.78)
50–54	0.085***	0.075***	0.081***
	(10.03)	(8.90)	(9.78)
55–59	0.104***	0.097***	0.103***
	(12.38)	(11.62)	(12.41)
60–64	0.124***	0.121***	0.123***
	(14.46)	(14.25)	(14.57)
65–75	0.144***	0.146***	0.143***
	(17.36)	(17.86)	(17.60)
log hh. size		0.026***	0.039***
		(8.67)	(12.55)
Income dummies	NO	NO	YES
F	45.4	47.1	52.6
N	76374	76374	76048

Notes: 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 and regional dummies. Robust standard errors clustered by household. Sample of households ages 25–75. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 8: Life Cycle Prices, Retirement and Household Type

	Panel A: ECFP-85			Panel B: ECPF-97		
	(1)	(2)	(3)	(4)	(5)	(6)
30–34	0.010**	0.010**	0.010**	0.000	–0.000	–0.004
	(2.35)	(2.39)	(2.43)	(0.01)	(–0.01)	(–0.59)
35–39	0.007	0.007*	0.008*	0.002	0.001	–0.006
	(1.63)	(1.72)	(1.81)	(0.24)	(0.21)	(–0.69)
40–44	–0.003	–0.003	–0.002	–0.000	–0.001	–0.014
	(–0.81)	(–0.69)	(–0.49)	(–0.03)	(–0.08)	(–1.49)
45–49	–0.011***	–0.011**	–0.009**	–0.001	–0.001	–0.019*
	(–2.60)	(–2.48)	(–2.14)	(–0.09)	(–0.15)	(–1.85)
50–54	–0.023***	–0.023***	–0.019***	–0.009	–0.009	–0.024**
	(–5.29)	(–5.16)	(–4.41)	(–1.35)	(–1.41)	(–2.30)
55–59	–0.031***	–0.030***	–0.025***	–0.015**	–0.015**	–0.028**
	(–7.12)	(–7.00)	(–5.62)	(–2.30)	(–2.37)	(–2.47)
60–64	–0.030***	–0.026***	–0.019***	–0.019***	–0.018**	–0.024**
	(–6.83)	(–5.58)	(–4.03)	(–2.83)	(–2.57)	(–2.07)
65–75	–0.025***	–0.024***	–0.009*	–0.019***	–0.022***	–0.022*
	(–5.63)	(–5.37)	(–1.83)	(–2.90)	(–3.30)	(–1.76)
log hh. size	–0.035***	–0.036***	–0.036***	–0.059***	–0.058***	–0.058***
	(–15.35)	(–15.49)	(–15.73)	(–22.48)	(–22.38)	(–22.28)
log no. items	–0.007***	–0.007***	–0.007***	–0.189***	–0.189***	–0.189***
	(–3.38)	(–3.39)	(–3.35)	(–35.95)	(–35.95)	(–36.03)
Young children	–0.000	0.000	0.000	0.014***	0.014***	0.014***
	(–0.13)	(0.02)	(0.13)	(4.37)	(4.31)	(4.23)
Homemaker	–0.016***	–0.018***	–0.018***	–0.009***	–0.008***	–0.006***
	(–9.04)	(–9.49)	(–9.28)	(–4.02)	(–3.33)	(–2.85)
Age 65–75 × no homemaker	–0.008*			–0.008*		
	(–1.84)			(–1.80)		
Age 60–75 × no homemaker		–0.011***			–0.002	
		(–3.04)			(–0.63)	
Retired			–0.017***			–0.006*
			(–5.48)			(–1.79)
Retired × no homemaker			–0.008**			–0.004
			(–2.16)			(–1.09)
F	80.9	81.3	81.8	224.2	224.2	223.6
N	117346	117346	117346	76048	76048	76048

Notes: The regression specification is $\log \widehat{p}_{it} = \alpha + \beta X_{it} + \sum_{\lambda=2}^{9} \gamma_\lambda Age_{i\lambda} + \varepsilon_{it}$, 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, and town density dummies. In Panel B, we also include dummies for the region of residence not available in the ECPF-85. Income controls in both panels, the log of household income in Panel A and income dummies in Panel B. Robust standard errors clustered by household. Sample of households with heads aged 25–75. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 9: 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 transportation. 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, α_i is a household fixed effect 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table 10: 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 Sample		
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, α_i is a fixed effect 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Appendix A: Expenditure over the life cycle

Figure A-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 $Fam.Composition_{it}$ 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 A-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.[43] In panel (b), we plot total food expenditure and food at home.[44]

The expenditure patterns depicted in Figure A-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, it 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 A-1. Also, one has to be careful with sample composition changes. We analyze if the decline in expenditure later in life is related to retirement in Section 3.

Appendix B: Robustness Analysis

Alternative samples and expenditure categories

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.

[43] 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.

[44] Alternatively, we could construct the Figure A-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.

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 B-1 and B-2 for the whole and retiring samples, respectively.

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 be 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 B-1 and B-2)

Another concern relates to income measurement. Households are asked to provide income 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 artificial differences in the recorded income and expenditure numbers 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 B-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 are heavily subsidized 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.

Robustness results for the ECPF-97 are presented in Tables B-3, B-4 and B-5. Only when including households 50+ in our regressions, and for a retiring sample only, do we loose significance on the coefficient for retirement in the food expenditure regressions, as we are perhaps including in our sample very young retirees who likely received some degree of bonus payment due to negotiated pre-retirement.

Income levels

The ECPF-85 has detailed income information including a variable created by the INE

which assigns households to national income quartiles. We explore if there are differences in the behavior of expenditure at retirement for the income poor and the income rich (defined as of before retirement). Table B-6 summarizes our findings for the ECPF-85. Interestingly, household income increases upon retirement for the income-poor possibly because of the minimum pension, while it decreases significantly for the income-rich. The estimated effect of retirement on total expenditure and nondurable expenditure is larger for the income-rich (the opposite for food spending), but the differences between the two groups are not statistically significant, and none of the estimated coefficients for expenditure are statistically different from zero.

Information on household income in the ECPF-97 is much poorer and we must rely on self-reported income intervals (four income brackets). We classify households as rich (poor) if they retire after reporting being in the highest income bracket in one of the three periods before retirement. The results reported in Table B-6 suggest that the findings regarding food expenditure declines at retirement in the latter period are not just driven by the very poor and are stronger when excluding the very rich.

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) 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.[45]

[45] We also try specifications which include dummies for one or two periods before and after retirement but these

The top panel of Table B-7 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 but no 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 B-7). These results are very similar to those reported in Table 2 (third panel).

Appendix C: Life-Cycle Prices

Quantity Items

Tables C-1 and C-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).

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.

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 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, red and rose 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).

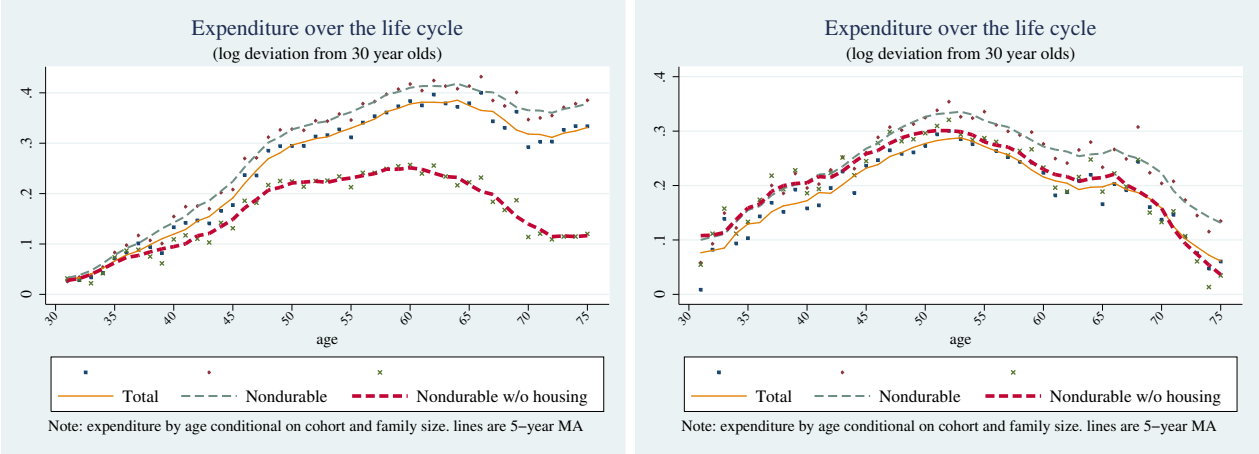
Appendix D: The Spanish Time-Use Survey

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, as well as 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 D-2 lists the major categories and subcategories.

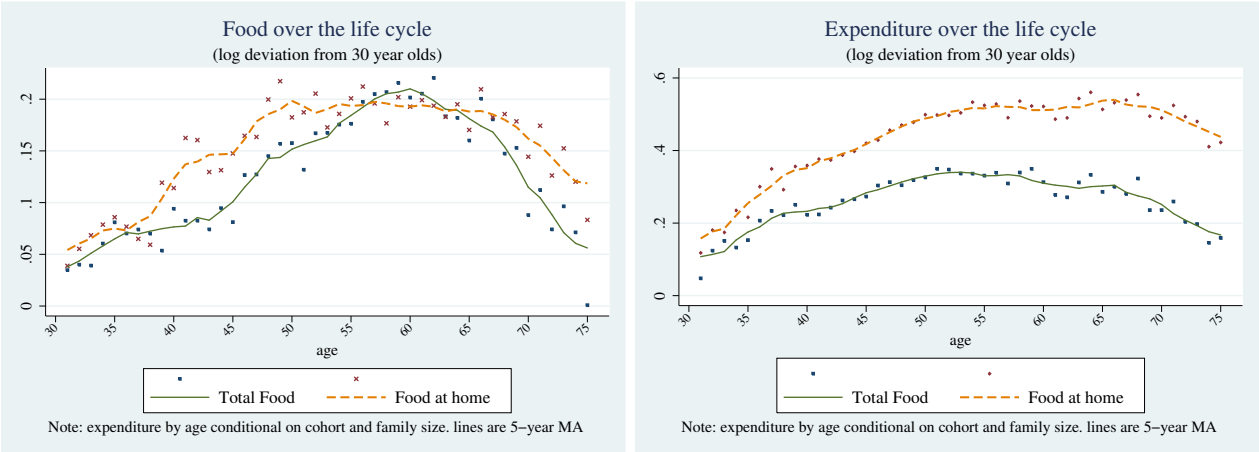
Fernandez, Gimenez-Nadal, and Sevilla-Sanz (2010) present a comparison between the STUS and the Spanish Labor Force Survey (EPA), a well-known representative panel dataset of the Spanish labor market, and show that the main demographic and economic variables in both data sets are similar.

Table D-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 slightly.

Figure A-1: Life-cycle Profiles for Expenditure



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



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

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

	Nondurable C_1	Nondurable 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 transportation 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, α_i is a household fixed effect, $\tilde{R}_{it}$ is a retired dummy (equal to 1 if the household is retired and 0 otherwise), and X denotes additional controls. 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table B-2: Expenditure at Retirement. Robustness II (Retiring ECPF85 Sample)

	Nondurable C_1	Nondurable 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 transportation. 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table B-3: Expenditure at Retirement. Robustness I (Whole ECPF97 Sample)

	Nondurable C_1	Nondurable 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 transportation. 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

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

	Nondurable C_1	Nondurable 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 transportation. 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

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

	Nondurables exp.								Total exp.
	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 transportation; 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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table B-6: Expenditure (Log level) around Retirement by Income

	Total Expenditure	Nondurables C_1	Nondurables C_2	Total Food	Food at Home	Household Income
			(a) Income Poor–ECPF-85			
Retired dummy	–0.000	–0.024	–0.005	–0.023	0.004	–0.069***
	(–0.01)	(–1.26)	(–0.29)	(–0.86)	(0.13)	(–2.66)
Retired, bottom Inc. Quartile	–0.006	–0.002	–0.006	–0.017	–0.039	0.124***
	(–0.17)	(–0.05)	(–0.19)	(–0.45)	(–0.89)	(2.78)
			(b) Income Rich–ECPF-85			
Retired dummy	0.005	–0.017	–0.001	–0.027	–0.004	0.006
	(0.22)	(–0.94)	(–0.05)	(–1.08)	(–0.14)	(0.22)
Retired, top Inc. Quartile	–0.034	–0.039	–0.034	–0.006	–0.026	–0.172***
	(–0.80)	(–1.01)	(–0.86)	(–0.12)	(–0.54)	(–3.77)
N	2303	2303	2303	2303	2303	2142
			(a) Income Poor–ECPF-97			
Retired dummy	0.001	–0.011	0.001	–0.083*	–0.068	—
	(0.03)	(–0.43)	(0.04)	(–1.75)	(–1.26)	—
Retired, Low Income	–0.005	–0.033	–0.005	–0.133	–0.080	—
	(–0.12)	(–0.91)	(–0.15)	(–1.63)	(–0.88)	—
			(b) Income Rich–ECPF-97			
Retired dummy	–0.001	–0.019	–0.006	–0.121**	–0.104*	—
	(–0.04)	(–0.76)	(–0.27)	(–2.48)	(–1.84)	—
Retired, High Income	0.009	0.000	0.038	0.035	0.105	—
	(0.14)	(0.00)	(0.79)	(0.34)	(1.06)	—
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 transportation. Regression: $\log C_{it} = \alpha_i + \beta \tilde{R}_{it} + \lambda\,(\tilde{R}_{it} \times I_i) + \gamma X_{it} + \varepsilon_{it}$, where C_{it} is real consumption for household i in period t, α_i is a household fixed effect, $\tilde{R}_{it}$ is the retired dummy, I_i is an indicator for income group, 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. ECPF-85 classifies households in national income quartiles. The income quartile used to construct our dummies is the higher income quartile in the three quarters before to retirement. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table B-7: Expenditure Changes around Retirement. ECPF-85. Growth-rate specification

	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. t-statistics in parentheses. *** (**) [*] significant at the 1 (5) [10]%.

Table C-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 C-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 C-3: Summary Statistics for section 4

	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 × no homemaker	0.07	0.26	0.00	1.00	0.10	0.29	0.00	1.00
60–75 × 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 D-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 D-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: The 2002 STUS, standard errors in parenthesis.

Table D-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 the 2002 STUS, measured in minutes per week.