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Demand Patterns Around Retirement: Evidence from Spanish Panel Data*

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Abstract

One of the explanations of the consumption-retirement puzzle put forward in the literature is non-separabilities between work and consumption. In this paper we examine demand patterns before and after retirement, using a Spanish panel data set on household expenditures, in which we follow households across the retirement threshold. Usually, two incidents occur simultaneously at retirement: (1) Income falls significantly and (2) leisure time increases. We provide evidence that there is no such income fall for the retiring households in the Spanish data. This means that what we identify with this data is the pure impact of retirement. We examine the effect of retirement on budget shares. We find *no* significant effect on any commodity groups (except on medicines, which are subsidized upon retirement in Spain), i.e. we find no evidence of non-separabilities between work and consumption at retirement.

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1 Introduction

The standard modeling framework for analyzing the consumption-savings decision of the household is life cycle models. Whatever the variant, then the key prediction of life cycle models is that individuals should smooth consumption, in the sense of holding marginal utility of consumption constant, across the different stages of life. Theory thus predicts that marginal utility of consumption should be smoothed across the retirement threshold. But it is empirically well-established that both in the U.K. (Banks, Blundell and Tanner (1998)) and in the U.S. (Bernheim, Skinner and Weinberg (2001)) there is a one-off drop in consumption at the time of retirement. Both papers argue that this drop can not be fully explained by a life cycle model with rational forward-looking agents that smooth consumption over anticipated income changes without the advent of some new information arising at retirement. This phenomenon has been known as the retirement-consumption puzzle (or the retirement-savings puzzle).

One explanation of the retirement-consumption puzzle could lie in the non-separabilities between work and consumption. For example, not going to work anymore may lower expenses on transportation and on work clothes. Or that of home production: Not going to work anymore may free time for example for maintaining the house yourself instead of paying somebody else to do it. Such substitutions of home production for market goods may also lower expenditures. Another possible explanation of the puzzle is that *unexpected* shocks with negative implications for income occur around retirement. For example that an individual is forced to retire earlier than expected and thus ends up with lower wealth at retirement than expected. None of the explanations are in contradiction to life cycle model theory.

What we usually see in the data, is that two incidents occur simultaneously at retirement: (1) Leisure time increases as a consequence of not working anymore and (2) income falls[1]. Because they happen simultaneously, their effects on consumption may be confounded. Moreover, it is difficult to assess whether an observed income drop is anticipated or unanticipated.

In this paper, we examine demand patterns before and after retirement, using a Spanish panel data set, the Encuesta Continua de Presupuestos Familiares (ECPF). The ECPF is a household level panel data set covering the period 1985-97 with expenditure information on a wide range of commodity groups, with information on several income categories and with information on labor market status and is thus extremely well suited for analyzing the issue of consumption and demand changes around retirement. We consider the households that retire at age 60 and above and argue that it is very likely that most of

[1] Both Banks et al. and Bernheim et al. document income falls at retirement.

these households do *not* retire unexpectedly. Further, we find quite astonishingly that these households experience no significant income fall at retirement. With these two things put together, we almost have the perfect experiment: Households retire, but do not experience significant income drops. Hence, any changes in demands at retirement can be attributed solely to non-separabilities between work and consumption.

Banks et al. examine the Family Expenditure Survey (FES) 1968-1992 and Bernheim et al. examine the Panel Study of Income Dynamics (PSID) 1978-90 and both find that non-seperabilities between work and consumption can explain part, though not all, of the puzzle. Banks et al. find that consumption expenditures on work-related goods (classified as food eaten outside home, transportation and adult clothing) fall at retirement. However, Banks et al. are using repeated cross section data, so they do not observe individual retirements, but rather changes in the number of retiring household heads in a cohort. In other words, they do not observe changes in individual consumption across the retirement threshold, but rather changes in consumption from one household to the other as a result of whether the household is retired. In contrast, the ECPF is a panel and so we follow households directly as they retire. Turning to Bernheim et al., then the PSID is also a panel data set, but it only has records on food consumption (food eaten at home and food away from home, where they classify the latter as the work-related good) and is therefore not ideally suited for examining the question of non-separabilities between work and consumption. In contrast, the ECPF capture data on a full range of commodities. Bernheim et al., in addition to their analysis of the PSID, carry out an analysis of work-related goods (adult clothing, transportation, fuel, food at home and food away from home) using the Consumer Expenditure Survey (CEX) 1982-89. They find non-separabilitites at most wealth quartiles for most of the goods mentioned, but the CEX is a cross sectional data set, i.e. each household is observed only once, and thus they are not able to follow demand changes for the same household over the retirement threshold. Hurd and Rohwedder (2003) have a small section where they investigate the time use data in the Consumption and Activities Mail Survey (CAMS) of time use before and after retirement. They conclude that in principle the substitution of home production for market goods is large enough to explain a substantial part of the drop in consumption at retirement. But again, CAMS is a cross sectional data set.

As mentioned, it is a common feature of most studies investigating consumption around retirement that there is an income fall at retirement. Miniaci, Monfardini and Weber (2003) examine the retirement-consumption puzzle using Italian data, the Italian Survey on Family Budgets (SFB), which is also a cross sectional data set. They provide evidence that the households in their data could predict their pensions quite accurately and thus do not experience any unanticipated shocks to income. Further, Italian workers receive a large lump-sum payment at retirement, households do not experience any liq-

uidity problems at the time of retirement[2].They find evidence of non-separabilities since consumption of work-related goods falls at retirement and home production of food and other goods increases. Denton, Mountain and Spencer (2002) study Canadian expenditure data (the FAMEX). They conclude their paper with a simulation study in which they simulate demand patterns for households that experience no decrease in income at retirement. In these simulation studies, demands do not change significantly and the authors thus conclude that the observed differences in pre-retirement and post-retirement demand patterns are consequences of drops in income "rather than of a change in tastes"[3].

In this paper we investigate incomes, total non-durable expenditures and demands for non-durables around retirement in the ECPF. Because panel data sets on household expenditures is scarce, the standard method for investigating consumption around retirement is to construct a quasi-panel (or a pseudo-panel) of date-of-birth cohorts which enables us to follow these "pseudo-individuals" over time. Thus, in order to be able to compare our data with the findings of other studies, we first construct such a pseudo-panel of date-of-birth cohorts from our data and investigate what happens to incomes and total non-durable expenditures as these cohorts leave the labor market. We find that both total household incomes and total non-durable expenditures are relatively flat across the retirement threshold. Next we turn to an individual level analysis in order to exploit the panel structure of the data. The panel structure of the data aids in precision, which is important here: We know exactly who retires, not just the proportion, as in a cohort study. We select a sample of retiring households that we are able to follow across the retirement threshold. We carefully consider retirements that do not appear to come from an unanticipated shock or loss of employment. Next, we examine incomes around retirement for these households. It is a pronounced feature of the Spanish pension system as it were during the sample period that it created strong incentives for early retirement for workers in the lower end of the earnings distribution, in particular due to the so-called "minimum pension effect"[4]. We try to accurately measure earnings and pension income and model the rules and replacement ratios in the Spanish pension system for each household. From this analysis we find that the households in our sample have fairly high replacement ratios, a finding that is indeed supported by the rules of the Spanish pension system. We also carry out a regression analysis to compare incomes before and after retirement. We find that when controlling for demographics, there is no effect of retirement on income. This is true both in pooled estimations and in estimations taking account of unobservable household level heterogeneity. We do a similar regression analysis

[2]Miniaci et al. p. 3.

[3]Denton et al. p.17.

[4]Boldrin, Jimenez-Martin and Peracchi (1999), p. 341.

of total expenditure and find that there is no effect of retirement on total expenditure either, once demographics are controlled for. This is also true both in pooled estimations and in estimations taking account of unobservable household level heterogeneity. Having established that these households do not experience any significant drop in income at the time of retirement, we conclude that what we identify with this data is the pure impact of retirement. We therefore estimate a demand system in order to examine if households allocate expenditure differently to the different commodities as a consequence of the increase in leisure time. We find no significant effects of retirement on *any* budget shares (except on the budget share for medicine, which declines significantly after retirement, but this is simply because medicine is subsidized upon retirement). This finding holds in both the pooled estimations and in estimations taking account of unobservable household level heterogeneity. Finally, we repeat the analysis for a group of work-related expenditures and find, even more astonishingly, no significant effect of retirement.

The rest of the paper is organised as follows. In Section 2 we describe the Spanish pension system prevailing in the sample period (1985-97). In Section 3 we introduce the data. In Section 4 we construct a pseudo-panel of seven date-of-birth cohorts and present a graphic analysis of age profiles of incomes and total expenditures. In Section 5 we present the individual level analysis, here exploiting the panel structure of the data. Section 6 concludes and discusses further work.

2 The Spanish Pension System 1985-97

This section describes eligibility criteria, financing rules and other relevant features of the Spanish pension system for the period 1985-97. Our main reference for this section is Boldrin, Jimenez-Martin and Peracchi (1997), hereafter BJP. The main data sources used in BJP are two cross sectional micro data surveys carried out by INE - the Encuesta de Poblacion Activa (the EPA) which is a quarterly labor force survey and the Encuesta de Presupuestos Familiares (the EPF) which is a household expenditure survey of which BJP use the 1990-91 sample - as well as Administrative Records from the Social Security from the year 1993. Since we throughout define retirement according to the husband, all reported summary statistics in this section are for men only.

In the period our sample was collected, almost all pensions in Spain were public. This is shown in figure 8.11 in BJP [5]: The fraction of retirees receiving private pensions is less than 3% and moreover, this fraction is constant at all ages from 45 to 75. As

[5] The data for this figure is the EPF, which contains information on the different income categories earnings, assets, private pensions and public transfers.

BJP conclude, this shows the irrelevance of private pensions. Everything in this section therefore concerns public pensions only.

The official retirement age in Spain is 65, but it is allowed to retire early from age 60 in several pension programs. More than one third of those who retire under the most common pension program (the RGSS, see below) retire early [6]. In fact, the main point made in BJP is that the structure of the Spanish pension system creates strong incentives for some workers to retire early. This means that early retirement is not necessarily the result of a bad shock (like for example job loss and problems with finding a new job or a bad health shock).

We will return to the issue of early retirement again later in this section. First we describe the different types of pension and the different pension programs in Spain in the period 1985-97.

There are five types of public contributory pensions in the Spanish pension system: Old age pension, survivor pension, disability pension, orphan pension and other relatives pension. Old age and Survivor pension is by far the most common pension [7]: From age 59 to age 65 the fraction of men receiving Old age and Survivor pension grows from 10 percent to 40 percent and then at age 65 it jumps to more than 90 percent. The second largest pension is disability pension; the fraction receiving disability pension rises from 10 to approximately 15 percent over the age span 55 to 63-65 where it drops sharply to approximately 5 percent where it then stays constant. This could suggest that disability pension to some extent is used to "retire early". In the course of our sample period, however, disability is screened much more severely than was the case in the beginning of the 1980s [8]. In the ECPF we have no information about which type of pension a given retiree receives. But since our sample consists of households headed by married couples only, and since we define a household to be retired according to whether the husband is retired, it seems reasonable to assume that at least all retirees above age 60 receive Old age pensions. In the remainder, we therefore focus on Old age pensions.

There are six different programs of public contributory pensions: The General and Social Security Scheme (the RGSS), The Special Social Security Schemes (RESS), The government employees scheme (the RCP), The Special Funds, The Insurance Systems of Regional Government and Local Administrations and finally there is a number of small pension plans for institutions that have maintained their special treatment achieved under Franco despite of the process of homogenization that begun in the 1980s. These are institutions like for example the Bank of Spain, a number of formerly public banks, local

[6] BJP p. 324.

[7] The following numbers are from figure 8.10 in BJP; data for this figure is the EPF.

[8] BJP p. 337.

corporations and special branches of some regional governments. The Insurance Systems of Regional Government and Local Administrations are small programs for employees of certain regional governments or local administrations, and The Special Funds are small supplementary pensions, complementing the ones paid by RCP or RGSS. These three programs are all small, and indeed, the fraction covered by RGSS and RESS is very close to 1 [9].

The RGSS cover all private-sector employees, professionals, members of cooperative firms, employees of most public administration other than the central government, the clergy and unemployed individuals who comply with the minimum number of contributory years. The RESS cover self-employed, agricultural workers, domestic workers, sailors and coal miners. The self-employed and the agricultural workers represent 93 percent of the ones affiliated with the RESS. The RCP is the pension fund for the employees of the central government. In absolute numbers, the RGSS cover million 8.7 people, the RESS cover 3.7 million people and the RCP cover 806.000 people [10].

First we describe the financing rules of the RGSS program. Under the RGSS program, the official retirement age is 65, but it is allowed to retire early with a public pension from age 60 for those who became affiliated with the system before 1967. However, there is a penalty for retiring early in form of a lower replacement rate. Whether aged 65 or above or aged 60-64, then in order to be eligible for a pension one needs to have contributed to the system for at least 15 years of which at least 2 years must be within the last 8 years immediately prior to retirement. The monthly pension P_t is calculated as a fraction α_n (the replacement rate) of a benefit base B_t :

$$P_t = \alpha_n B_t.$$

The benefit base is calculated as a weighted average of monthly earnings W over a period consisting of the last 8 years prior to retirement according to the formula

$$B_t = \frac{1}{112}\left(\sum_{j=1}^{24} W_{t-j} + \sum_{j=25}^{96} \frac{I_{t-25}}{I_{t-j}}\right),$$

where I_{t-j} is the consumer price index for the j'th month before retirement. The reason for the division by 112 (and not by 96) is that pensions are paid out - like earnings - in fourteen monthly installments [11]. The replacement rate α_n depends on the number of

[9] Figure 8.12 in BJP which shows the distribution of affiliation to social security by program in the period 1982-96.

[10] p. 319 in BJP; these are 1996 numbers.

[11] p. 323 in BJP.

years of contributions, n, to the system. And as mentioned earlier, there is a penalty for retiring early. Let α_n^{65+} denote the replacement rate for a person aged 65 or above, then

$$\alpha_n^{65+} = \begin{cases} 0 & n < 15 \\ .6 + .02(n-15) & 15 \leq n < 35 \\ 1 & n \geq 35 \end{cases}$$

We immediately observe that a person aged 65 who has contributed to the system for 35 years gains nothing in terms of replacement rate by continuing to work beyond 65; if the person has contributed for less than 35 years, the gain from each extra year of work is a 2 percentage points increase in the replacement rate.

For a person aged 60 - 64, who has contributed to the system for n years, the replacement rate is reduced by 8 percent of α_n^{65+} for each year under 65 the person retires. Precisely, for a person aged j years under 65, the replacement rate α_n^j is given by the formula

$$\alpha_n^j = \alpha_n^{65+} - j \cdot 0.08 \cdot \alpha_n^{65+} = (1 - \alpha_n^{65+}) \cdot j \cdot 0.08, \qquad j = 1, 2, ..., 5$$

for all n.

Secondly, we describe the financing rules of the RESS program. It differs from the RGSS program in three main respects: (1) There is no early retirement option under the RESS program (2) self-employed are allowed to claim an Old age pension while still working as self-employed and (3) there are differences in the social security tax rate. The formula for calculating the pension is the same as under RGSS.

An important feature of both the RGSS and the RESS program is that it is the case that if the calculated pension P_t is below a minimum, then the person is paid a minimum pension. According to BJP, this creates strong early retirement motives for workers with short contribution histories in that these workers, even though they would be contributing for more years, will never reach a replacement rate that will get them over the minimum pension threshold level. The minimum pension is higher if the husband has a dependent spouse. And for all pensions it is the case that a pensioner receives a fixed annual allowance for each dependent child under 18 years of age [12].

Thirdly, we describe the financing rules of the RCP program. The pension under the RCP is also calculated as $P_t = \alpha_n B_t$, but both the benefit base and the replacement rate is calculated differently than under the RGSS and the RESS programs, and especially the formula for calculating the replacement rate has varied so frequently during the sample period that it is difficult to get a unified picture of the pension calculation. We therefore

[12] In 1996, this fixed annual allowance was 408.840 pesetas; BJP p. 327.

restrict our description of the RCP to listing the other important differences to the RGSS and RESS programs: (1) retirement is mandatory at 65 (2) there is an early retirement option in the RCP which allows civil servants with at least 30 years of service to retire from age 60 *without* being penalized (3) the RCP allows for limited possibilities of continuing to work in the public sector after retirement as long as the income does not constitute a "regular flow of income".

Returning to the issue of early retirement, it is now clear that there are good opportunities for early retirement with a fairly high replacement rate in Spain in the period 1985-97. In fact, as shown by various simulations in BJP [13], retiring as early as possible is actually optimal for workers in the lower end of the earnings distribution and/or with less than the maximum years of contributions. This is mainly due to the minimum pension effect and Spain has seen "a rapid increase in the number of retirees with short contribution histories receiving the minimum pension" [14].

3 Data

The data we use in this paper is the ECPF. The definitions of variables recorded in the ECPF can be found in Appendix A. The ECPF is a rotating panel with households staying in the survey between five and eight quarters. The ECPF has information on expenditures for 25 different commodity groups, representing a full range of commodities, information on several income categories as well as information on labor market status and occupation of both the husband and the wife [15].

Since we will select different samples for the cohort analysis and individual level analysis, we will provide the relevant descriptions for those samples in turn. For now, we only want to make three remarks about the data that are relevant for both the cohort description and for the individual level analysis.

The first remark is on a special feature of the Spanish payment system: A majority of Spanish full-time workers receive extra payments twice a year (usually in June-July and December-January). Following Browning and Collado (2001) we will refer to this payment structure as "the bonus scheme". According to Pou and Alegre (2003) this bonus scheme is also applied for pension payments[16]. The bonus scheme results in large, but anticipated, fluctuations of payments across the year[17]. This means that comparing incomes (earnings

[13] See especially Table 8.10 p. 342.

[14] BJP p. 347.

[15] All information is self-reported.

[16] Pou and Alegre (2003) p. 5.

[17] Browning and Collado (2001) present evidence that the Spanish households smooth these anticipated

and pensions) across quarters may give a scewed picture of disposable incomes.

The second remark is that even though there is no direct information in the ECPF about which pension program a given retiree belongs to, we can still infer this for the ones that are employed prior to retirement: From their occupational status we can infer which program they must belong to. For example, we know if a person is self-employed and thus belongs to the RESS program and is thus allowed to work as a self-employed also after retirement. In other words, we can be quite confident that it is not an error in the data when a person, who was self-employed prior to retirement, reports both pension income and self-employed income after retirement. To take another example, then we see a fair amount of early retirement in the ECPF. Recall that under the RGSS program it is allowed to retire from age 60 if you became affiliated with the pension system before 1967. Since our sample starts in 1985, it is highly unlikely that the people we see moving into retirement at age 60 or above were *not* affiliated with the system before 1967. Of course, we do not know for sure if a person belongs to the RGSS program. But it does for example seem likely that a person with low education level working as an unspecialized worker prior to retirement belongs to the RGSS program and thus has the early retirement option. As shown in the data chapter, the vast majority of the men in the ECPF has low education levels, and the fraction working as unspecialized workers is high. Moreover, the RCP program has the possibility of retiring early without even being penalized. Thus, it seems plausible (and from age 60, definite) that the early retirement we see in the ECPF is in full compliance with the pension laws.

The third remark is on the survey design of the ECPF. We describe the survey design in detail in Appendix A. The issue is that the information on the different variables reorded in a given quarter refers to different time periods: Labor market status recorded in a given quarter refers to *current* labor force status, whereas the income information in the same quarter refers to the three *calendar* months prior to the interview. The expenditure information on non-durables refers to the same period as the information on labor market status, whereas the expenditure information on durables refers to the *three months* prior to the interview. This means, firstly, that a household can report positive earnings in the same quarter as it reports to be retired, and that this is no mistake, and secondly, that it is difficult to place the expenditures on durables relative to the retirement threshold.

4 Cohort Analysis

Because data sets on household expenditures are usually cross sectional, the standard method for investigating consumption around retirement is to construct a quasi-panel

changes in earnings across the year in expenditures.

(or a pseudo-panel) of date-of-birth cohorts which enables us to follow these "pseudo-individuals" over time. In order to be able to compare our data with the findings of other studies, we first carry out a cohort level analysis of the data. Another reason for analysing the data at the cohort level is that we only observe our households for 5-8 quarters, so at the maximum we can observe a retiring household one year before and one year after retirement in which case we can take account of seasonal variations, but some households we may only observe for, say, two quarters after retirement. This means that the picture we get of their incomes and spending around retirement could be noisy. But if we see the same general picture at the cohort level as at the individual level, we can be more confident that it is not due to noise.

We construct date-of-birth cohorts according to the husband's date of birth. We define the cohorts according to the husband because 70% of the wifes work as housewifes and thus do not earn income prior to retirement. We divide households into groups according to the husband's date of birth and construct a time series for a given date-of-birth cohort of a given variable by taking means of that variable within each time period. In order to limit the dispersion of age within each cell we use five-year date-of-birth bands. We take yearly means. Since the data is quarterly covering the years 1985(I) - 1997(I), we get a time series of 13 "observations" for each cohort. We could also have chosen to take quarterly means, which would have resulted in a time series of 49 "observations". The main reason for looking at yearly means is "the bonus scheme" structure of earnings and pensions, which obviously results in payments being very unequal across the year. This means that age profiles with quarterly means could be quite noisy. Browning and Collado (2001) present evidence that the Spanish households smooth these anticipated changes in income across the year in expenditures. A second reason for using yearly instead of quarterly means is to get cell sizes large enough. We consider seven date-of-birth cohorts as defined in the table below:

	Date of birth	Age in 1985	Age in 1997
Cohort1	1951-55	30-34	42-46
Cohort2	1946-50	35-39	47-51
Cohort3	1941-45	40-44	52-56
Cohort4	1936-40	45-49	57-61
Cohort5	1931-35	50-54	62-66
Cohort6	1926-30	55-59	67-71
Cohort7	1921-25	60-64	72-76

The size of each cohort in terms of total number of observations is:

Cohort	1921-25	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55
Number of observations	7623	9785	10 946	9490	10 535	10 329	9704

The next table shows the number of observations in each cohort by year in the time series of yearly means[18]:

	1921-25	1926-30	1931-35	1936-40	1941-45	1946-50	1951-55
1985	572	677	739	698	783	697	580
1986	601	707	790	670	771	714	633
1987	799	865	986	895	874	902	714
1988	797	845	1038	874	926	882	784
1989	750	863	945	780	929	858	896
1990	693	930	909	868	903	963	862
1991	634	906	947	828	956	924	770
1992	614	908	932	785	906	861	863
1993	535	921	917	778	809	880	983
1994	549	876	955	791	855	930	914
1995	599	746	945	759	946	900	871
1996	424	474	729	661	771	713	722
1997	56	67	114	103	106	105	112
Total	7623	9785	10946	9490	10535	10329	9704

In defining employement rates, we follow Banks et al. and define the husband to be in employment if he is either full-time or part-time employed and to be out of employment if he is unemployed or retired or reports other type of employment (which could be military service or unpaid work).

The graphs of employment rates for the seven different cohorts are shown in Figure 1 and 2 in Appendix. Employment rates are around 90 percent for the 30-40 year old, and then at age 50 the employment rate starts dropping: For all three cohorts we follow as 50-60 year olds, employment falls to around 50 percent at age 60. Then again from age 60-65 there is a steady steep decline to less than 10 percent. At age 70 it seems that everybody is retired. The graphs of employment rates show a picture which is similar to the graph of labor force participation of men by age group in BJP from the 1993-95 EPA

[18]The reason for the relatively small cell sizes for 1997 is that we only have information for the first quarter of 1997 in our data.

cross section, which again is consistent with the 1990-91 EPF cross section[19].

We consider the four following income categories:

Income Category	**Definition**
Husband's earnings	Husband's earnings
Husband's pension	Husband's pension
Household earnings	Husband's earnings + Wife's earnings + Earnings of cohabiting adults
Total household income	Household earnings + Household self-employed income + Household income in kind + Household public transfers [20]+ Household other income [21]

As our consumption measure we consider total expenditures on non-durables. Under the assumption of separability in preferences between durables and non-durables, total non-durable expenditure is the relevant measure to use for consumption. The non-durables in our data are listed below:

Total expenditures on non-durables	Food and non-alcohol drinks consumed at home, Alcohol, Tobacco, Clothing, Energy at home, Services at home, Non-durables at home, Non-durable medicines, Medical services, Transport, Petrol, Leisure, Education, Personal services, Personal non-durables, Food in restaurants and bars, Holidays

Another reason for considering only the non-durables, is the timing in the expenditure information in the ECPF which makes it hard to time the purchases of durables in relation to the retirement.

All incomes and expenditures are deflated with an overall price index reported in the ECPF. Base year is 1992[22]. For the purpose of comparing income and expenditure we

[19] Figure 8.7.

[20] Pensions + Unemployment benefits.

[21] Capital income + Regular gifts.

[22] The values of this overall price index were very similar to the values of the Stone price indeces calculated for different classifications of total non-durable expenditures.

choose total household income as the relevant income measure, since all expenditures are recorded at the household level only.

We graph total household income, household earnings, husband's earnings and total non-durable expenditures for the seven cohorts in Figure 3 and 4. The upper line in the figures is total household income, the second line from above is total non-durable expenditures, the third line from above is household earnings and the lower line is husband's earnings. The overall picture is that husband's earnings and household earnings start decreasing around age 60 and decrease steadily after that. In the oldest cohort (cohort 7), husband's earnings reach zero around age 65, which is the official retirement age. The remarkable observation from these graphs is that total household income and total non-durable expenditures seem very flat across the ages where employment rates drop drastically. The conclusion we draw from this is that there does *not* seem to be any significant drops in total household incomes and total non-durable expenditures at retirement in these data.

To make the picture clearer we do two things. Firstly, we decompose total non-durable expenditures into cohort, age and time effects following Deaton and Paxson (1994), that is, we regress log total non-durable expenditure on normalised matrices of age dummies, cohort dummies and year dummies. The chosen normalisation for the cohort and age dummies are to leave out the cohort effect for cohort 1 and to leave out the five age effects for ages 32-36 incl.[23] The chosen normalisation for the year dummies is to make them orthogonal to a time trend. This is accomplished by excluding the two first year dummies D_1 and D_2 from the regression and then constructing a new matrix of time dummies where the rows in each column sum to zero, that is, the normalised year dummies D_t^* for time $t = 3, ...T$ are given as

$$D_t^* = D_t - ((t-1) D_1 - (t-2) D_2).$$

The estimated cohort effects are graphed in Figure 5, the estimated year effects in Figure 6 and the estimated age effects in Figure 7. Now it seems that (Figure 7) that total non-durable expenditure does actually fall when employement rates fall. Ths fall could however be due to a fall in household size (children moving out of the household). As Figure 8 shows, household size does indeed fall. We therefore equivalize total non-durable expenditure and repeat the decomposed cohort analysis (Figure 9, 10 and 11)[24]. Figure 11 now clearly shows that when controlling for demographics, then thre is no effect from age in total non-durable expenditure - from around age 57 total non-durable expenditure is completely flat (except for the spke from age 72 which is purely spurious).

[23] Since we only have one observation per age group in that "end" of the time series, we can not identify the first five age effects (five because we have five year bands).

[24] We use the OECD scale, which is given as $\frac{1}{1+0.6(\text{number of adults-1})+0.4(\text{number of children})}$

From this analysis of date-of-birth cohorts we thus conclude that both total household income and total non-durable expenditure seem to be relatively flat across the retirement threshold.

5 Individual Level Analysis

We now turn to exploiting the panel structure of the data. In this section we select a sample of households we can follow through retirement and compare their incomes, total non-durable expenditures and demand patterns before and after retirement.

5.1 Sample Selection

In this section we describe how we select our sample. Since the wifes work as housewifes for nearly 70% of the sample, we choose to focus on the retirement patterns of the husbands. So, we define a household to be retired according to whether the husband is retired. The information we have in the ECPF about whether a person is retired is self-reported labor market status as "retired". As we will show later, this seems to be an accurate measure of whether a person is retired.

Among the husbands there is a total of 661 transitions from nonretired status to retired status and a total of 267 transitions from retired status to nonretired status. However, a number of households have several transitions in and out of retirement. Some households have two transitions into retirement and one even has three. The table below shows the distribution of different transitions in and out of retirement taking place in the data:

Transition	Number of households
in the labor force, 0 transitions	9072
always retired, 0 transitions	3320
out of the labor force, 0 transitions	10
1 transition into retirement	433
1 transition out	56
1 transition into retirement, 1 out	125
2 transition into retirement, 1 out	27
1 transition into retirement, 2 out	10
2 transition into retirement, 2 out	17
3 transition into retirement, 2 out	1
3 transition into retirement, 3 out	1
Total	13.072

This table shows that 9072 households are in the labor force and do not retire, 3320 households are retired throughout the survey period, 10 households report employment status as out of the labor force, 433 households report one transition into retirement, 56 households report 1 transition out of retirement, 125 households report first one transition into retirement and then later in the survey period they report to leave retirement, 27 households report to retire, then to leave retirement and finally to retire again and so on. We select the households for which there is only one transition into retirement and where the husband remains retired for the rest of the survey period. This corresponds to the category "1 transition into retirement" in the table above and leaves us with 433 households.

Because we want to investigate demand patterns around retirement, a household is only useful for our purpose if we observe it both before and after retirement. In other words, we can only use the households for which retirement takes place between the second period and the last but one period the household is in the survey. We therefore select the households that are observed for at least one quarter before or one quarter after retirement. None of the households report to retire in the first interview, but 83 retire in their last interview. We delete those 83, which leaves us with 350 households. 10 of these households report an age pattern of the husband which can not be true (more specifically, for these 10 households the age of the husband changes with more than 0 or 1 year between two quarters - for some of the households it seems that what happens is that a younger person takes over as head of the household). Since it is not clear what is going on in these 10 households, we delete them, which leaves us with 340 households.

As mentioned in Section 2, the official retirement age in Spain is 65, but there is a fair amount of early retirement taking place in Spain during the years in which our data is collected. This also shows in our data. The table below shows the distribution of the age of the husbands at retirement:

Age	Number of households	Percent	Cumulative
30-39	5	1.47	1.47
40-49	16	4.71	6.18
50-54	27	7.94	14.12
55-59	63	18.53	32.65
60	38	11.18	43.83
61	25	7.35	51.18
62	27	7.94	59.12
63	17	5.00	64.12
64	30	8.82	72.94
65	78	22.95	95.89
66	7	2.06	97.95
67	3	0.88	98.83
68	2	0.59	99.42
69	1	0.29	99.71
70	1	0.29	100
Total	340	100	

This means that 5 households retire at the age of 30-39, 16 households retire at the age of 40-49 and so on. The same information in a more compressed table is given below:

Age	Number of households
30-59	111
60-64	137
65 +	92
Total	340

As explained in Section 2, it can be perfectly rational for a person to choose early retirement. It thus does not have to be the case that early retirement is a result of for example unexpectedly becoming unemployed and then giving up finding a job and then choosing to retire instead. We investigate the employment patterns of the husbands prior to retirement. If the vast majority of early retirements follow a spell of unemployment or unstable working history, we may be suspicious that early retirement is not really as much a choice as something individuals are forced into because of bad shocks. In the table below we record the fraction of of households where the husband is either full time employed in all periods prior to retirement, unemployed in all periods prior to retirement or switching between different employment states prior to retirement by age group. The way to read this table is that in the age group 30-39, 40 percent retire from full-time employment, 40 percent from unemployment and 20 percent switch between different employment states

prior to retiring:

Age	Percent of age group retiring from full-time work	Percent of age group retiring from unemployment	Percent of age group retiring from other [25]	Number of house-holds in age group
30-39	40	40	20	5
40-49	56	6	31	16
50-54	52	26	15	27
55-59	54	27	8	63
60	47	40	13	38
61	44	24	16	25
62	41	41	19	27
63	65	24	6	17
64	67	23	6	30
65	78	15	5	78
66	100	0	0	7
67	67	0	0	3
68	100	0	0	2
69	0	0	0	1
70	100	0	0	1

In each age group under age 65, roughly as many retire from a stable full-time employment history as from unstable ones or from unemployment. This suggests that also in our sample early retirement is not necessarily a result of bad shocks.

We select out people retiring before age 60. The reason for this is that we have found no description of early retirement options for people under 60, whereas both opportunities and incentives for retiring from age 60 are plenty. It thus seems more likely that the ones aged 60 and above could have anticipated to retire at the time they do it; firstly simply because the early retirement option is not available before age 60 and secondly, because the rules for calculating pensions are quite transparent, so it seems likely that people can predict their pensions reasonably well and then act according to that.

Finally, we delete 18 more households because they exhibit incomprehensible income patterns (for example reporting to receive pension while working, reporting only having capital income etc). The entire sample selection is illustrated in the table below:

[25] Households in this group typically retire fom an unstable employment history, i.e. they report alternating between full-time or part-time jobs or alternating between being employed and being unemployed.

Selection criteria	Number of households left in the sample
Retire (1 transition into retirement and stay retired for the survey period)	433
Observed at least 1 quarter before and after retirement	350
Husband's age pattern correct	340
Retire at 60 or above	229
Income patterns are "reasonable"	209

This leaves us with a sample of 209 households and 1529 observations. The distribution of households according to number of quarters they are in the sample is given below:

Number of quarters in sample	5	6	7	8	Total
Number of households	22	25	27	135	209

The distribution of households according to the retirement age of the husband shows that 59 percent of our sample retire early:

Retirement age	60	61	62	63	64	65+	Total
Number of households	38	21	27	13	25	85	209

Finally, we look at how the periods in which we observe a retiring household in our sample is distributed according to the retirement date. For this purpose, we construct a variable "Diff" which takes as values the number of quarters a given household is away from retirement, i.e. diff takes the value zero in the quarter in which the husband retires, negative values prior to retirement and positive values after retirement. To take an example, consider a household which is in the survey the first quarter of 1985 to the first quarter of 1986 and for which the husband retires in the fourth quarter 1986:

Year	Quarter	Employment status	Diff
1985	1	working full-time	-3
1985	2	working full-time	-2
1985	3	working full-time	-1
1985	4	retire	0
1986	1	retire	1

Since households are in the ECPF survey for between 5 and 8 quarters, and since we now have selected out the households that retire in the first or the last quarter they

are observed, we can maximum have observations on a household 6 quarters before *or* 6 quarters after retirement. The distribution of households according to the variable diff is tabulated below:

"Diff"	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	Total
Frequency	22	49	93	128	171	209	209	209	173	125	78	44	19	1529

Figure 13 and Figure 14 in Appendix show the averages of husband's earnings, respectively husband's pensions graphed according to the variable Diff for our selected sample. The figures show very clearly that the husbands in our sample have positive earnings prior to retirement and zero earnings after retirement and that the reverse is true for pensions: Pensions are zero prior to retirement and positive after retirement[26]. This shows that the self-reported measure if retirement in our data is accurate: Our selection on the basis of that measure really does pick up people that retire.

5.2 Pensions in the data compared to the minimum pension in Spain

As mentioned earlier, there is a fair amount of early retirement taking place in our sample. Indeed,early retirement was quite frequent in Spain during the sample period: In 1996, more than one third of those retiring under the RGSS retired early (BJP p. 324). We have a larger proportion than that retiring early in our sample, though. A reason for that could be that our sample contains many low earning households, and as shown in BJP, individuals in the lower end of the earnings distribution have stronger incentives to retire early, amongst other because of the minimum pension effect. We try to assess whether this could be the case in our sample by looking at the distribution of earnings and the distribution of pensions and comparing them to the minimum wages and minimum pensions in Spain during the sample period. The minimum wages and minimum pensions in Spain in the period 1985-96 are listed in Table 8.4 in BJP[27]. The annualized minimum wage is 520.380 in 1985 and increases steadily to 908.880 in 1996, the minimum pension when retiring at age less than 65 is 353.530 in 1985 and has increased to 770.350 in 1996

[26] There is a slight unprecision around the point of retirement in these figures, which is due to skewness in the timing of information about labor market status and incomes in the ECPF: Labor force status in a given quarter refers to current labor force status, whereas the income information in the same quarter refers to the three calendar months prior to the interview. However, when looking closely at each household in the sample, it becomes clear that some households report with more lag than three calendar months and some with less. We therefore chose not to "correct" the data, but simply accept that there is this unprecision in the income information in the two quarters surrounding the retirement date.

[27] All figures are in 1996 prices.

and the minimum pension when retiring at age 65 or above is 406.000 in 1985 and has increased to 880.180 in 1996.

In order to be able to compare our data with these numbers, we deflate all amounts such that they are in 1996 prices. We take earned income prior to retirement to be the sum of the husband's earnings and his self-employed income. Because of the fluctuations in payments across quarters, we take the average over quarterly earned income for each household and convert this into a yearly figure by multiplying it by four. We construct a yearly measure of pensions for each household in the same way. 161 households have a positive earned income before they retire (for the remaining households the husband is unemployed prior to retirement) and all 209 households have positive pensions after retirement. Graphs of these earnings and pensions are shown in Figure 15 and 16 in Appendix. For pensions, we have excluded the top ten percentile, and Figure 15 is thus based on 189 households. For earnings, we have excluded 4 households with earnings above 4 million pesetas per year. Since our panel is a rotating panel, we have households spread out over the whole sample period 1985-97 and we thus have relatively few households retiring in a given year. Therefore, we graph the distributions of earnings and pensions by households only and not by year as well. The graph of pensions should thus be compared to the "interval" 353.530 to 880.180 and the graph of earnings should be compared to the "interval" 520.380 to 908.880. Furthermore, the minimum pension can be even higher (in 1996, 1.200.000 pesetas) if the household contains dependent children under 18, since there is a fixed annual supplement per child. As can be seen, almost 40 percent of the households in the lower 90 percentile of the earnings distribution have earnings roughly around the minimum wage. And more than 40 percent of the households in our sample have pensions roughly around the minimum pension, which suggests that these households could have retired because of the minimum pension effect.

5.3 Income before and after Retirement: Replacement Ratios in the Data

Our cohort analysis showed that husband's earnings and the household's earnings decrease when the husbands start leaving the labor force, but that total household income does not fall. We now examine incomes before and after retirement at the individual level. Because we have defined retirement according to the husband, we focus on the husbands' incomes. As seen in Section 2, replacement rates in the Spanish pension system can be high and even equal to 1 (that is, that you get the full benefit base each month, corresponding to getting your average monthly salary over the last 8 years of working prior to retirement paid out each month). We can not calculate exactly the same replacement

rate in our data, because we do not have the individuals' earnings for the last 8 years prior to retirement. What we do instead to get an idea of how incomes vary across the retirement threshold at the individual level is to take the ratio of observed "income after retirement" to observed "income before retirement". We take the *average* over all quarters we observe the individual before retirement, respectively after, retirement, leaving out the quarter in which retirement takes place, as opposed to taking for example the first quarter we observe the individual as non-retired and the last quarter we observe him as retired because of the high seasonal fluctuations in the Spanish pension payments (recall that the Spanish pension system has the same payment structure as the Spanish salary system of the "bonus shceme" with fourteen payments instead of twelve). We consider the husband's income as well as total household income across the retirement threshold. More precisely, we define the husband's "income before retirement" to be the average of his earnings, his self-employed income and his unemployment benefit, and we define the husband's "income after retirement" to be the sum of husband's pensions and husband's self-employed income (remember that it is allowed to maintain self-employed income after retirement in Spain in the sample period). We thus leave out the quarter in which the husband retires, since it is not clear if the incomes reported in that quarter[28] belong to the time before or the time after retirement.

	"Income before retirement"	"Income after retirement"
r_1	Husband's earnings + husband's unemployment benefits + husband's self-employed income	Husband's pensions + husband's self-employed income
r_2	Husband's earnings + husband's unemployment benefits + husband's self-employed income	Husband's pensions

Let n_1 denote the number of quarters we observe a given household before retirement and let n_2 denote the number of quarters we observe the household after retirement, then we define the replacement ratios r_1 by

$$r_1 = \frac{I_+}{I_-},$$

[28] At "Diff"$= 0$.

where

$$I_- = \text{Income before retirement} = \frac{1}{n_1}\left(\begin{array}{c}\text{Husband's earnings +}\\ \text{husband's unemployment benefits +}\\ \text{husband's self-employed income}\end{array}\right)$$

$$I_+ = \text{Income after retirement} = \frac{1}{n_2}\left(\begin{array}{c}\text{Husband's pensions +}\\ \text{husband's self-employed income}\end{array}\right),$$

and r_2 accordingly. Thus a replacement ratio less than 1 means that the husband's income has dropped after retirement. Percentiles in the distribution of the two replacement ratios are listed below. The numbers in parentheses are percentiles when leaving out the top and bottom 1 percent of the distribution:

	25 percentile	50 percentile	Mean	75 percentile	Number of observations
r_1	.8109	1.0088	1.2955	1.3365	209
	(.8116)	(1.0088)	(1.1726)	(1.2962)	(205)
r_2	.7917	1.0011	1.2320	1.2502	209
	(.7923)	(1.0011)	(1.1363)	(1.2446)	(205)

It should be emphasized here, that these replacement ratios are not directly comparable to the replacement rates reported in the table of replacement rates in Section 2 (hence we chose the word "ratio" instead of "rate"), because we only observe our households in a smaller window around retirement. There are thus several reasons why a replacement ratio calculated from the data for a given household could differ from that household's replacement rate. For example, it could be that a person retires from a couple of years of unemployment. In that case the replacement ratio we calculate for such a person could be higher than that person 's replacement rate (because unemployment benefits, which is what we observe, most probably are lower than the person 's earnings which is what the benefit base would be based on). Another situation that would create a higher replacement ratio is if the person takes a pay cut or changes job and earns less in the years prior to retirement, where we observe him. This would make his earnings in the period we observe him less than his average earnings over the 8 year period on which his benefit base is based. Finally, a person could be receiving the minimum pension, in which case obviously the replacement ratio would be higher than the replacement rate.

5.4 Empirical Analysis

In this section we investigate if there are any significant effects of retirement on incomes, total non-durable expenditures or budget shares. For this purpose, we construct a dummy

variable for retirement, $D_{h,retire}$, which takes the value 0 before retirement and the value 1 after retirement. A positive effect of the retirement dummy $D_{h,retire}$ on a given variable thus means that this variable has increased after retirement.

The following two tables contain t-statistics for the coefficient on the dummy for retirement in regressions of deflated total household income and deflated total non-durable expenditures on the dummy for retirement. We focus on total household income because all expenditures are recorded at the household level, and total household income thus seems to be the relevant income measure. The line "no controls" are the results when including no other regressors than the dummy for retirement and a constant term. The line "quarterly and yearly dummies" are the results when also including quarter and year dummies. The rationale behind controlling for quarter and year effects is to control for the huge quarterly fluctuations in the payments of pensions (the "bonus scheme") and secondly to control for that we have a rotating panel, that is, to control for that a household retiring in 1986 could face a very different macro environment than a household retiring in, say, 1992. Including quarter and year dummies in the regressions of total nondurable expenditures does not change any of the results for total nondurable expenditure, and we therefore leave them out in the following. The results for total household income are displayed below:

t-statistics on $D_{h,\ retire}$	Pooled regression	Within groups regression	Random effects
Total household income in levels:			
No controls	-.68	.03	-.08
Quarterly and yearly dummies [29]	-1.06	-.36	-1.71
Total household income in logarithms:			
No controls	-.27	1.53	1.39
Quarterly and yearly dummies [30]	-.80	-1.11	-1.22

The results for total nondurable expenditure are:

[29] The Hausman test of random effects against fixed effects rejects the random effects model with a $\chi^2(16)$ test statistic of 60.53. Furthermore, the quarter and year dummies are significant: $F(13, 1304) = 2.01$.

[30] The Hausman test of random effects against fixed effects rejects the random effects model with a $\chi^2(16)$ test statistic of 24.52. Furthermore, the quarter and year dummies are significant:$F(13, 1304) = 2.37$.

***t*-statistics on $D_{h,\ retire}$**	Pooled regression	Within groups regression	Random effects
Total nondurable expenditure in levels:			
No controls	-1.58	-3.27	-3.17
Total nondurable expenditure in logarithms:			
No controls [31]	-1.27	-3.08	-3.02

The coefficients on the dummy for retirement, $D_{h,\ retire}$, in the regressions of total non-durable expenditures in logarithms are displayed in the table below. They show a significant drop of around 5 percent:

Estimated coefficient on $D_{h,\ retire}$ for total non-durable expenditure	Pooled regression	Within groups regression	Random effects
No controls	-.0366	-.0547	-.0533

The evidence on what happens to consumption across the retirement threshold is thus mixed: The pooled model gives as a result no effect of retirement, whereas the models taking account of unobservable heterogeneity both give as a result that total expenditure drops by around 5 percent. However, the table below shows that there is a substantial degree of cohabitation in the households in our sample:

[31] The Hausman test statistic for random effects against fixed effects give $\chi^2(1) = 0.49$, i.e. the random effects model can not be rejected.

Number of additional adults in household	Frequency	Percent
None	68	32.54
One or more	141	67.46
Total	209	100
Number of children in household		
None	173	82.78
One or more	36	17.22
Total	209	100

We therefore equivalize total nondurable expenditure by the OECD scale we also used in the cohort analysis and repeat the analysis on the equivalized data. Even though it is more obvious that expenditures should be equivalized than income should be, we also equivalize incomes for consistency. As is apparent from the table below, when taking account of demographics there is no effect from retirement on total expenditures. Further, when including quarterly and yearly dummies, there is still no effect from retirement on total household income:

***t*-statistics on** $D_{h,\ retire}$	Pooled regression	Within groups regression	Random effects
Total household income in levels:			
No controls	.95	1.20	1
Quarterly and yearly dummies [32]	.76	-.41	.18
Total household income in logarithms:			
No controls	1.46	2.86	2.81
Quarterly and yearly dummies [33]	1.30	-.56	1.07

[32]The Hausman test of random effects against fixed effects rejects the random effects model with a $\chi^2(16)$ test statistic of 24.52. Furthermore, the quarter and year dummies are significant:$F(13, 1304) = 2.37$.

[33]The Hausman test of random effects against fixed effects rejects the random effects model with a $\chi^2(16)$ test statistic of 24.52. Furthermore, the quarter and year dummies are significant:$F(13, 1304) = 2.37$.

When equivalizing total nondurable expenditure, there is no longer any effect of retirement:

***t*-statistics on $D_{h,\ retire}$**	Pooled regression	Within groups regression	Random effects
Total nondurable expenditure in levels:			
No controls	.50	-1.31	-1.15
Total nondurable expenditure in logarithms:			
No controls [34]	.80	-1.31	-1.18

The overall conclusion from these regressions of incomes is that there is no fall in total household income at retirement when controlling for seasonality and business cycle effects. This means that we in some sense have "the perfect experiment": We have selected a sample of people that retire. We believe we have justified that they really do retire, that the vast majority of our sample retires expectedly and even when taking account of unobservable heterogeneity we find no significant drop in income following retirement. This means that the effect of retirement on consumption we pick up is the effect of the husband not working anymore[35]. This finding justifies that it seems reasonable to attribute any effect of retirement on consumption to the increase in leisure time. In other words, the finding about no income drop disentangles the income effect from the effect of not going to work anymore. The finding for total expenditure is that there is no fall in total nondurable expenditures at retirement either, once demographics are controlled for. This was exactly the same we found in the cohort analysis (Figure 11).

Finally we turn to examining budget shares. Even though there is no drop in total expenditures at retirement, this does not imply that households do not allocate expenditure differently to the different commodities as a consequence of the increase in leisure time. We could this still see households substituting away from work-related goods, or engage in home production.

In order to examine budget shares, we estimate a Working-Leser demand system in its most simple version, including the dummy for retirement, $D_{h,retire}$:

$$w_{iht} = \alpha_i + \beta_i \ln x_{ht} + \delta_i D_{h,retire} + \gamma_i' Z_{ht} + \varepsilon_{iht},$$

[34] The Hausman test statistic for random effects against fixed effects give $\chi^2(1) = 0.49$, i.e. the random effects model can not be rejected.

[35] The majority of our sample (approximately 80 percent) retires from full-time work.

$i = 1, ..., N-1$, $h = 1, ..., H$, $t = 1, ..., T_h$, where $\ln x_{ht}$ is deflated with the Stone price index and where the vector of demographics Z_{ht} consists of number of children in household h at time t, number of cohabiting adults in household h at time t, a dummy variable for whether the wife in household h works or not at time t and quarterly as well as yearly dummies (that is, 15 seasonal dummies in total). The left out good is Personal Non-durables:

Commodity	Pooled OLS	First differences [36]	Within groups	Random effects [37]
Food at home	−.0026 (.0067)	−.0005 (.0128)	−.0015 (.0092)	.0016 (.0059)
Alcohol	−.0012 (.0020)	.0035 (.0033)	.0020 (.0024)	−.0002 (.0016)
Tobacco	.0002 (.0016)	.0005 (.0032)	.0007 (.0019)	−.0003 (.0013)
Clothing	−.0026 (.0059)	.0072 (.0119)	.0060 (.0094)	−.0002 (.0058)
Energy at home	−.0001 (.0020)	.0030 (.0050)	.0019 (.0031)	−.0010 (.0020)
Services at home	.0022 (.0014)	−.0010 (.0020)	.0020 (.0025)	.0022 (.0015)
Non-durables at home	−.0004 (.0014)	.0006 (.0026)	.0010 (.0020)	−.0010 (.0012)
Non-durable medicines	−.0057 (.0015)	−.0087 (.0033)	−.0076 (.0025)	−.0057 (.0015)
Medical services	−.0011 (.0029)	−.0072 (.0063)	−.0077 (.0048)	−.0012 (.0030)
Transportation	.0070 (.0048)	−.0020 (.0095)	−.0014 (.0076)	.0051 (.0047)
Petrol	−.0003 (.0030)	−.0048 (.0053)	−.0044 (.0038)	−.0036 (.0025)
Leisure	.0019 (.0017)	.0012 (.0032)	.0023 (.0025)	.0020 (.0017)
Education	−.0004 (.0019)	.0060 (.0028)	.0023 (.0025)	−.0000 (.0016)
Personal services	−.0020 (.0018)	−.0007 (.0044)	.0013 (.0029)	−.0010 (.0018)
Foodout	.0037 (.0048)	−.0059 (.0079)	−.0028 (.0063)	−.0005 (.0041)
Holidays	.0020 (.0018)	.0055 (.0045)	.0042 (.0030)	.0023 (.0018)

The next table reports the t-statistics for the estimated coefficients on the dummy for

[36] Standard errors are clustered by households.

[37] The Hausman test for random effects against fixed effects rejects the random effects model for the

retirement for four of the five estimators[38].

***t*-statistics on $D_{h,\ retire}$ in the demand system**	Pooled OLS	First differences [39]	Within groups	Random effects [40]
Food at home	-.38	-.04	-.17	.27
Alcohol	-.61	1.04	.85	-.10
Tobacco	.12	.14	.38	-.24
Clothing	-.44	.60	.63	-.04
Energy at home	-.09	.61	.61	-.51
Services at home	1.49	-.50	.77	1.44
Non-durables at home	-.30	.23	.48	-.74
Non-durable medicines	**-3.75**	**-2.62**	**-3.01**	**-3.78**
Medical services	-.38	-1.15	-1.60	-.41
Transportation	1.47	-.21	-.18	1.10
Petrol	-.10	-.91	-1.15	-1.45
Leisure	1.13	.39	.89	1.26
Education	-.21	**2.12**	.93	-.01
Personal services	-1.08	-.16	.45	-.55
Foodout	.77	-.74	-.44	-.12
Holidays	1.15	1.22	1.38	1.26

As can be seen from the table of t-statistics on the retirement dummy in the budget share system, retirement only has a significant effect on Non-durable medicines. The effect is negative, which means that the budget share for Non-durable medicines has *fallen* significantly after retirement, which is contrary to what we would have expected. The only interpretation of this result we could think of is that Non-durable medicines must be subsidized in Spain for retirees. Since there is a significant effect of retirement on one budget share it means that some combination of other budget shares must rise significantly because of adding up. We tried different combinations of goods, but found nothing convincing.

Finally, we turn to examining work-related expenditures. The first step is obviously to single out what goods could be work-related in Spain during this period. One example that is often mentioned in the literature is that of home production of food: Because leisure

following commodities: Non-durables at home, Transportation, Petrol, Leisure and Education.

[38]The results on the significance of the retirement dummy for the two stages least squares were the same as for the pooled OLS.

[39]Standard errors are clustered by households.

[40]The Hausman test for random effects against fixed effects rejects the random effects model for the following commodities: Non-durables at home, Transportation, Petrol, Leisure and Education.

time has increased at retirement there is now more time for food preparation, which implies that the demand in the Food at home - category shifts from from pre-prepared food to non-prepared food, which is cheaper. Thus, the budget share for Food at home should fall at retirement. But this example does not seem suitable for this particular data: It is the husband that retires, and most of the wives work as housewives, so it seems unlikely that the home-production of peeling carrots goes up because the husband retires. On the contrary, one could imagine that the budget share for Food at home might increase if the husband starts eating all his meals at home. We have not come up with any satisfactory classification of goods into work-related and non-work-related yet; the point we are trying to make here is merely that such a classification may require some extra thought for this data because of the household composition being very different from that of a British or American retiring household. Instead, we examined the budget share for exactly the same group of goods as Banks et al. classify as work-related, namely Clothing, Transportation, Petrol and Foodout. The results are in the table below. As can be seen, there is no significant effect on this supposedly work-related budget share either.

***t*-statistics on $D_{h,\ retire}$**	Pooled OLS	First differences [41]	Within groups	Random effects [42]
Work related goods: Clothing, Transportation, Petrol and Foodout	.98	-.60	-.23	.31

6 Conclusions and Further Work

This paper investigates how incomes, total non-durable expenditures and demands change around retirement, using a panel data set on household expenditures. We find that there are no significant changes in total household incomes at retirement, neither at the cohort level, nor at the individual level. Further, we find that there is no signifcant change in total non-durable expenditures at retirement either, neither at the cohort level, nor at the individual level. Our preliminary findings on demand are that there are no significant changes in budget shares around retirement[43], meaning that there are *no* non-separabilities between work and consumption. This is in sharp contrast to what other studies have found. But our sample differs from data used in these studies in that most other studies all report large drops in income at retirement whereas income does not drop

[41] Standard errors are clustered by households.

[42] The Hausman test for random effects against fixed effects strongly rejects the random effects model with a test statistic $\chi^2(20) = 13668$.

[43] Except for the budget share on medicines.

significantly at retirement in our sample. As we explained, this is very plausible since the Spanish pension system provides the possibility of having high replacement rates. This finding of no significant drop in income at retirement means that what we identify with this data is the pure impact of retirement on total expenditure and demands.

This paper is preliminary and one possibility we have not exploited yet is to split our sample by the replacement ratio in income, i.e. to divide the sample into those who experience a drop in income and those who do not, and then analyze demand changes in both groups. Splitting the sample by replacement ratio, however, would probably introduce endogeneity problems that would need to be dealt with. Some of the households in our sample retire from unemployment[44]. This means that their leisure time in principle does not change at retirement (we say in principle, because they may spend time looking for a job before they retire, and also in other respects is it likely that unemployment and retirement have different effects on the needs and preferences of the household). Therefore it could be an idea for further versions of the paper, in order to check the robustness of our results, to select out the households that retire from unemployment which should give a cleaner effect of retirement on demands for work-related goods. Finally, we also intend to complete the cohort level analysis with estimating an Euler equation.

A possibility for taking this paper further is to investigate whether it is possible to detect a group of households in the data for whom it seems likely that retirement is unanticipated. Hurd and Rohwedder (2003) combine data from the Health and Retirement Survey (HRS) with the Consumption and Activities Mail Survey (which is data on anticipated spending changes at retirement for a random sample of the HRS) and find that people do not experience unanticipated shocks at retirement; on the contrary it seems that consumption changes come as no surprise to most people. But "for a fraction of the population there may be a surprise. However, these speculations will require confirmation in panel data"[45]. Because we have panel data, we can more accurately assess whether retirement is anticipated or not, because we are able to follow the individual households as they retire. The most obvious candidate for a group experiencing unanticipated retirements is the 50-59 year olds. We could therefore investigate whether there are any effects from retirement on total expenditures and demands for this group. This would be along the lines of Smith (2004) who divides her sample into what can reasonably be classified as voluntary and involuntary retirements, thereby capturing whether retirement was anticipated or not.

[44] Out of the 340 retiring households, 82 retire from unemployment. In our selected sample of 209 households, approximately 25 percent retire from unemployment.

[45] Hurd and Rohwedder (2003), p. 17.

References

[1] Banks, J., R. Blundell and S. Tanner (1998): "Is there a Retirement-Savings Puzzle?", *American Economic Review*, Vol. 88, No. 4, 769-788.

[2] Bernheim, B. D., J. Skinner and S. Weinberg (2001): "What accounts for the Variation in Retirement Wealth Among U.S. Households?", *American Economic Review,* Vol. 91, No. 4, 832-857.

[3] Blau, D., (2004): "Retirement and Consumption in a Life Cycle Model", mimeo, University of North Carolina at Chapel Hill (www.unc.edu/depts/econ/profs/blau/blauweb.html)

[4] Boldrin, M. B., S. Jimenez-Martin and F. Peracchi (1999): "Social Security and Retirement in Spain", Social Security and Retirement around the World, National Bureau of Economic Research, eds. J. Gruber and D. A. Wise, 305-355.

[5] Browning, M., and M. D. Collado: "The Response of Expenditures to Anticipated Income Changes: Panel Data Estimates", *American Economic Review*, Vol. 91(3), 681-692.

[6] Browning, M., and T. Crossley (2001): "The Life-Cycle Model of Consumption and Saving", *Journal of Economic Perspectives*, Vol. 15, No. 3, 3-22.

[7] Deaton, A., (1997): "The Analysis of Household Surveys", The Johns Hopkins University Press.

[8] Deaton, A., and C. Paxson (2000): "Intertemporal Choice and Inequality", *Journal of Political Economy*, Vol. 102, No. 3, 437-467.

[9] Denton, F. T., D. C. Mountain and B. G. Spencer (2002): "Age, Retirement and Expenditure Patterns: An Econometric Study of Older Canadian Households", SEDAP Research Paper No. 82.

[10] Hurd, M., and S. Rohwedder (2003): "The Retirement-Consumption Puzzle: Anticipated and Actual Declines in Spending at Retirement", NBER Working Paper 9586.

[11] Miniaci, R., C. Monfardini and G. Weber (2003): "Is There a Retirement Consumption Puzzle in Italy?", IFS Working Paper W03/14.

[12] Pou, L., and J. Alegre (2003): "Further Evidence of Excess Sensitivity of Consumption: Non-separability among Goods and Heterogeneity across Households", mimeo, University of the Balearic Islands, Spain.

[13] Smith, S., (2004): "Can the Retirement Consumption Puzzle be Solved? Evidence from UK Panel Data", IFS Working paper W04/07.

A Appendix A: Variable Definitions

A.1 Consumption Expenditures in the ECPF

Variable name	Description
xfood	Food and non-alcoholic drinks at home
xalcohol	Alcoholic drinks
xtobac	Tobacco
xcloth	Clothing and footwear
xrents	House rent (includes Imputed rent, ykirent)
xserv3	Energy at home (heating by electricity)
xdur4	Durables at home (furniture, appliances)
xserv4	Services at home (heating which is not electricity, water, furniture repair)
xsdur4	Small durables at home
xndur4	Non-durables at home (cleaning products)
xdur5	Durable medicines (spectacles, wheelchairs, crutches)
xndur5	Nondurable medicines
xserv5	Medical services
xdur6	Cars
xserv6	Transportation
xgasol	Petrol
xdur7	Durables at home (tv & music)
xsdur7	Small durables (books, toys, CDs)
xserv7	Leisure (cinema, theatre, clubs for sports)
xeduc	Education
xserv8	Personal services
xndur8	Personal non-durables (soap, toothpaste)
xsdur8	Personal small durables (hair-dryer, shavors, coams, jewellery, lighters, suitcases)
xfoodout	Restaurants and bars
xholiday	Traveling

A.2 Income Categories in the ECPF

Variable name	Description
ykearn	Household level: Earned income in kind
ykse	Household level: Self-employed income in kind
ykirent	Household level: Imputed rent
ykother	Household level: Other income in kind
yearn	Household level: Earned income
yse	Household level: Self-employed income
ycap	Household level: Capital income
ypen	Household level: Pensions
yunemb	Household level: Unemployment benefit
yrgift	Household level: Regular gifts
yogift	Household level: Other gifts
hyearn	Husband: Earned income
hyse	Husband: Self-employed income
hycap	Husband: Capital income
hypen	Husband: Pension
hyunemb	Husband: Unemployment benefit
hyrgift	Husband: Regular gifts
hyogift	Husband: Other gifts
wyearn	Wife: Earned income
wyse	Wife: Self-employed income
wycap	Wife: Capital income
wypen	Wife: Pension
wyunemb	Wife: Unemployment benefit
wyrgift	Wife: Regular gifts
wyogift	Wife: Other gifts

A.3 Demographic Variables in the ECPF

Variable name	Definition
hage	Age of the husband
hempl: Husband's employment status	1: working full-time 2: working part-time 3: unemployed 4: retired 5: housewife 6: others
hgact: Husband's employment occupation	0: missing 1: entrepreneurs with wage earners as employees or self-employed with university degree working as lawyers 2: agricultural entrepreneurs without wage earners as employees 3: agricultural workers 4: non-agricultural entrepreneurs without employees and self-employed without university degree 5: wage earners with university degree 6: specialized workers without university degree 7: unspecialized workers
wage	Age of the wife
wempl: Wife's employment status	Same coding as Hempl
wgact: Wife's employment occupation	Same coding as Hgact
age02	Number of persons aged 0-2 years in the household
age36	Number of persons aged 3-6 years in the household
age713	Number of persons aged 7-13 years in the household
age1415	Number of persons aged 14-15 years in the household
age1617	Number of persons aged 16-17 years in the household
age1824	Number of persons aged 18-24 years in the household

age2564	Number of persons aged 24-65 years in the household
age65	Number of persons aged 65 years and above in the household
nmales	Number of males in the household
nfemales	Number of females in the household
tenure: Tenure of main house	1: home owner 2: free accomodation (get house from firm) 3: free accomodation (get house from somebody else, e.g parents) 4: pay small percentage (employer pays rest) 5: pay small percentage (somebody else than employer pays rest) 6: renters
heduc: Education level of the husband	1: illiterate 2: less than 5 years of school 3: primary school 4: secondary school, first level 5: secondary school, second level 6: university degree (3 years) 7: university degree (5 years) and PhD's
it	Nominel interest rate

B Appendix B: Figures

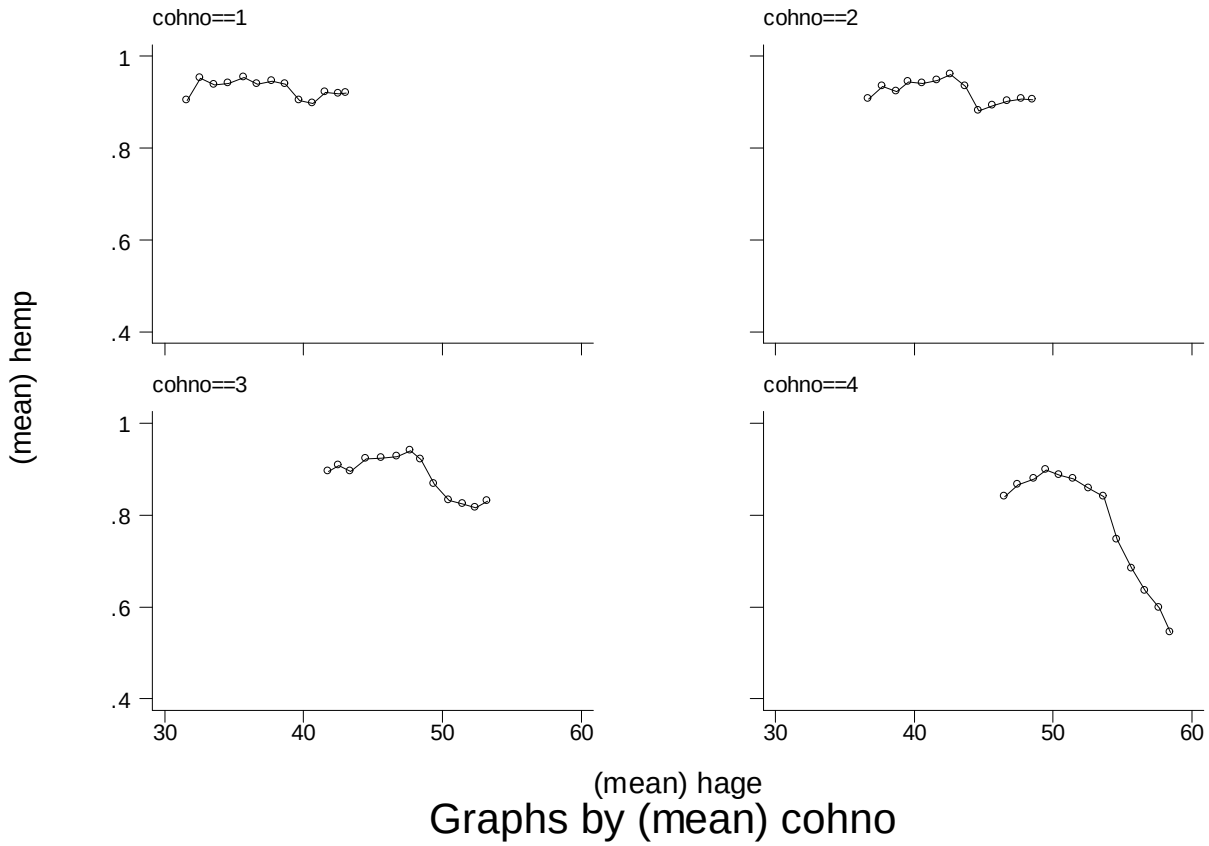

Figure 1: Employment rates by age for cohorts 1, 2, 3 and 4

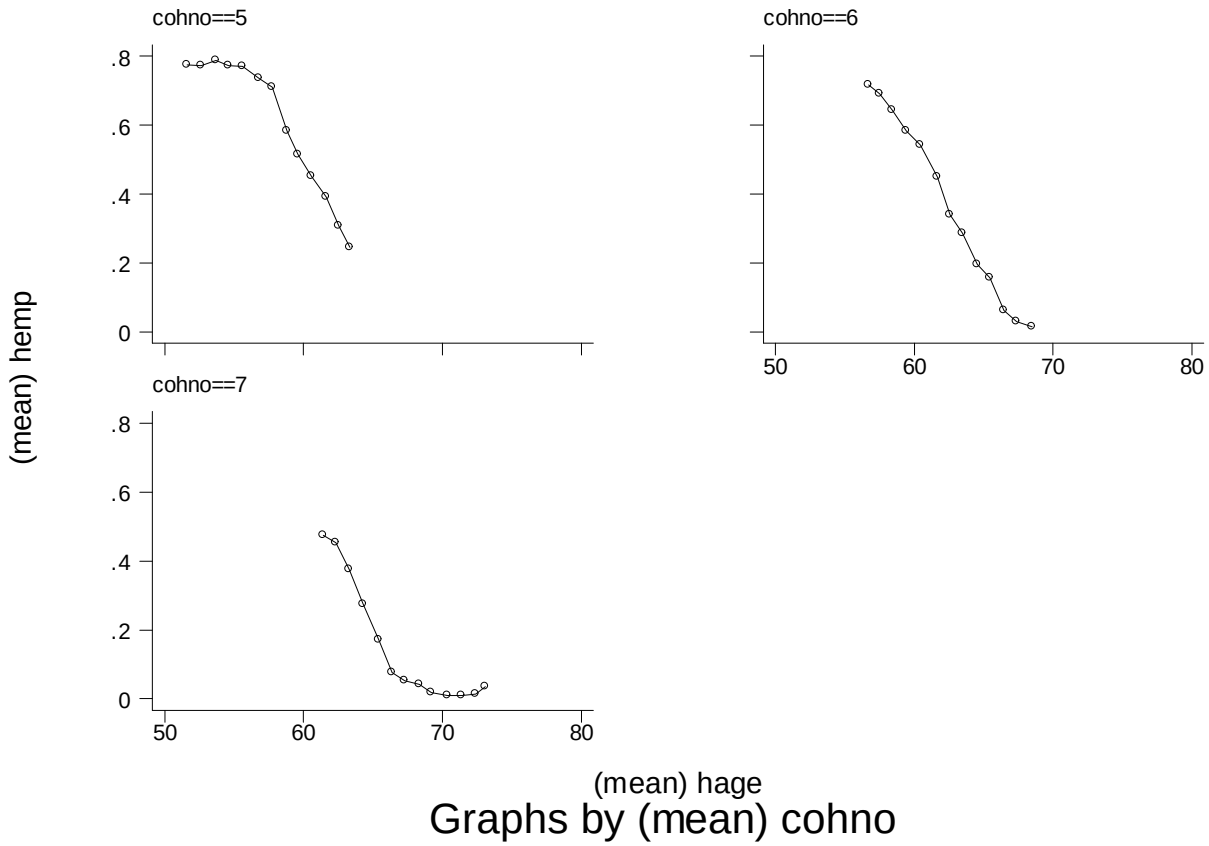

Figure 2: Employment rates by age for cohorts 5, 6 and 7

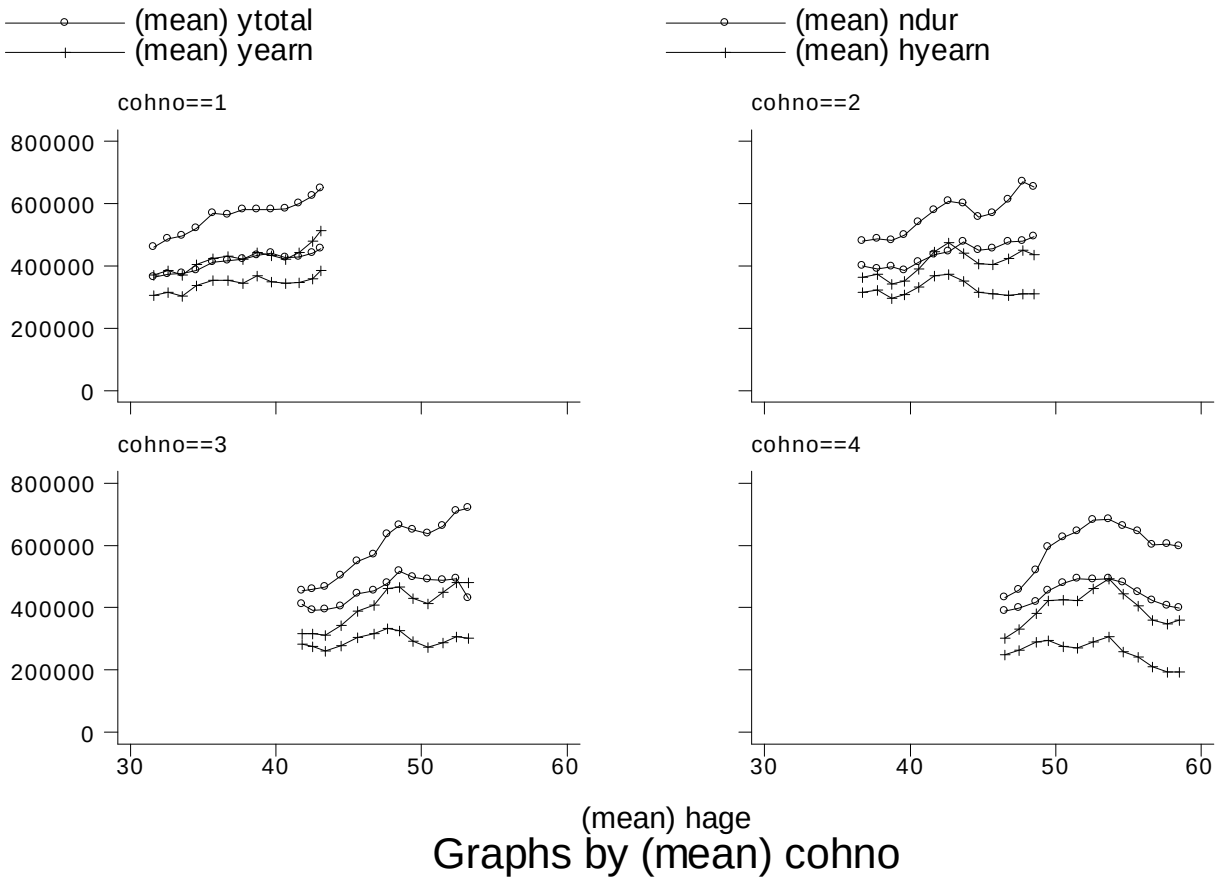

Figure 3: Total household income, total non-durable expenditures, total household earnings and husband's earnings for cohorts 1, 2, 3 and 4

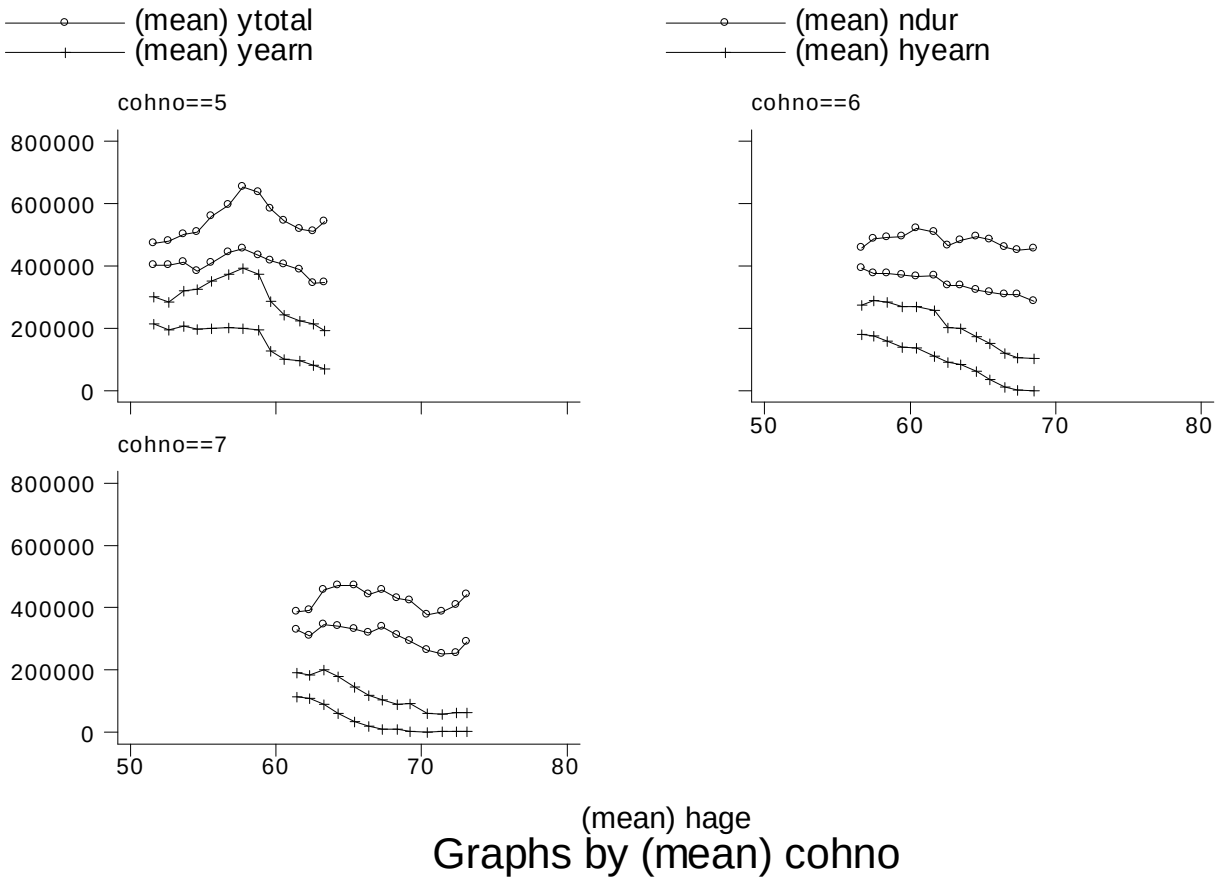

Figure 4: Total household income, total non-durable expenditures, total household earnings and husband's earnings for cohorts 5, 6 and 7

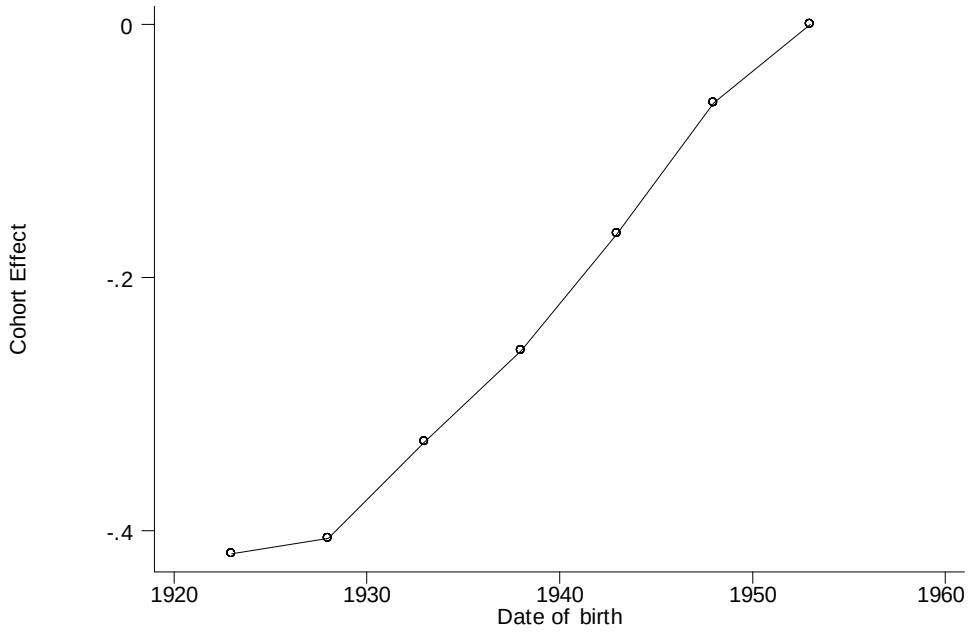

Figure 5: Cohort effects in log non-durable total expenditures

Figure 6: Year Effects in log non-durable total expenditures

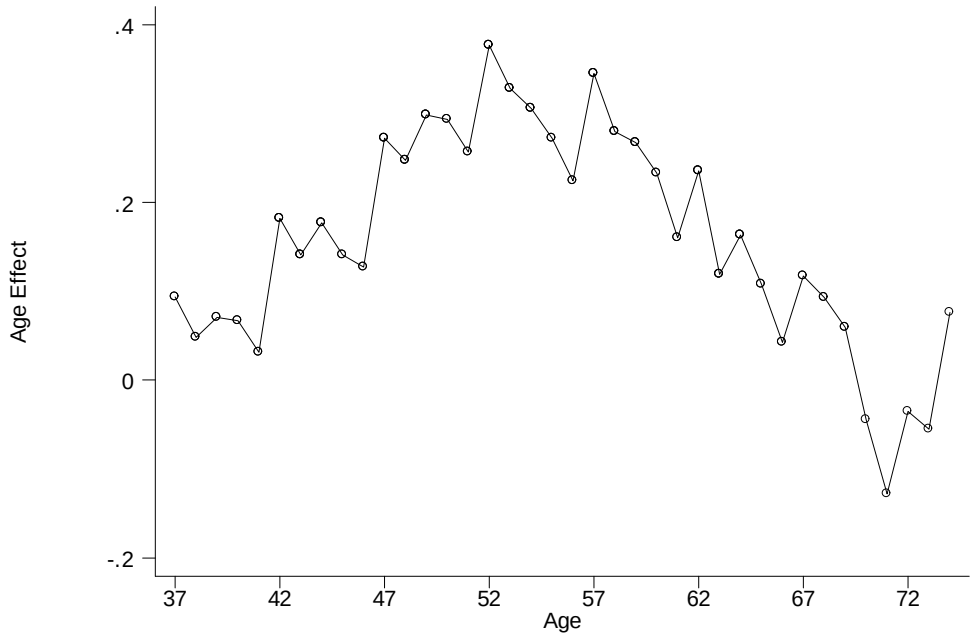

Figure 7: Age Effects in log non-durable total expenditures

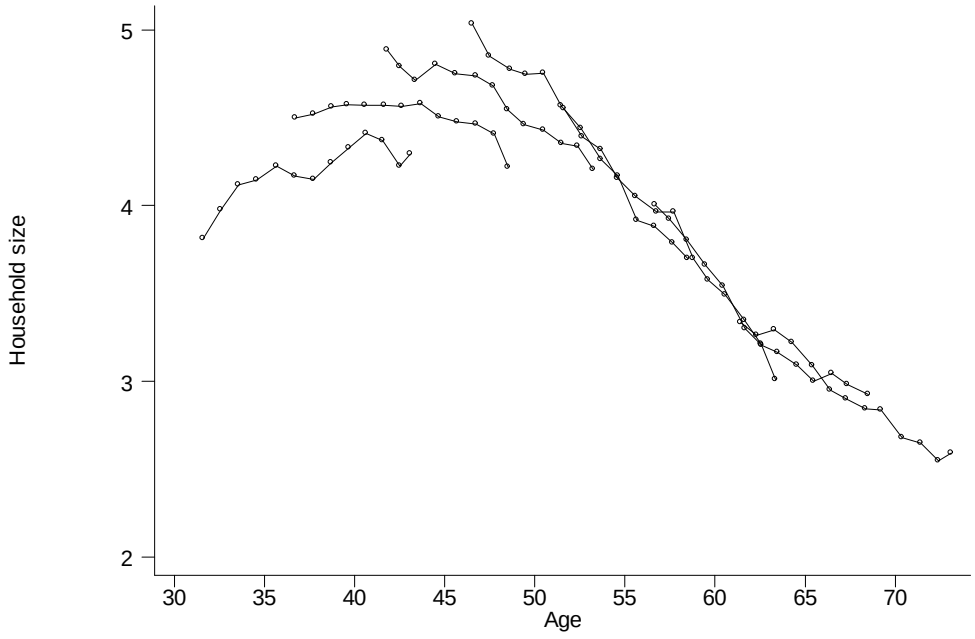

Figure 8: The evolution in household size by age for the different cohorts

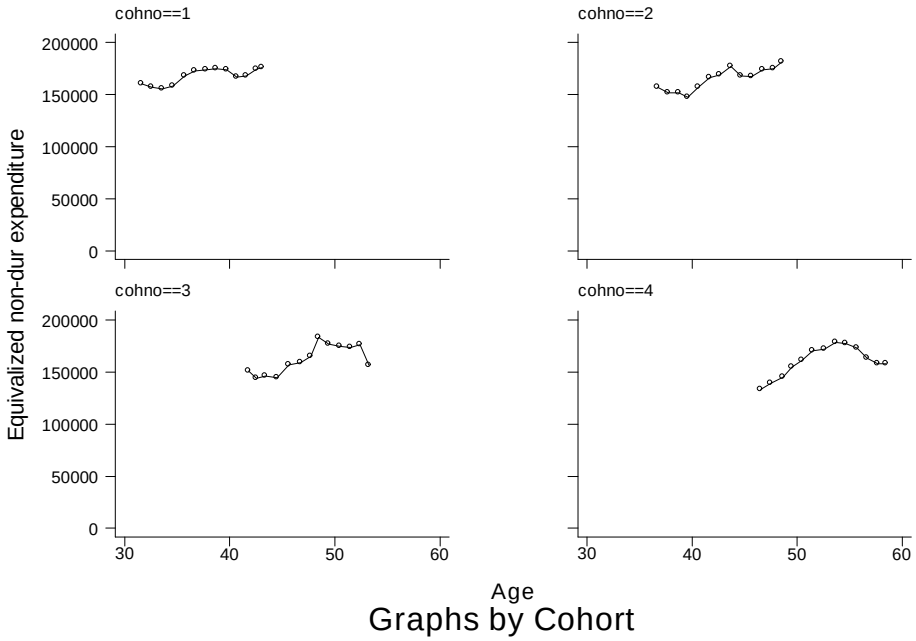

Figure 9: Total non-durable expenditure by cohort, controlling for demographics, cohorts 1, 2, 3 and 4

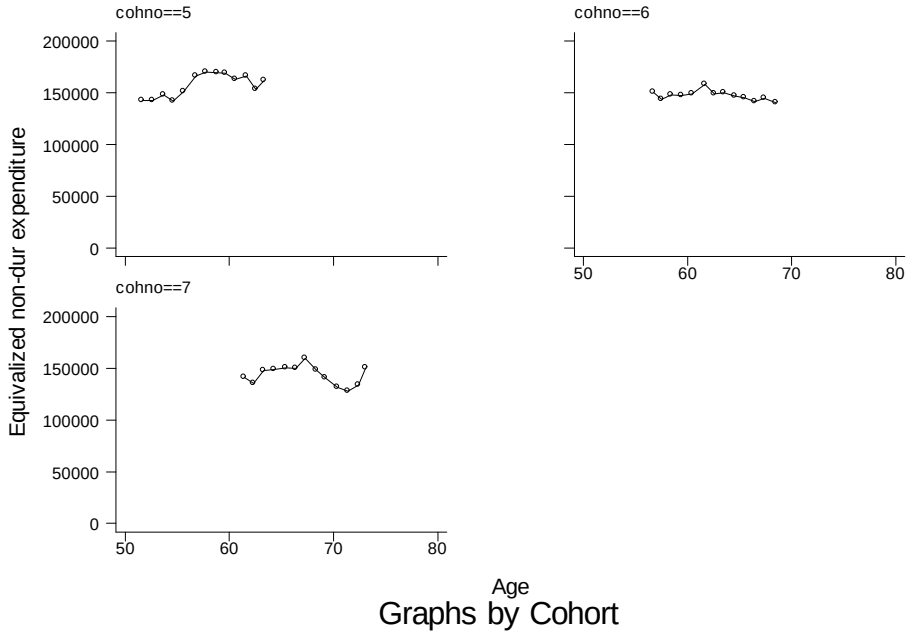

Figure 10: Total non-durable expenditure by cohort, controlling for demographics, cohorts 5, 6 and 7

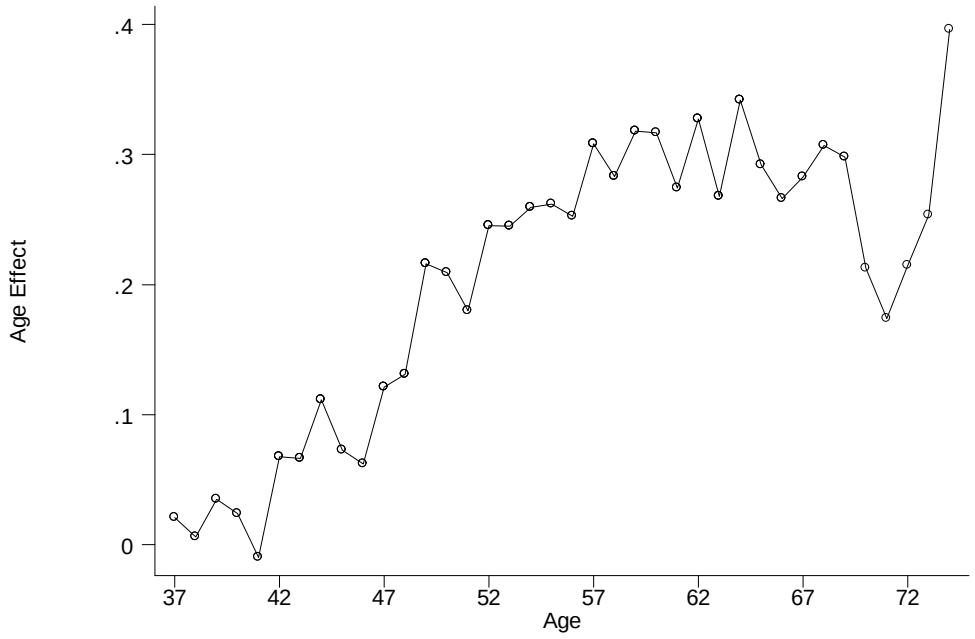

Figure 11: Age effects in log total non-durable expenditure, controlling for demographics

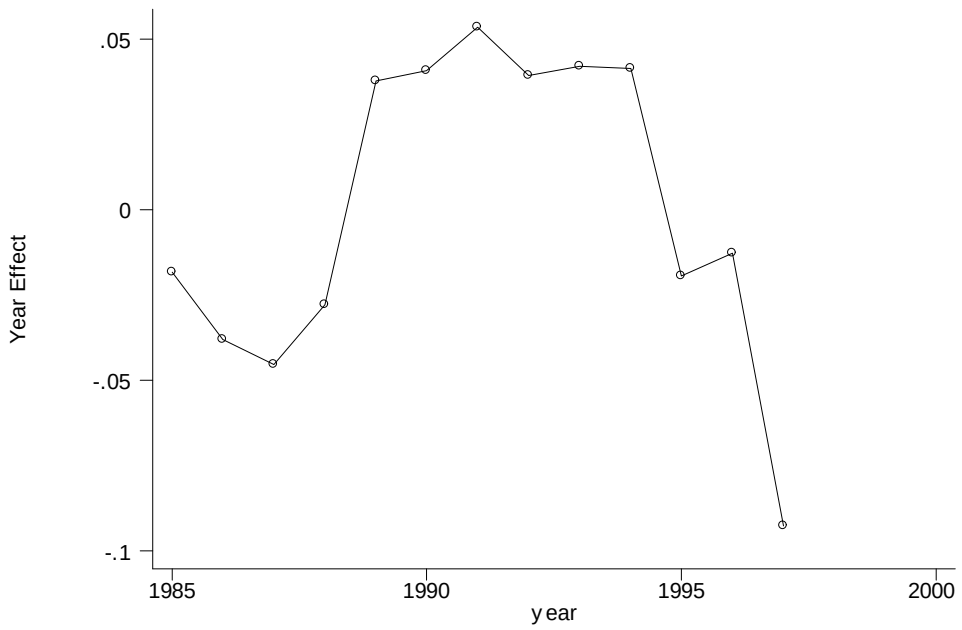

Figure 12: Year effects in log total non-durable expenditure, controlling for demographics

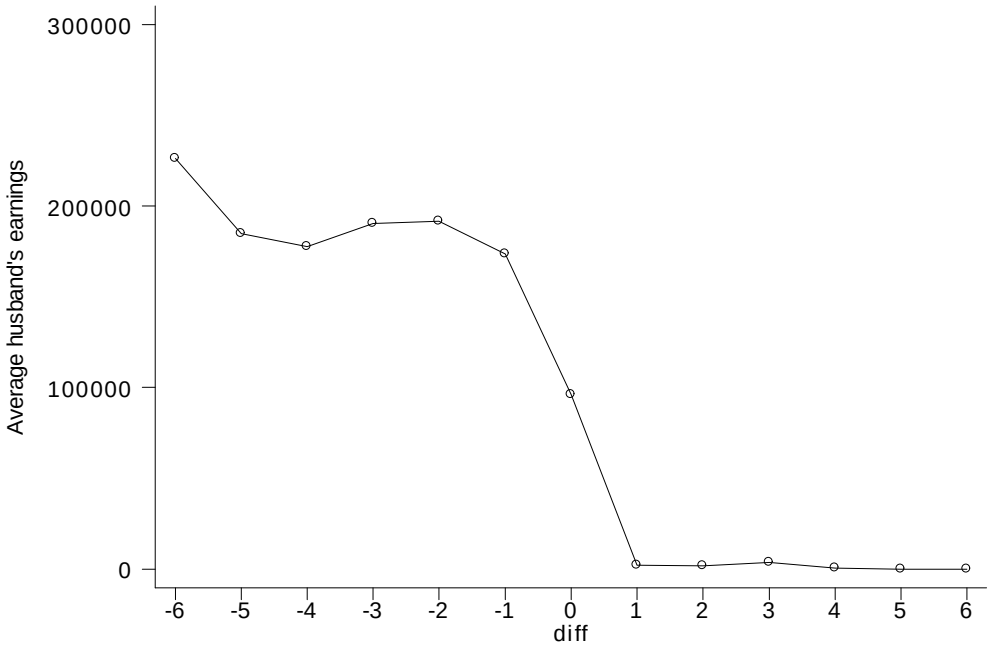

Figure 13: Husband's earnings across the retirement threshold

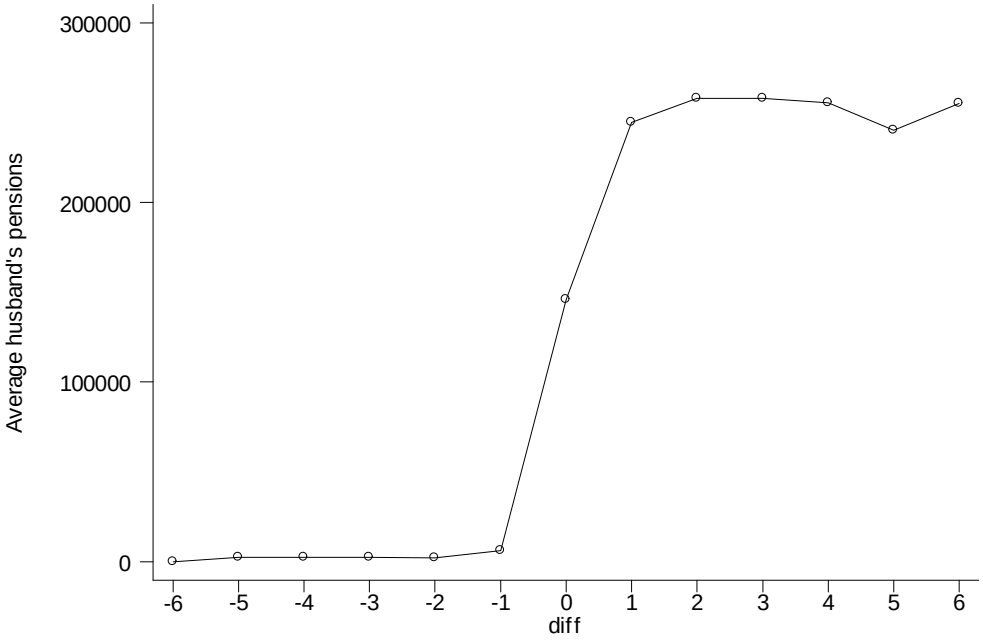

Figure 14: Husband's pensions across the retirement threshold

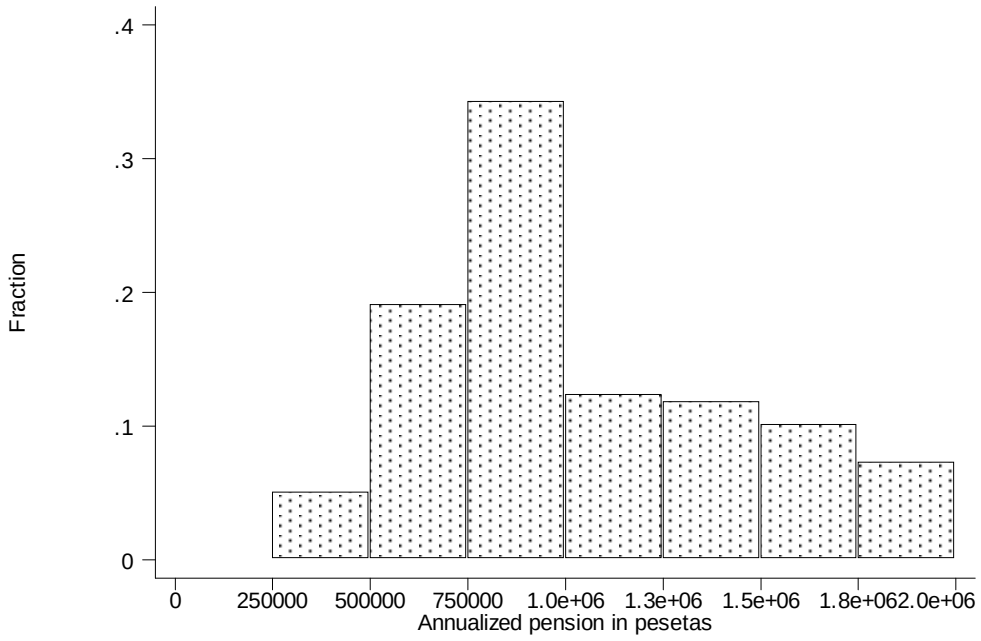

Figure 15: Distribution of husband's pensions in 1996 prices

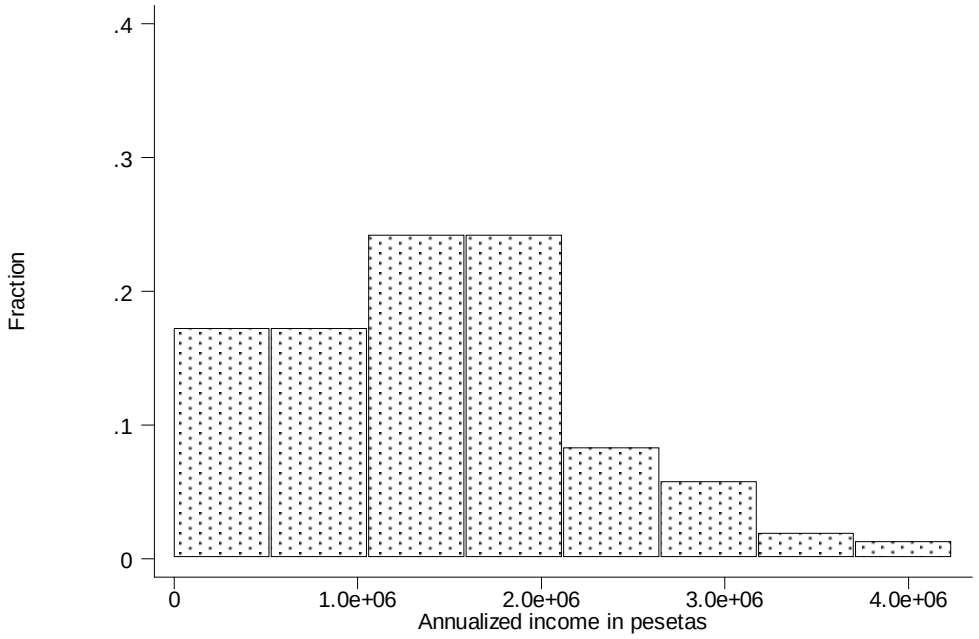

Figure 16: Distribution of husband's earnings in 1996 prices