

# **The Retirement-Consumption Puzzle: Actual Spending Change in Panel Data.**

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## Retirement-consumption puzzle

(Large) decline in spending at retirement

### Puzzle

In simplest model marginal utility of consumption should be continuous  $\Rightarrow$  consumption should be continuous.

## **But retirement is associated with a sudden:**

- Increase in available leisure time
- Increase in scope for home production
  - Substitution of work at home for purchased goods
  - More efficient shopping
- Increase in scope for spending that is complementary to time
  - Travel

If leisure and consumption (spending) are not separable in utility function, consumption should not be continuous

- But could either increase or decrease

## **Initial literature**

Drop in spending around retirement:

- Banks, Blundell, Tanner (AER, 1998)  
UK – Family Expenditure Survey. Synthetic panel
- Bernheim, Skinner Weinberg (AER, 2001)  
US – PSID food spending in panel

# Food spending in PSID panel

From Bernheim, Skinner and Weinberg, AER, 2001

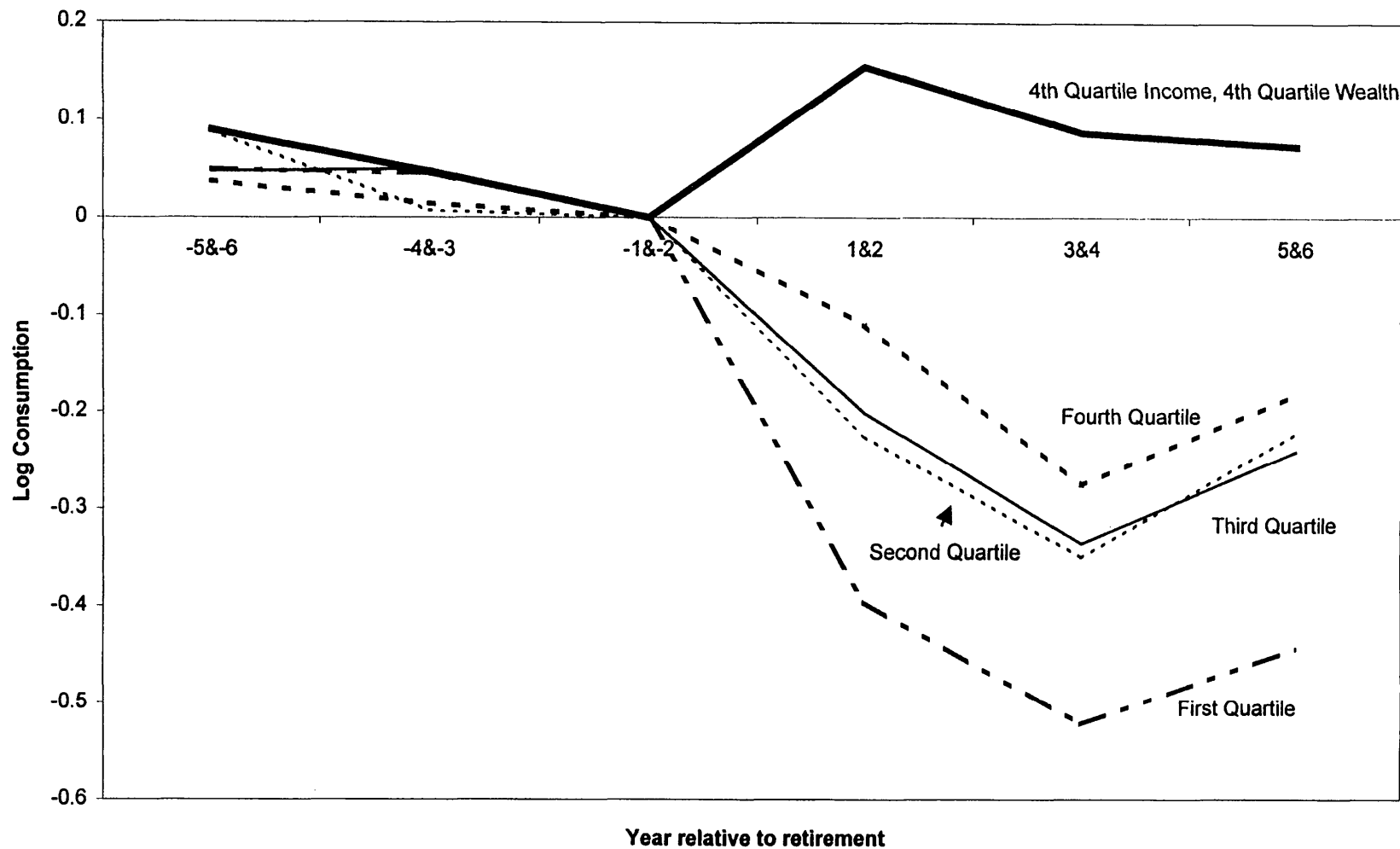


FIGURE 4. CHANGE IN CONSUMPTION AT RETIREMENT, BY WEALTH QUARTILE

## Interpretation

- Many workers are surprised by inadequate resources when they retire
- Forced to reduce consumption.
- Interpreted as evidence for
  - Inadequate economic preparation for retirement
  - Widespread lack of forward-looking behavior
  - Possibly lack of self control
- Damaging to life-cycle model

Bernheim, Skinner Weinberg (AER, 2001)

“If households follow heuristic rules of thumb to determine saving prior to retirement, and if they take stock of their financial situation and make adjustments at retirement (so that the adequacy of saving is “news”), then one would expect to observe the patterns documented in this paper (p. 855).”

## **These and other possible explanations for a drop**

- Lack of foresight
  - Reduction forced by budget constraint
- Foresight but lack of control
  - They knew they should have saved but couldn't
  - Reduction forced by budget constraint
- Work-related expenses
- Home production or more efficient shopping
- Health or other shocks
  - Induced retirement and reduction in spending...unexpected drop in lifetime resources



## **Additional literature**

### 1. Synthetic Panels: Drop in spending

- Aguiar and Hurst (2007)
- Fisher et al (2005)
- Laitner and Silverman (2005)
- Battistin et al (2007) in Italian data
- Miniaci, Monfardini, Weber (2007) in Italian data

But note: synthetic panel can only say about total spending in cohort. Cannot answer many questions about a drop

- Large drop among a few people?
- Smaller drop among many people?
- Who had drop? Wealthy, poor, those in bad health?

## **Additional literature (cont)**

### 2. Food spending in panel

- Haider and Stephens (2007)
  - yes in PSID & RHS
  - no in HRS
- Sarah Tanner Smith (2006): most had no decline; 24% had decline associated with early retirement; just 19% had unexplained drop

## **Additional literature (cont)**

3. Home production or more efficient shopping
  - Aguiar and Hurst (2005): although spending of food declined at retirement, actual consumption did not
  - Aguiar and Hurst (2007): prices paid (scanner data) by those 65 or over are lower than by younger people

## **This work**

Direct test of forward-looking behavior:

- Is drop in spending anticipated? (in cross-section and in panel)

Evidence of changes in spending at retirement using

- panel data (rather than synthetic cohorts)
- total spending, total nondurable spending and food spending rather than just food spending.

# Data

## Health and Retirement Study (HRS)

2000: HRS Core

2001: CAMS wave 1

2002: HRS Core

2003: CAMS wave 2

2004: HRS Core; new cohorts (ages 51-56)

2005: CAMS wave 3

2006: HRS Core

## **Consumption and Activities Mail Survey (CAMS)**

- Biennial mail survey (2001, 2003, 2005, 2007 ...)
- Self administered
- Random sub sample of the Health and Retirement Study (5000 households) in October 2001
- Response rate was 77.3%
- Sent to same households in Oct. 2003.
- Sent to same households in Oct. 2005 plus and additional 850 from new cohort

Thus have three waves and two transitions

## **CAMS content**

Part A. 36 activities (time-use) categories:

Part B. 32 consumption categories:

- 6 big ticket items (durables)
  - 26 non-durable items
  - Consumption categories designed following CEX
- Anticipated and recollected spending change at retirement
  - Spending change to hypothetical income change

Are you retired?

Yes → Complete **BOX A**

No → Complete **BOX B**

**BOX A – Retired:**

**a.** How did your **TOTAL** spending change with retirement?

Stayed the same → **Go to c**

Increased

Decreased

**b.** By how much?

%

**BOX B – Not Retired:**

**d.** How do you expect your **TOTAL** spending to change with retirement?

Stay the same → **Go to f**

Increase

Decrease

**e.** By how much?

%



## **Link CAMS to HRS to obtain**

Income

Wealth

Health status

Education

etc

## CAMS wave 1 cross-section

**Recollected** percent change in spending at retirement (weighted).

**Retirement age** found from prior waves of HRS

Retirement age	N	Mean	Std. Err.	Median
50-54	154	-16.2	2.1	-1.0
55-59	301	-12.7	1.5	0.0
60-64	592	-13.2	0.9	0.0
65-69	237	-14.7	1.5	-5.0
70-74	22	-14.9	4.6	-20.0
All	1,306	-13.8	0.7	0.0

Note: Current age greater than or equal to 50 and less than 80.

- 49% recollected no reduction (not shown)
- Unlike interpretations from synthetic panel, drop not a population-wide event.

**Anticipated** percent change in spending at retirement (weighted)

Age	N	Mean	Std. Err.	Median
50-54	158	-19.4	1.5	-20.0
55-59	289	-23.1	1.2	-25.0
60-64	263	-16.1	1.4	-20.0
65-69	105	-16.7	1.9	-10.0
<b>All</b>	<b>815</b>	<b>-20.1</b>	<b>0.7</b>	<b>-20.0</b>

Thus any actual spending change was not a surprise.

Difference between anticipations and recollections.

Similar to Ameriks, Caplin and Leahy (2007).

(Won't hold in panel)

# CAMS Panel

Empirical strategy simple

Observe household spending before and after retirement

Study change

451 retirements between CAMS waves

Deleted 66 observations: age less than 50 or greater than 70

385 in our analytical sample

Also use **recollections** sample

1,303 observations from various waves of CAMS

Retired before CAMS but recollect spending change

Use to increase sample size for a few analyses.

## Empirical objectives

Answer question: with better data do we see drop in spending at retirement?

Among subpopulations

Which have drops

Characteristics

How many people?

## Three types of statistics

1.  $\Delta \bar{s}_t = \frac{\sum s_{i,t+1}}{\sum s_{i,t}}$ , the ratio of mean spending for two adjacent waves: “population mean”

2.  $\Delta s_t^{med} = \frac{s_{t+1}^{med}}{s_t^{med}}$ , the ratio of median spending in two adjacent waves: “population median”

3.  $(\Delta s_{i,t})^{med}$ , the median of household spending ratios in two adjacent waves: “individual or household median”

Another possible statistic is  $\frac{1}{n} \sum \frac{s_{i,t+1}}{s_{i,t}}$ , the mean of household

level spending ratios has considerable bias because of observation error on  $s$ . (Produces large positive numbers...spending increase!)



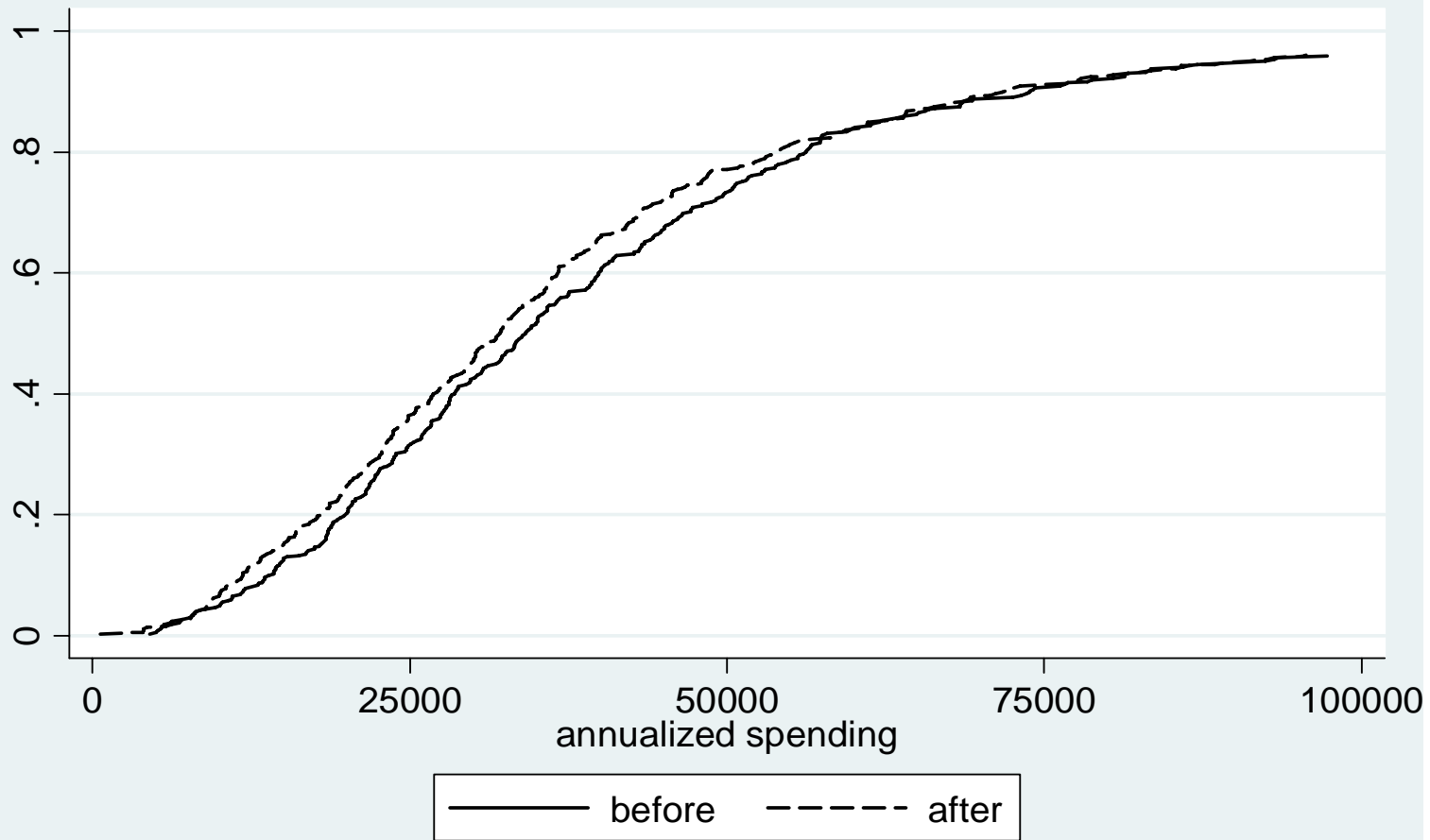
Average and median CAMS spending before and after retirement. N = 385

	Total spending	Nondurable	Food
<b>Means</b>			
Pre-retirement	40,464	35,749	6,188
Post-retirement	38,552	34,635	5,998
Percent change	-4.7	-3.1	-3.1
95% confidence interval	(-10.9, 1.9)	(-9.0, 3.5)	(-12.0, 6.5)
<b>Medians</b>			
Pre-retirement	34,130	29,438	5,146
Post-retirement	32,109	29,282	4,960
Percent change	-5.9	-0.5	-3.6
95% confidence interval	(-13.2, 2.6)	(-8.8, 7.6)	(-15.4, 4.6)
Household-level change	-5.7	-2.4	-3.0
95% confidence interval	(-11.8, 0.6)	(-5.6, 2.9)	(-8.8, 6.9)

Spending drop of 0.5% to 5.9%. Cannot reject hypothesis of no drop. Confidence interval fairly small despite small sample.

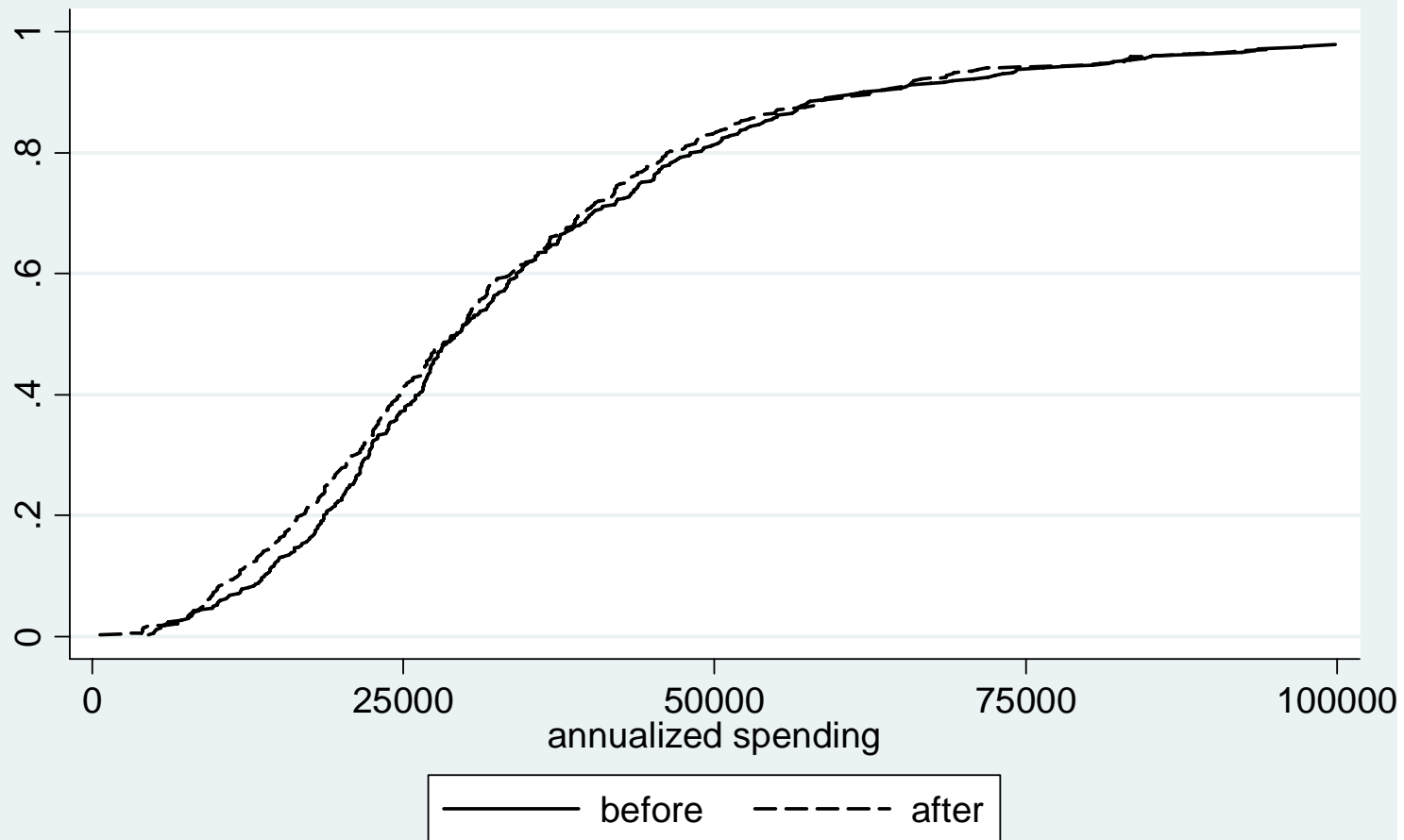
# Observed Total Spending Before and After Retirement

Amounts in 2003 dollars



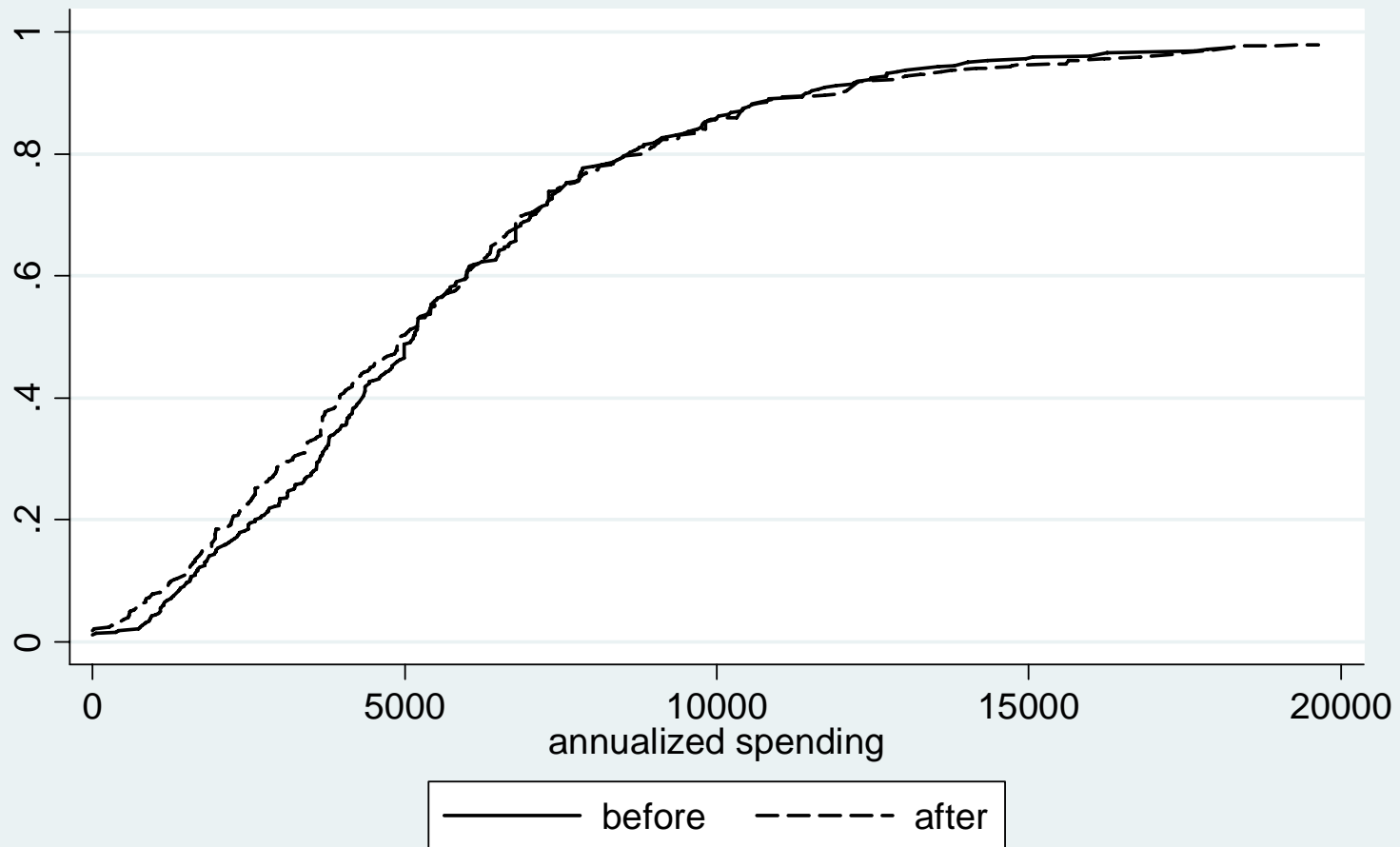
# Observed Non-durable Spending Before and After Retirement

Amounts in 2003 dollars



# Observed Food Spending Before and After Retirement

Amounts in 2003 dollars



## Conclusion:

At the population level, modest declines. Consistent with work-related expenses, health shocks, increased home productions etc.

Look in a little more detail.

Concentrate on nondurable spending...same as consumption.

Variation by economic status, especially low wealth

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Real nondurable spending before and after retirement. N = 385

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	Wealth quartiles				All
	lowest	2	3	highest	
<b>Means</b>					
Pre-retirement	28207	33223	36697	45125	35749
Post-retirement	25405	28632	36571	48268	34635
Percent change	-9.9	-13.8	-0.3	7.0	-3.1
<b>Medians</b>					
Pre-retirement	25336	27619	32822	34288	29438
Post-retirement	19848	26420	31085	40369	29282
Percent change	-21.7	-4.3	-5.3	17.7	-0.5
Household-level change	-7.8	-6.9	-0.5	8.6	-2.4

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Spending level varies by wealth quartile

Spending in panel increases at high wealth; decreases at low wealth

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Real income changes associated with retirement. N = 375

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	Wealth quartiles				
	1	2	3	4	All
<b>Means</b>					
Pre-retirement	36,908	51,726	68,270	128,285	71,150
Post-retirement	30,198	33,392	47,878	109,347	55,090
Percent change	-18.2	-35.4	-29.9	-14.8	-22.6
<b>Medians</b>					
Pre-retirement	22,857	47,792	50,036	99,296	48,900
Post-retirement	17,479	28,386	38,080	58,912	33,804
Percent change	-23.5	-40.6	-23.9	-40.7	-30.9
Household-level change	-5.0	-36.0	-32.0	-16.6	-21.3

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Large drop in income; much smaller drop in spending. Consumption smoothing

Smaller drop in first quartile: importance of Social Security



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Household-level change	<b>-5.0</b>	-36.0	-32.0	-16.6	-21.3

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First quartile: household-level change in spending almost same as household-level change in income: **-7.8 versus -5.0**

Required by lack of wealth

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Non-housing and total wealth prior to retirement (2003\$)

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		Wealth quartile				
		1	2	3	4	All
Non-housing	Median	2,078	27,611	122,593	457,239	55,222
	Mean	5,994	37,300	126,167	828,325	248,643
Total	Median	16,235	102,713	229,610	661,561	158,961
	Mean	26,116	104,655	241,332	1,082,256	362,292

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Very low levels of wealth in lowest quartile

Anticipated and recollected change in spending at retirement (percent)  
by wealth quartile, panel. N = 304.

	Wealth quartile before retirement				
	Lowest	2	3	Highest	All
Average change					
Anticipated	-11.2	-18.9	-14.9	-13.8	-14.7
Recollected	-23.0	-12.3	-12.2	- 9.4	-14.3
Recollected minus anticipated	-12.4	6.9	3.0	4.4	0.4
Median change					
Anticipated	0.0	-20.0	-5.0	-10.0	-10.0
Recollected	-15.0	-10.0	0.0	0.0	0.0
Recollected minus anticipated	-15.0	10.0	10.0	10.0	10.0

Almost perfect match between anticipations and recollections  
In lowest quartile and possibly 2<sup>nd</sup> recollected decline larger than  
anticipated. Quartiles 3 and 4 had smaller declines than anticipated.

Study characteristics of households that had declines (besides wealth)

- Lack of forward-looking behavior
- Health shock

## **Financial planning horizon**

In deciding how much of their income to spend or save, people are likely to think about different financial planning periods. In planning your saving and spending, which of the following time periods is most important to you, the next few months, the next year, the next few years, the next 5-10 years, or longer than 10 years?

Code long horizon: next few years or 5-10 years

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Median of household-level change in nondurable spending (percent):

Planning horizon

N = 384

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Planning horizon	Wealth quartile				
	lowest	2	3	highest	All
Short horizon	-17.7	-15.4	8.3	14.7	-10.0
Long horizon	-1.1	-0.8	-3.3	6.1	-0.1
All	-7.8	-6.9	-0.5	8.9	-2.7
<i>Percent with short horizon</i>	<i>40.8</i>	<i>24.0</i>	<i>22.9</i>	<i>8.5</i>	<i>24.2</i>

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Note: A short planning horizon is a planning horizon of a year or less.

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Short horizon: 24.2% of sample. Highest percent in lowest quartile (40.8%)

Decline in spending concentrated in short horizon people in bottom half of wealth distribution...16% of sample

## **Health**

No decline among those in excellent/very good health prior to retirement...half sample

Decline of about 7% among those in fair/poor health

But fair/poor health not necessarily reason for spending decline

Change in health and early retirement important

Direct question about whether health was an important reason for retirement

Real nondurable spending before and after retirement: Importance of health as a reason for retirement

	Not important	Important	All
<b>Means</b>			
Pre-retirement	36,957	33,419	36,101
Post-retirement	39,054	30,541	36,995
Percent change	5.7	<b>-8.6</b>	2.5
<b>Medians</b>			
Pre-retirement	30,670	31,216	30,681
Post-retirement	30,780	27,945	30,048
Percent change	0.4	-10.5	-2.1
Household-level change	-3.0	<b>-17.0</b>	-0.4
<i>N</i>	163	52	215

Spending decline associated with whether health was important.



Sample size too small to interact wealth with health.

Use “recollections” sample.

Recollected spending change at retirement (percent) by wealth quartile  
N=1,302

Importance of health for retirement	Wealth quartile before retirement				
	Lowest	2	3	Highest	All
<b>Means</b>					
Important	-24.0	-24.6	-17.7	-12.2	-21.6
Not important	-14.9	-15.6	-11.5	-6.4	-11.5
All	-19.9	-18.6	-13.1	-7.2	-14.7
<b>Medians</b>					
<b>Important</b>	<b>-25.0</b>	<b>-25.0</b>	<b>-20.0</b>	<b>0.0</b>	<b>-20.0</b>
<b>Not important</b>	<b>0.0</b>	<b>-10.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
All	-15.0	-20.0	0.0	0.0	0.0
<i>Percent where health important</i>	<i>54.2</i>	<i>33.8</i>	<i>25.4</i>	<i>15.0</i>	<i>32.3</i>

Wealth and health interaction.

Median: health not important reason...no decline

Health shock and early retirement

Use subjective probability of working past 62 or 65.

Asked of workers:

## **Subjective probability of working past 62 or 65.**

"On the same scale from 0 to 100 where 0 equals absolutely no chance and 100 equals absolutely certain, ...

(Thinking about work in general and not just your present job,) what do you think the chances are that you will be working full-time after you reach age 62?"

Call this P62

Also asked about target age 65

Call this P65

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Subjective probability of working past 62 and past 65 and actual

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retirement age (averages)			
Wealth quartile	P62	P65	Actual
Lowest	46.8	28.7	62.0
2	47.8	23.6	62.2
3	43.6	21.3	62.2
Highest	39.1	18.9	63.1
All	44.3	23.0	62.4

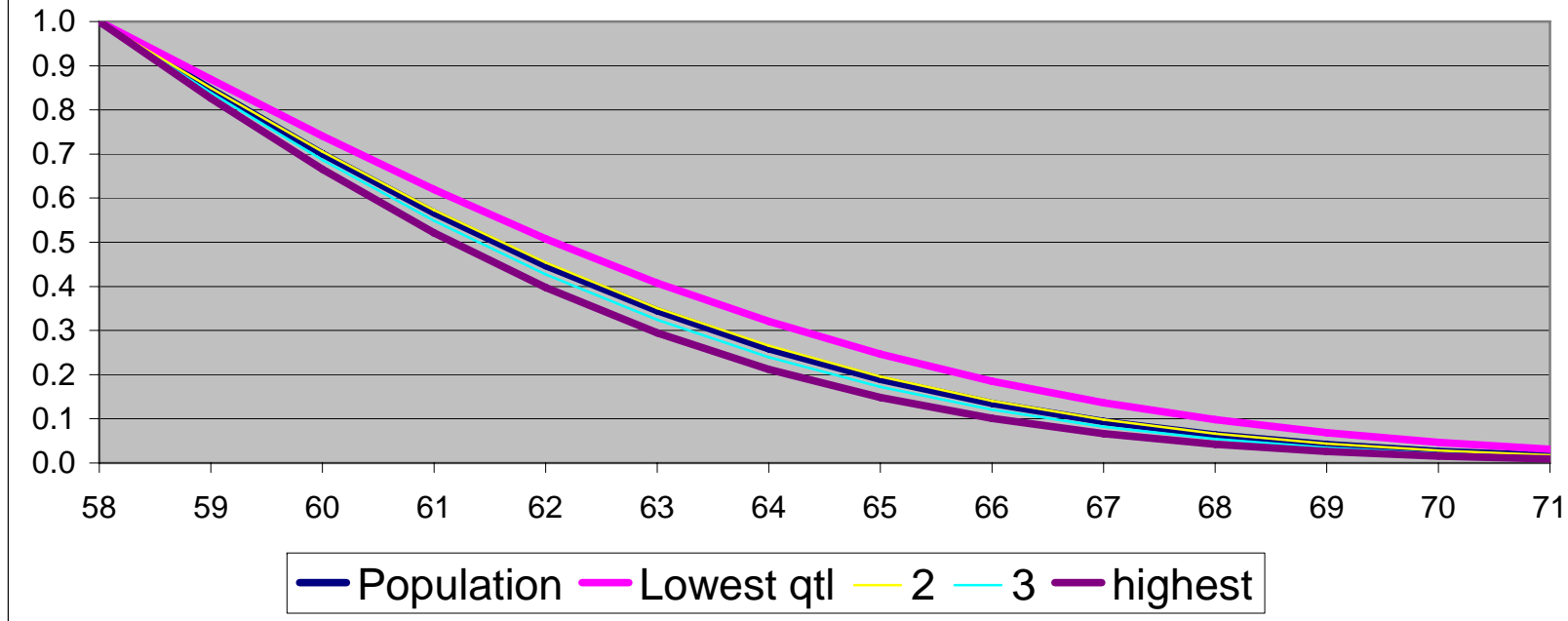
Note: P62 and P65 are the subjective probabilities of working full-time past the age of 62 and 65 respectively. Recollections sample. All retired.

Lowest quartile had highest P65 but lowest actual retirement

Retired earlier than expected relative to other quartiles.

Use proportional hazards model to map P65 into expected retirement age. Baseline hazard found from transitions into retirement in HRS panel.

**Figure 2. Survival in employment**



Area under survival curve is expected survival in employment

Expected and actual retirement age					
	Wealth quartile				All
	lowest	2	3	highest	
Expected years of survival in employment	5.3	4.8	4.6	4.3	4.7
Expected retirement age	63.3	62.8	62.6	62.3	62.7
Actual retirement age	62.0	62.2	62.2	63.1	62.4
Actual minus anticipated	-1.3	-0.6	-0.4	0.8	-0.3

First quartile had highest expected retirement age but lowest actual

Monetary value of 1.3 years of employment \$13.8 thousand

Non-housing wealth of lowest quartile = \$2.1 thousand at median



Use same method for health-wealth interaction:

Those in lowest quartile where health was an important factor in retirement retired about 1.3 years earlier than expected.

Regression to control for interactions between wealth, health and planning horizon

With and without education

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Median regression estimates for change in spending at retirement

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	Coeff	p-value	Coeff	p-value
lowest wealth quartile	--	--	--	--
2	-4.2	0.573	-4.6	0.485
3	-7.6	0.369	-7.4	0.322
Highest	-5.5	0.528	-1.0	0.898
long planning horizon	--	--	--	--
short planning horizon	-9.1	0.262	-14.6	0.021
short planning horizon and high wealth	24.5	0.027	33.0	0.004
Health important for retirement	-20.7	0.007	-22.3	0.001
education less than high school	--	--		
High school	12.2	0.126		
some college	12.3	0.083		
college or greater	21.8	0.006		
Constant	-3.6	0.715	10.4	0.149

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Not including education: Wealth per se not significant

- Short planning horizon and low wealth
- Health important for retirement

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- Including education: wealth per se not significant
- Health important for retirement
- Education gradient

## **Use of increased leisure time in home production**

House cleaning

Yard work/gardening

Food preparation

Home improvements

Washing, ironing

Shopping

Finances

Total increase: 5.2 hours per week

But when health was an important factor in retirement the increase in hours was just one hour per week

Would like to find percent of population with large declines and characteristics of those with declines.

Cannot look at declines individual by individual  
...measurement error on spending change

Find percent of population in cells that had large declines as indicated by regression

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Percent of sample in cells with median spending decline of more than -10%

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	Panel sample	Recollections sample
Short planning horizon only (1)	2.8	2.6
Health important in retirement only (2)	16.4	18.4
Short planning horizon and health important in retirement (3)	3.3	8.8
<i>N</i>	<i>214</i>	<i>1293</i>

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Notes: (1) Also restricted to education < high school and wealth quartiles 1 and 2; (2) Also restricted to education = some college or less; (3) Also restricted to wealth quartiles 1 and 2.

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Very few had short planning horizon

Main explanation: health important reason for retirement

## Summary and conclusions

- At population level, no retirement-consumption puzzle
- No important evidence for lack of forward-looking behavior
  - At population level consistency between expectations and recollections
- In sub-populations, health main reason for decline
  - Consistent with life-cycle model with uncertainty