

# Retirement and Expenditure in Turbulent Times

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# Retirement and household expenditure in turbulent times

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Research Seminar Series

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# Introduction

- Increasing evidence that consumption sharply declines at retirement
- At odds with lifetime optimising behaviour predictions
- Spatial and temporal consistence:
  - US (Bernheim et al., 2001; Hamermesh, 1984); UK (Banks et al., 1998); Italy (Battistin et al., 2009); France (Moreau & Stancanelli, 2015)
- Explanations:
  - reduction in work-related expenses
  - leisure substitution
  - changes in household composition
  - increased mortality risk

# Introduction

- Scarce evidence on both own & spouse retirement effects
- No evidence on this relationship during a crisis period
- Three contributions in the literature:
  - reconcile retirement-consumption evidence conditional on income
  - incorporate the role of spousal retirement
  - examine household behaviour during bad times
- Three main findings:
  - household consumption declines at retirement; partly due to income
    - decline in lifestyle, work- and housing-related expenses
  - spousal retirement does not affect consumption
  - declines were greater when pension reforms were implemented

## Institutional context

- Greece entered a severe crisis since 2008Q3
  - unemployment  $\approx 28\%$ ; debt/GDP  $\approx 146\%$
- Response: a rescue plan (MoU) along with EC, ECB & IMF in May 2010
  - secure access to government funding conditional on:
    - fiscal consolidation
    - labour market, product market & welfare system reforms
- Two subsequent MoUs followed: 2012, 2015

# Institutional context

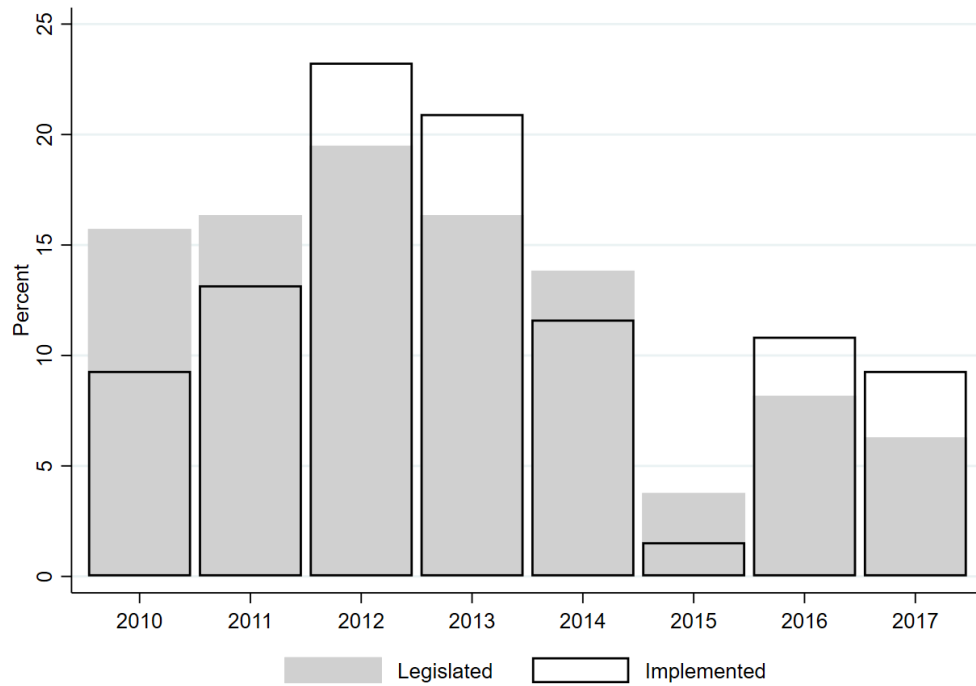
## Major pension reforms

- Pension system went through a series of reforms and cuts
  - Act 3845/2010 (before the first MoU): abolished 13th & 14th pension
  - Act 3863/2010 & Act 3865/2010: new pension calculation formula (activated after 2015); increased Official and Early Retirement Ages (65 & 60 years old, respectively)
  - 2011-2013: a series of pension cuts for those receiving high pensions (and had retired before 55 years old)
  - Act 4093/2012: progressive cuts 5% (€1,000-1,500) to 20% ( $\geq$ €3,000)
  - Act 4254/2012 (implemented on 07/2014): horizontal 5.2% cut
  - Act 4336/2015: new horizontal cuts
  - Act 4387/2016: several changes were generalised to entire population

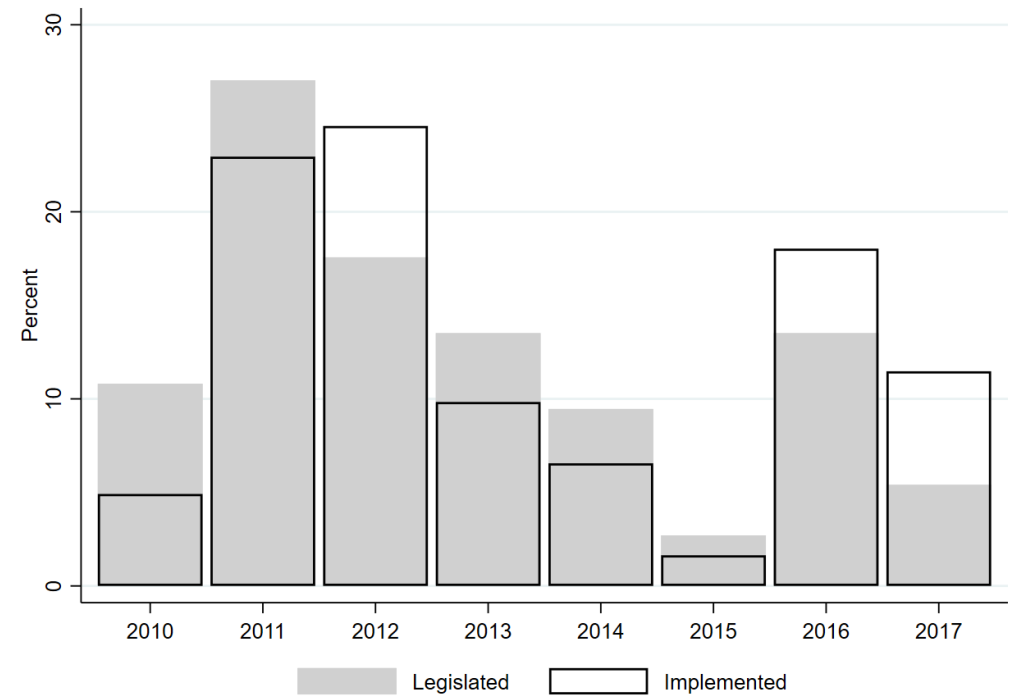
# Institutional context

## Legislated and implemented reforms

### All labour market reforms



### Pension-related reforms

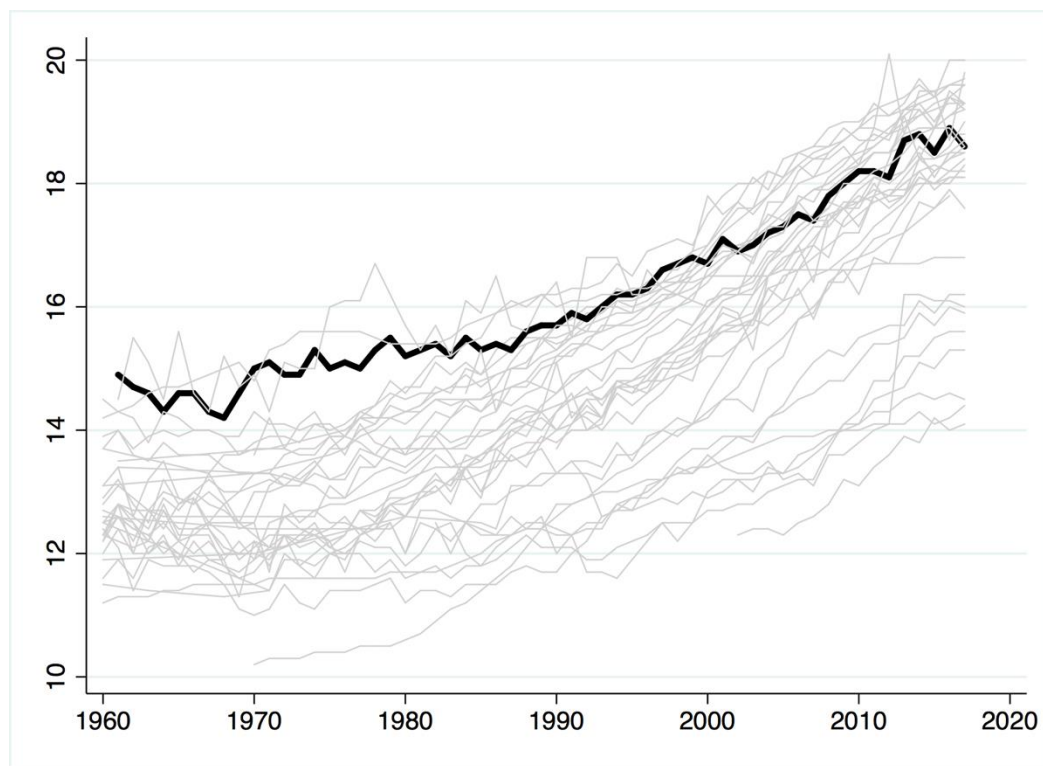


Source: LABREF (European Commission, Employment Committee).

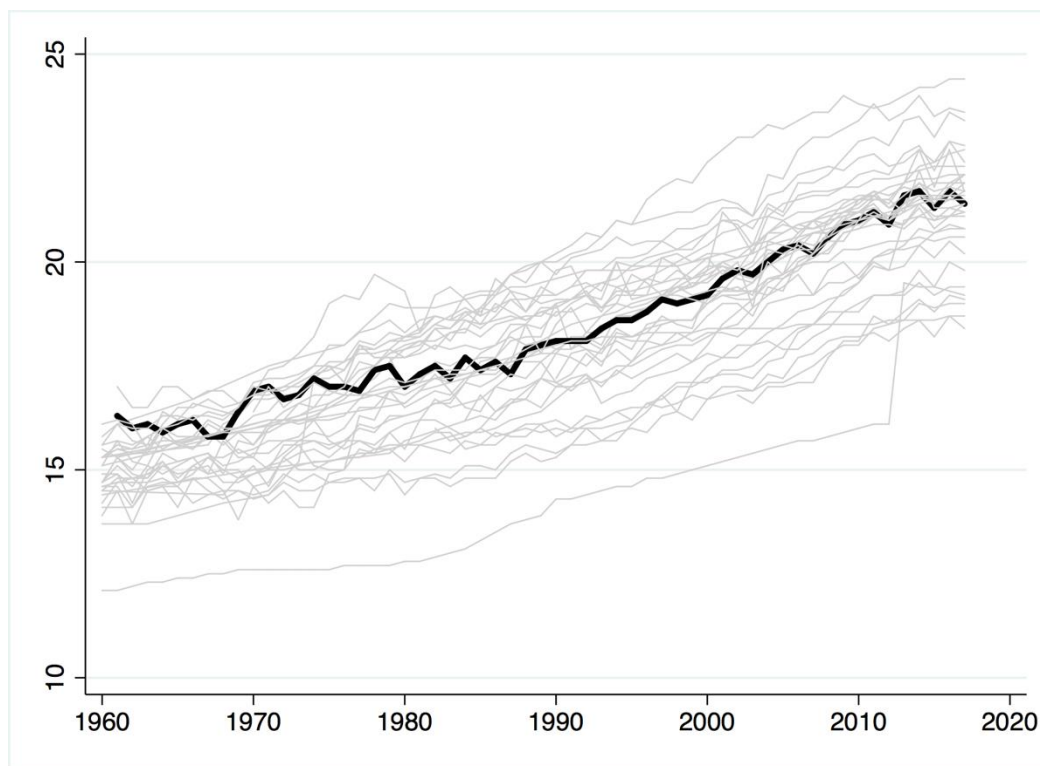
# Demographic background

## Life expectancy at age of 65 in OECD countries

Men



Women



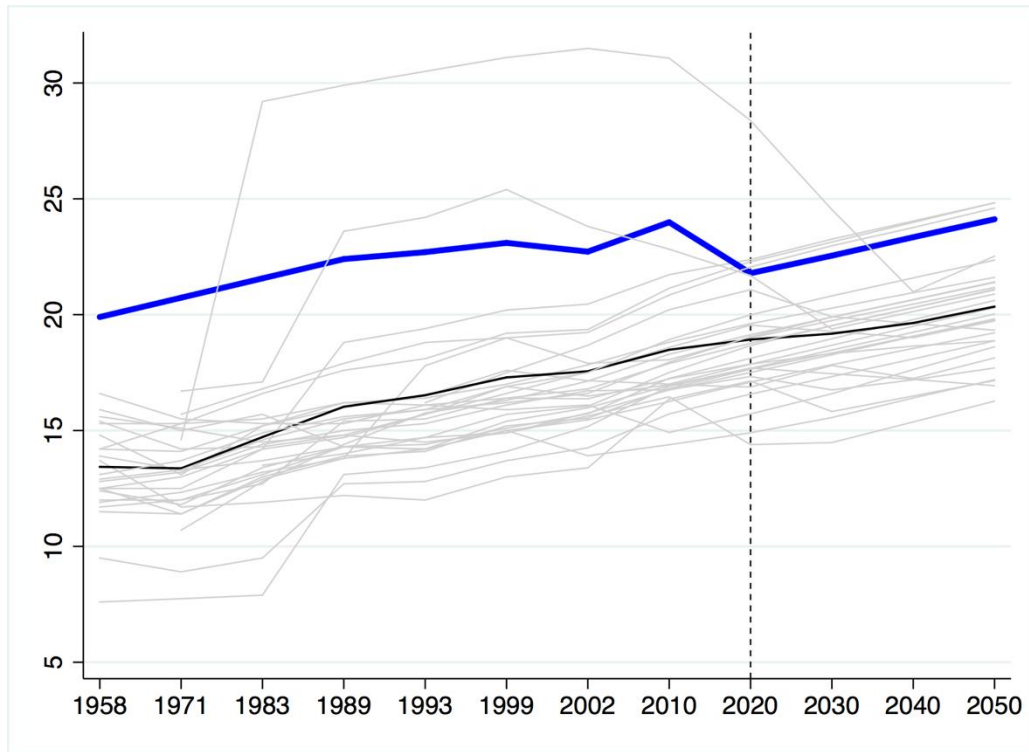
Source: OECD (2019), Life expectancy at 65 (indicator).



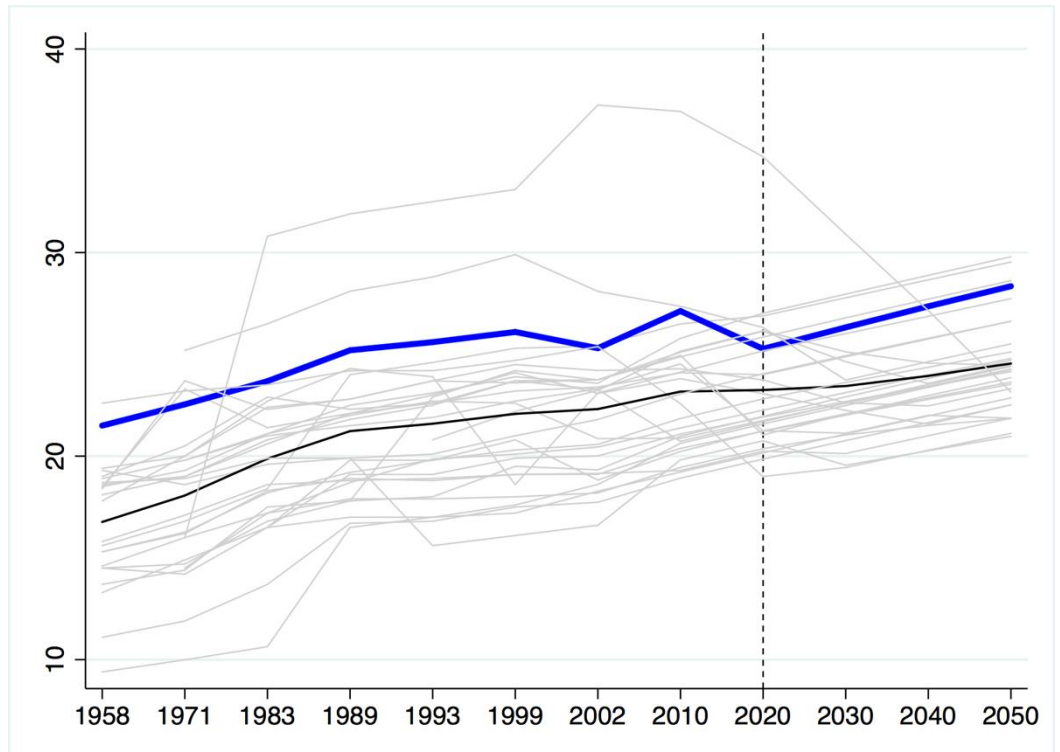
# Demographic background

## Life expectancy after pensionable age in OECD countries

Men



Women

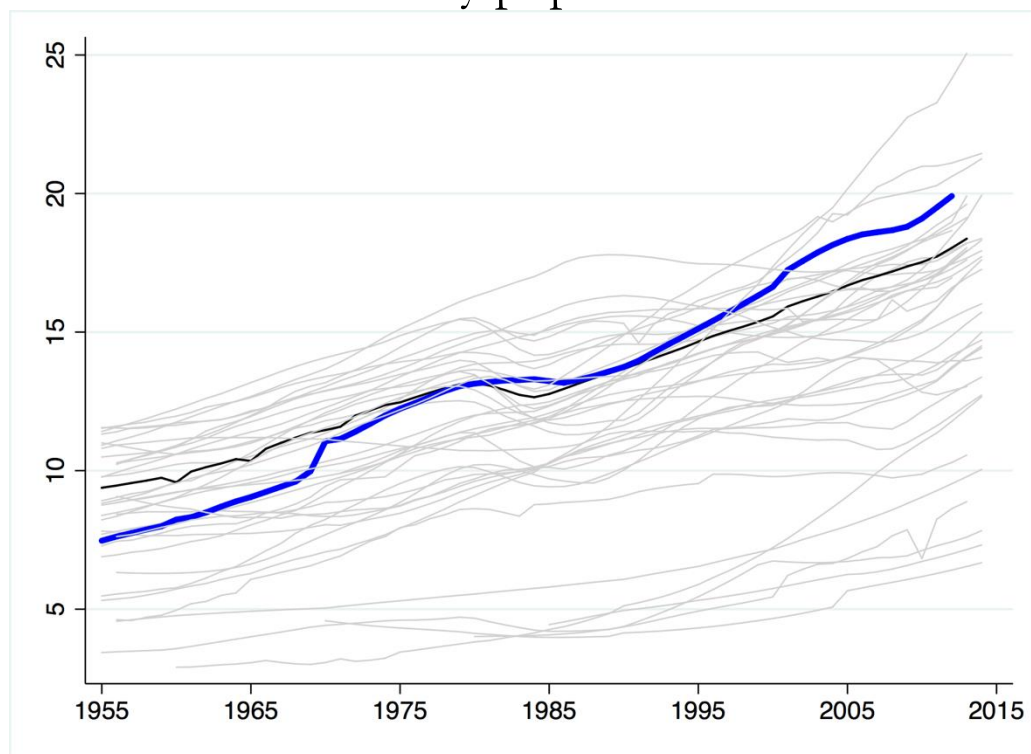


Source: OECD Pensions at a Glance (2011): Retirement-income Systems in OECD and G20 Countries.

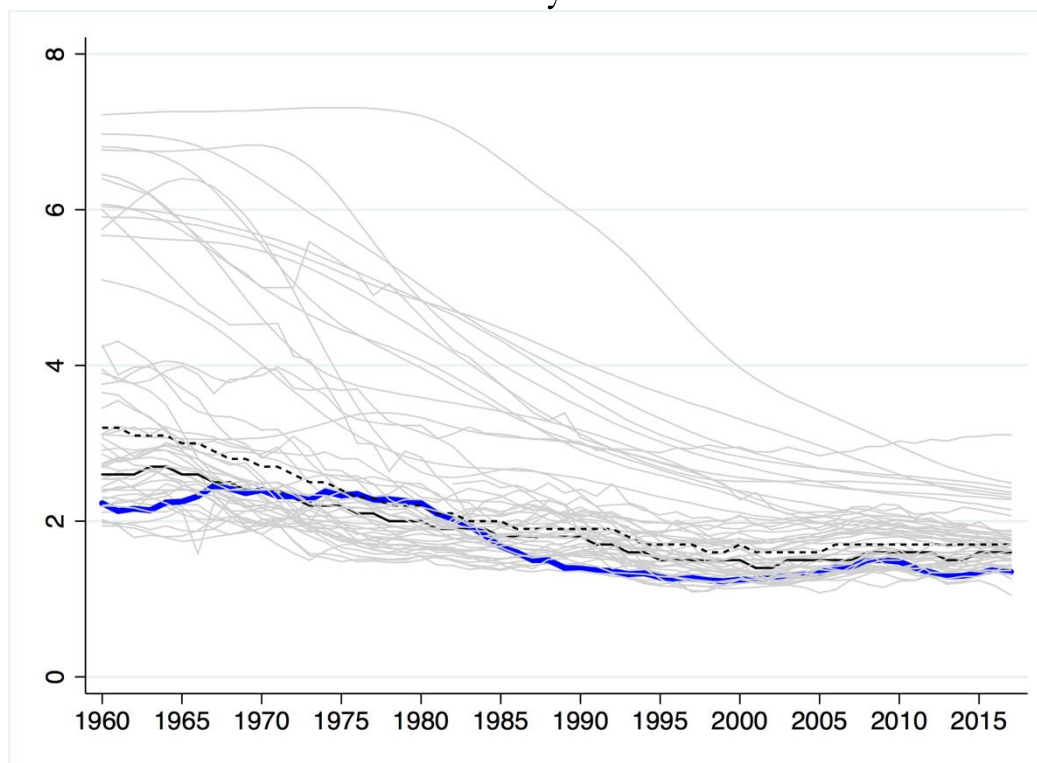
# Demographic background

## Elderly population and fertility rate in OECD countries

Elderly population



Fertility rate

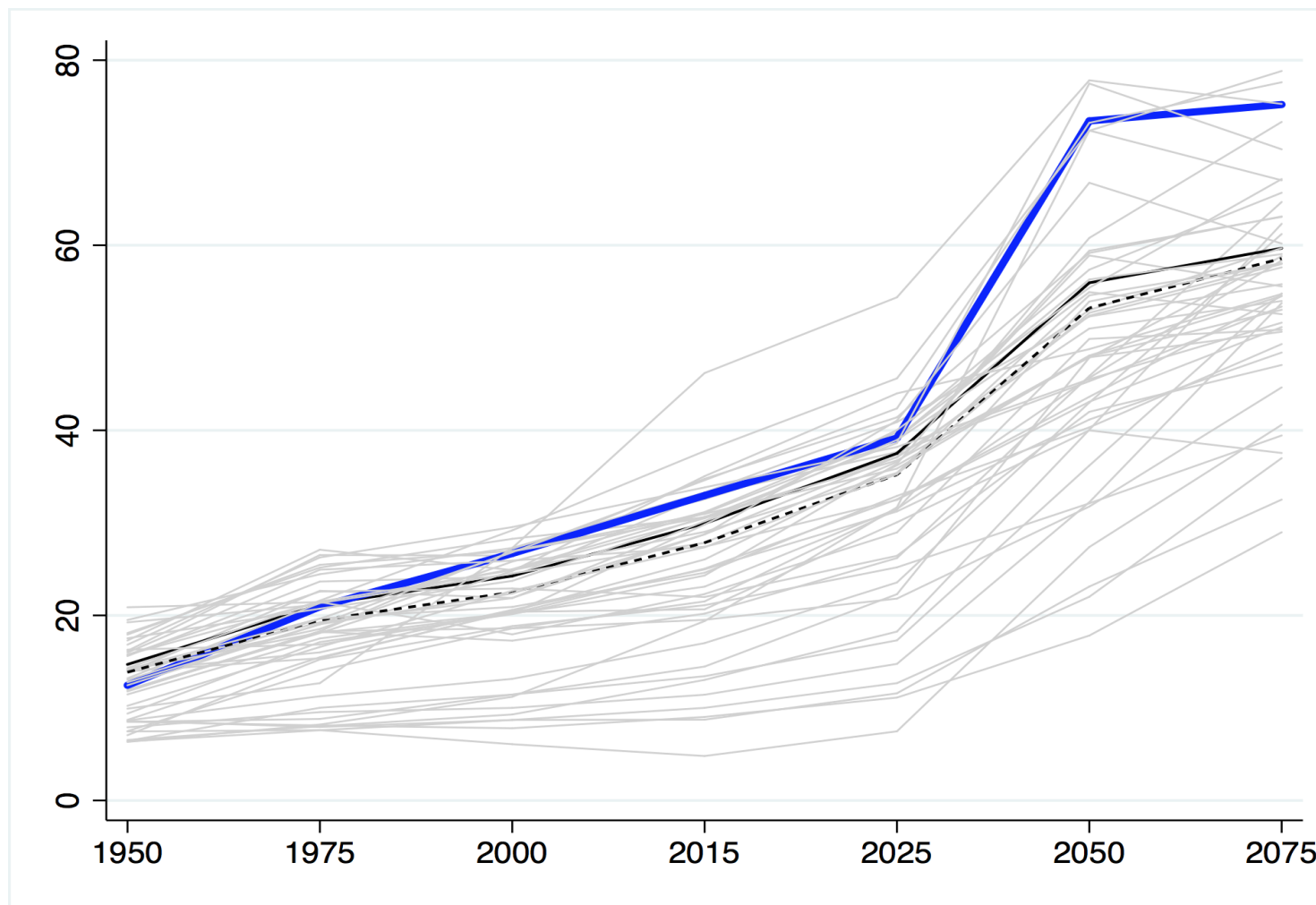


Source: OECD (2019), Elderly population (indicator); OECD (2019), Fertility rates (indicator).

Notes: The elderly population is defined as people aged 65 and over (% of population). The total fertility rate in a specific year is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates.

# Demographic background

## Historical and projected old-age dependency ratios in OECD countries



Source: OECD Pensions at a Glance (2017)

Notes: The demographic old-age dependency ratio is defined as the number of individuals aged 65 and over per 100 people of working age defined as those aged between 20 and 64 years old.

## Data sources

- Individual & household level data (Household Budget Survey 2009-2016)
  - 87,360 individuals in 35,710 households
- Demographics, activity status, household composition, household income
- Household-level expenses (detailed breakdown)
- Estimation sample: household heads (expenses vary at household level)
  - drop: unmarried/cohabiting and widowed (if not living alone)
  - drop: unemployed and those mainly relying on unemployment benefits
  - drop: same-gender households, military, students, domestic tasks
  - keep: 15 years around Early Retirement Age (ERA)
    - ERA: 55 (2009-2010) → 60 (2011-2012) → 62 (2013-2016)

# Data sources

**Table 1. Descriptive statistics on basic variables.**

<b>Demographics</b>	Total sample	Retired	Non-retired	Diff.:	<b>Expenses</b>	Total sample	Retired	Non-retired	Diff.:
Retired	.518	-	-	-					
Spouse retired	.439	.728	.129	-.599***	Total expenditure	29,510	23,941	35,497	11,555***
Age	60.05	66.84	52.76	-14.072***	Food & non-alcoholic beverages	5,043	4,587	5,533	946***
Female	.058	.055	.061	.006	Alcohol, tobacco etc.	907	695	1,136	441***
Spouse female	.942	.945	.939	-.006	Clothing & footwear	1,624	1,150	2,135	985***
Primary schooling	.286	.372	.194	-.178***	Housing, water, electricity etc.	7,731	6,935	8,588	1,653***
Secondary schooling	.320	.263	.382	.119***	Household equipment	1,415	1,106	1,747	641***
Tertiary schooling	.311	.235	.393	.158***	Health	1,768	1,787	1,747	-40***
Household size	2.94	2.53	3.39	.859***	Transport	3,143	2,301	4,048	1,747***
No. of children	.354	.112	.614	.503***	Communication	1,025	806	1,261	456***
Economically active	2.24	2.22	2.26	.035***	Recreation & culture	1,242	834	1,682	848***
Monetary income	30,884	26,770	35,307	8,537***	Restaurants & hotels	2,721	1,980	3,517	1,537***
Total income	35,286	30,897	40,004	9,107***	Misc. goods & services	1,822	1,414	2,262	848***
Observations	7,304	3,784	3,520	-	Observations	7,304	3,784	3,520	-

Source: Household Budget Survey, 2009-2016; Hellenic Statistical Authority (EL.STAT). *Notes:* Figures in column (4) correspond to the results of *t*-tests for differences in means. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Empirical Strategy

Basic model specification:

$$Y_{ht} = \alpha_0 + \beta_1 R_{mht} + \beta_2 R_{fht} + f(\text{Age}_{mht}) + f(\text{Age}_{fht}) + \delta_t + \varepsilon_{ht} \quad (1)$$

- $Y_{ht}$  is (log of total or other) expenditure of household  $h$  at year  $t$
- $R_{mht}$  and  $R_{fht}$  is retirement status of male and female partners
- second order polynomials in age
- individual controls
- household composition controls
- year fixed effects

# Empirical Strategy

Retirement statuses are instrumented:

$$R_{mht} = \gamma + \gamma_1 Z_{mht} + \gamma_2 Z_{fht} + f(\text{Age}_{mht}) + f(\text{Age}_{fht}) + \delta_t + v_{ht} \quad (2)$$

$$R_{fht} = \tau + \tau_1 Z_{fht} + \tau_2 Z_{mht} + f(\text{Age}_{fht}) + f(\text{Age}_{mht}) + \delta_t + u_{ht} \quad (3)$$

where:

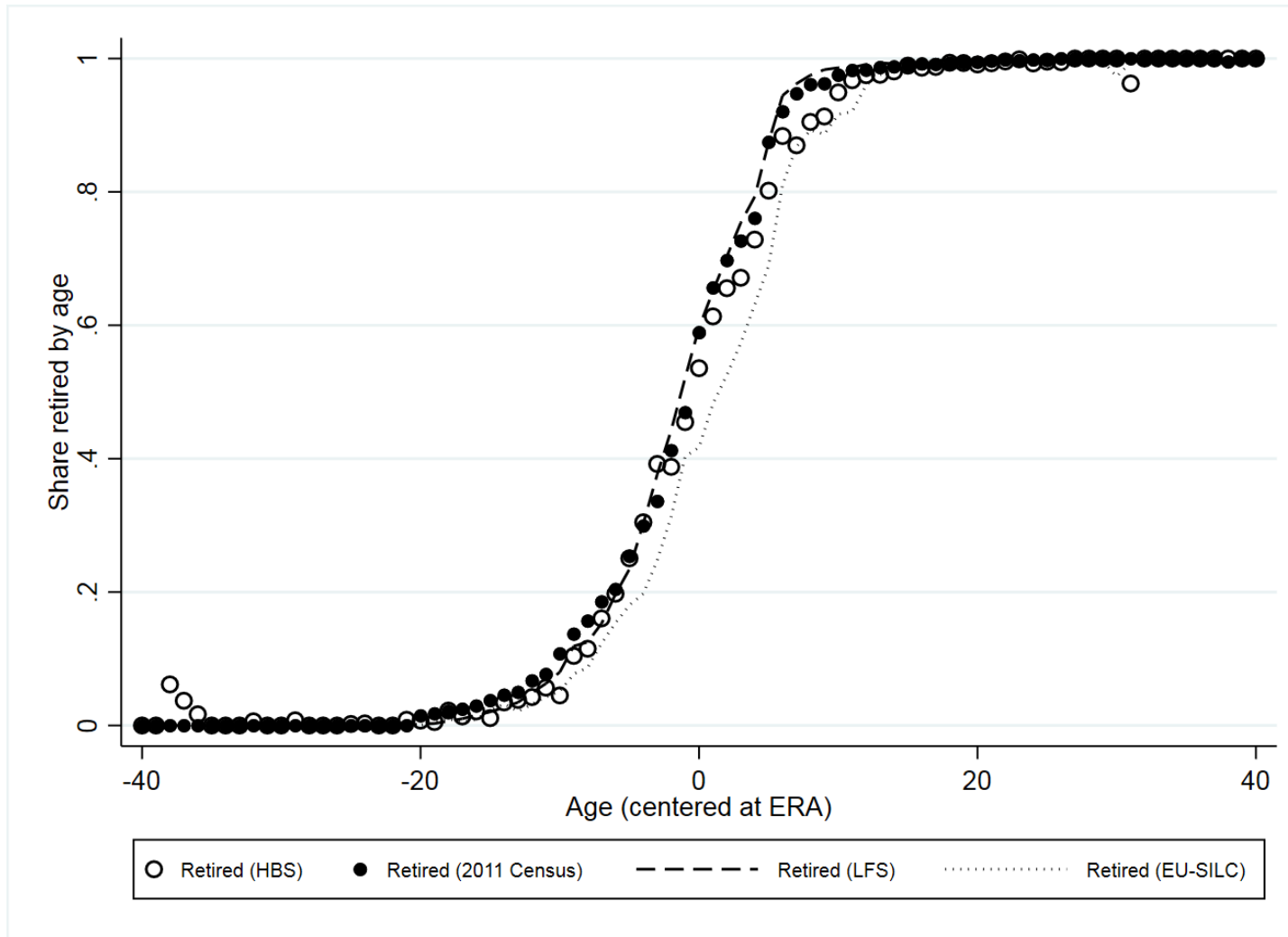
$$Z_{mht} = 1 \text{ if } \text{Age}_{mht} \geq \text{ERA}_{mt}; 0 \text{ if } \text{Age}_{mht} < \text{ERA}_{mt}$$

$$Z_{fht} = 1 \text{ if } \text{Age}_{fht} \geq \text{ERA}_{ft}; 0 \text{ if } \text{Age}_{fht} < \text{ERA}_{ft}$$

Alternative model specification:

$$Y_{ht} = \alpha_0 + \beta_1 R_{mht} + \beta_2 R_{fht} + \beta_3 R_{mht} \times \delta_t + \beta_4 R_{fht} \times \delta_t + f(\text{Age}_{mht}) + f(\text{Age}_{fht}) + \delta_t + \varepsilon_{ht} \quad (4)$$

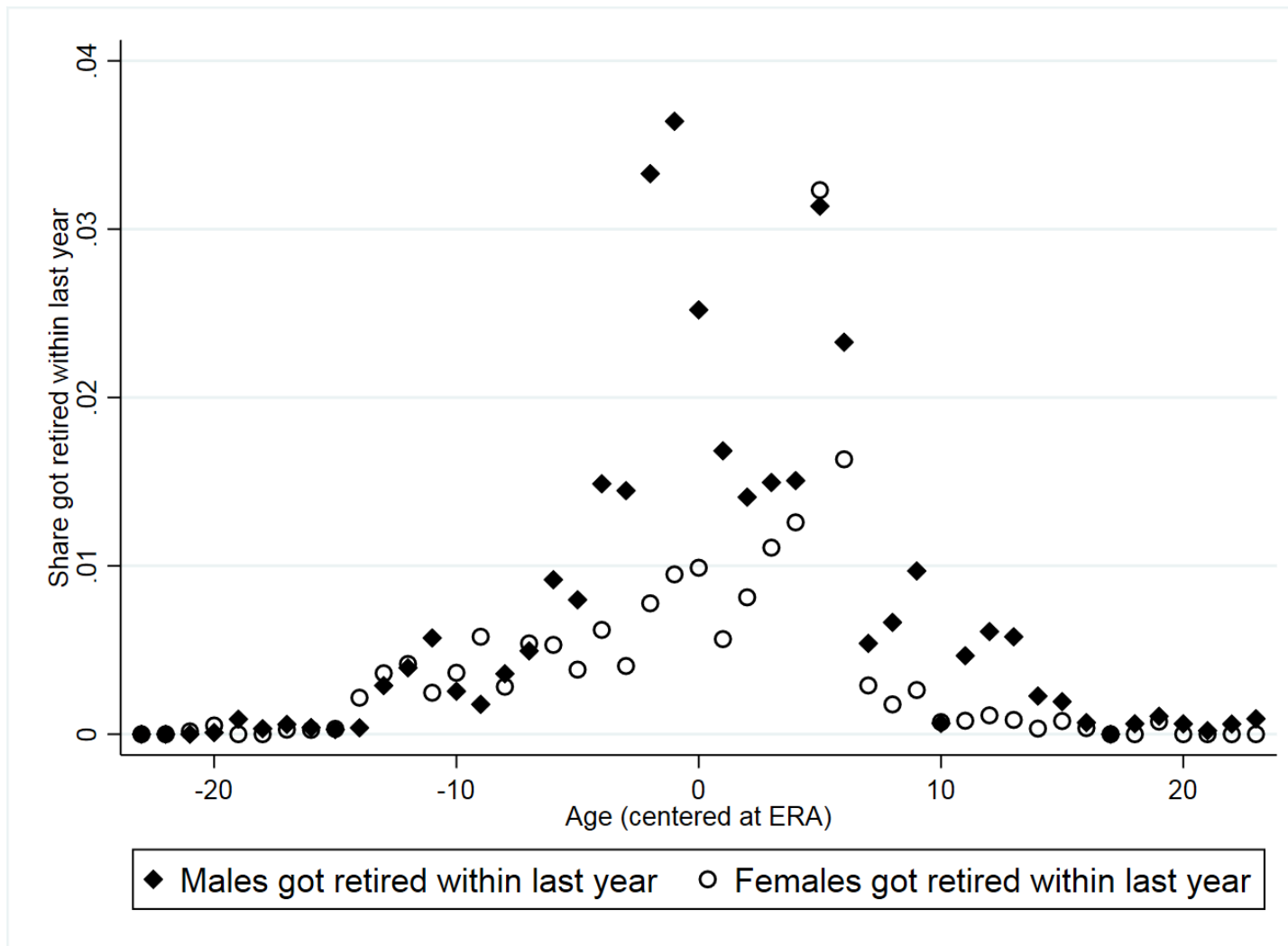
# Instrument relevance and validity



Source: Household Budget Survey (2009-2016); Greek Census (2011); Labour Force Survey (2015Q1-2018Q2); EU-SILC (2009-2017); Hellenic Statistical Authority (EL.STAT). Notes: Shares for each survey are weighted using the respective weights. ERAs are specific to the surveys' time periods.

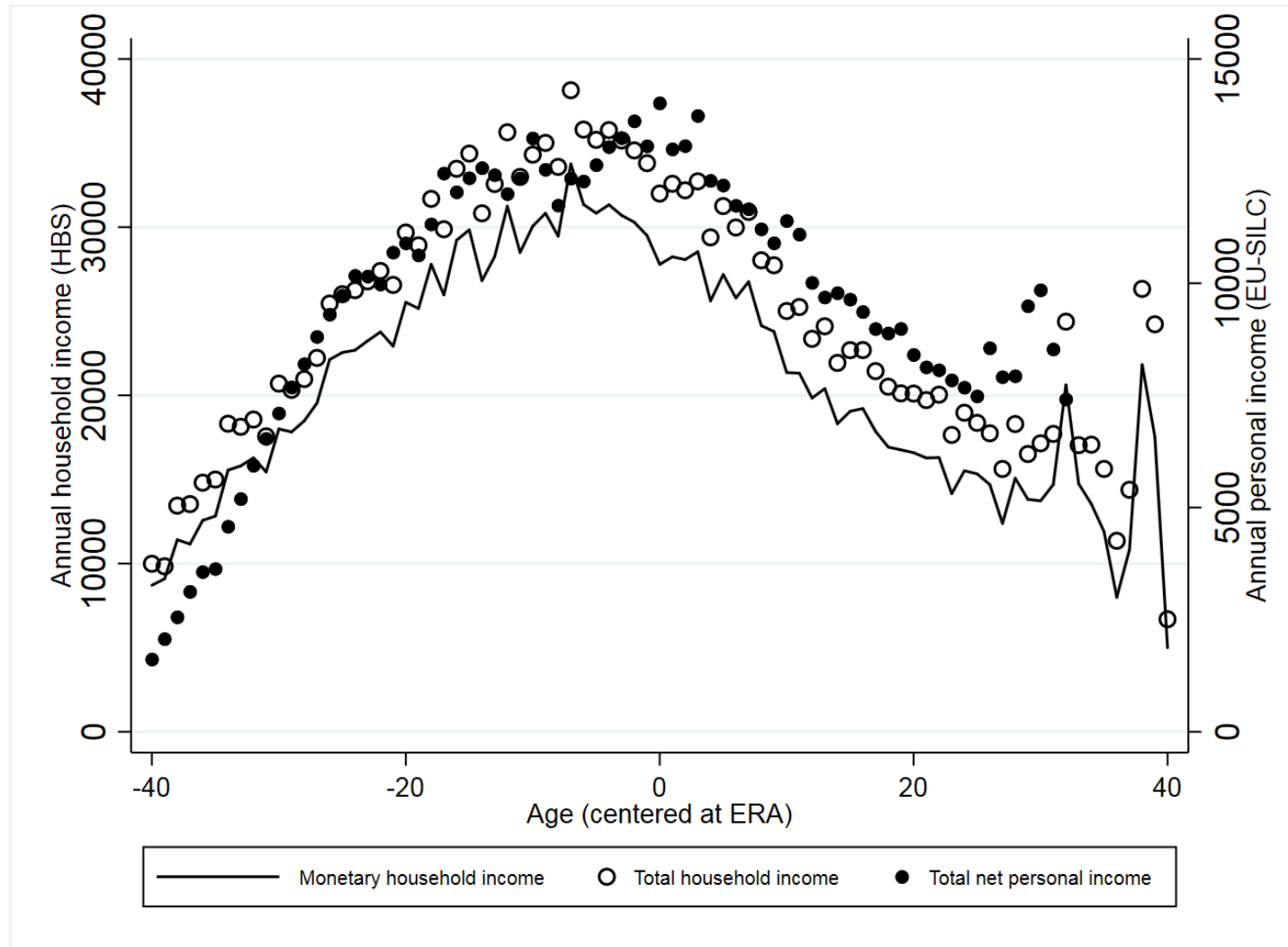


# Instrument relevance and validity



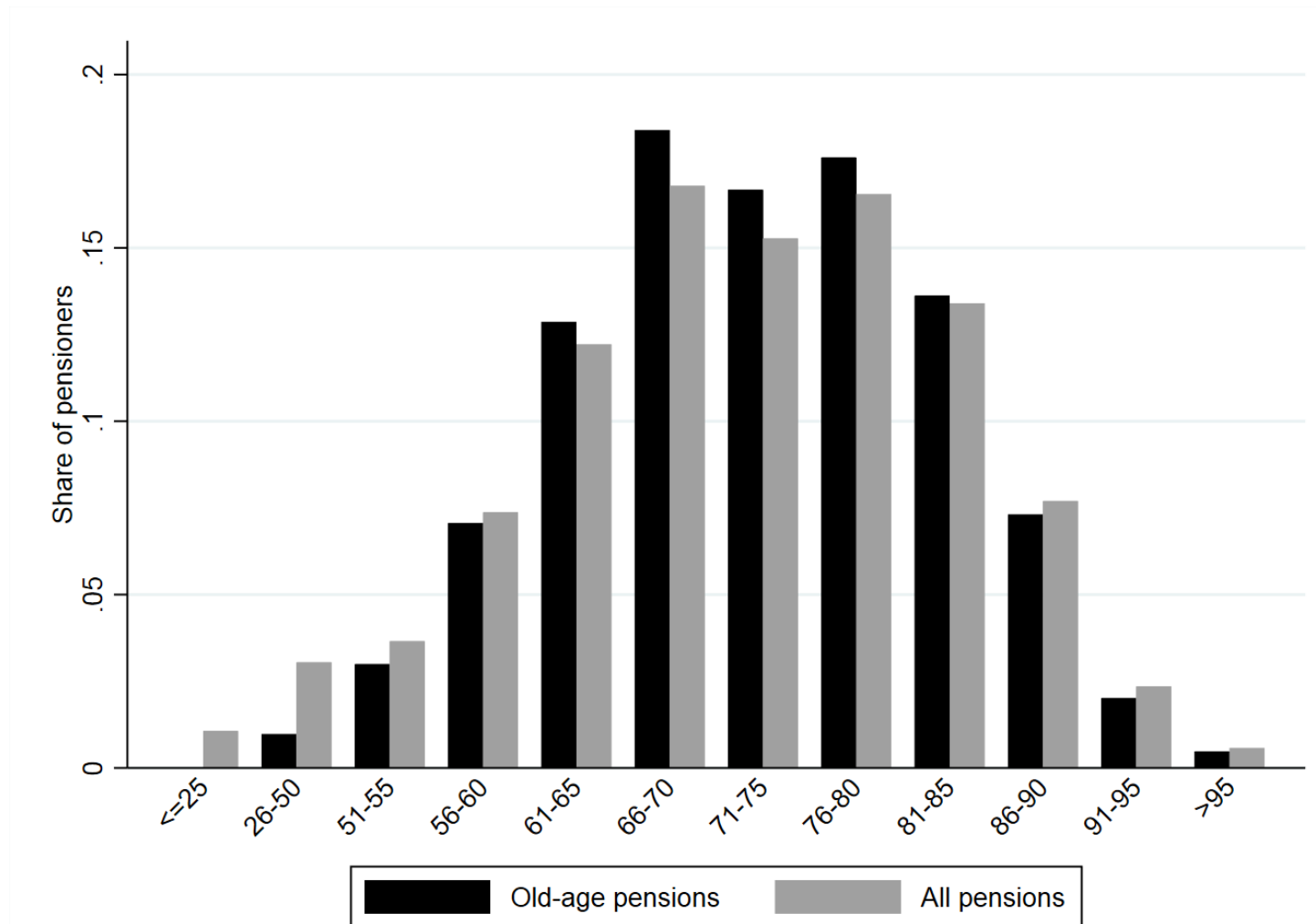
Source: Labour Force Survey (2015Q1-2018Q2); Hellenic Statistical Authority (EL.STAT). Notes: Shares are weighted by the sampling weights.

# Instrument relevance and validity



Source: Household Budget Survey (2009-2016); EU-SILC (2009-2017); Hellenic Statistical Authority (EL.STAT).

# Instrument relevance and validity



Source: Ministry of Labour, Social Security and Welfare. Notes: The data cover the period between October 2013 and December 2016. All pensions include old-age, disability, death and other pension types. Age groups are the default ones as reported in the source.

# Estimation results

**Table 2. First stage results.**

Dependent variable:	Own retirement [1]	Spouse retirement [2]
Own age > ERA	.193*** (.022)	-.035* (.021)
Spouse age > ERA	.031* (.019)	.112*** (.023)
Total household income (ln)	.012 (.009)	.056*** (.009)
Household size (persons)	-.014** (.006)	-.024*** (.006)
Dependent children in household	-.043*** (.016)	.051*** (.015)
F-test of excluded instruments	30.73	31.47
Individual controls	Yes	Yes
Household controls	Yes	Yes
Year fixed effects	Yes	Yes
Observations	6,883	6,883

Source: Household Budget Survey, 2009-2016; Hellenic Statistical Authority (EL.STAT).

Notes: Linear probability model estimates using own and spousal retirement as dependent variables. The instrument used is a binary indicator on whether own (spouse) age is greater than the Early Retirement Age (interacted with year in Panel B). Controls include a second order polynomial in age, age-treatment interactions, total household income, household size, and whether dependent children live in the household. Robust standard errors in parentheses. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

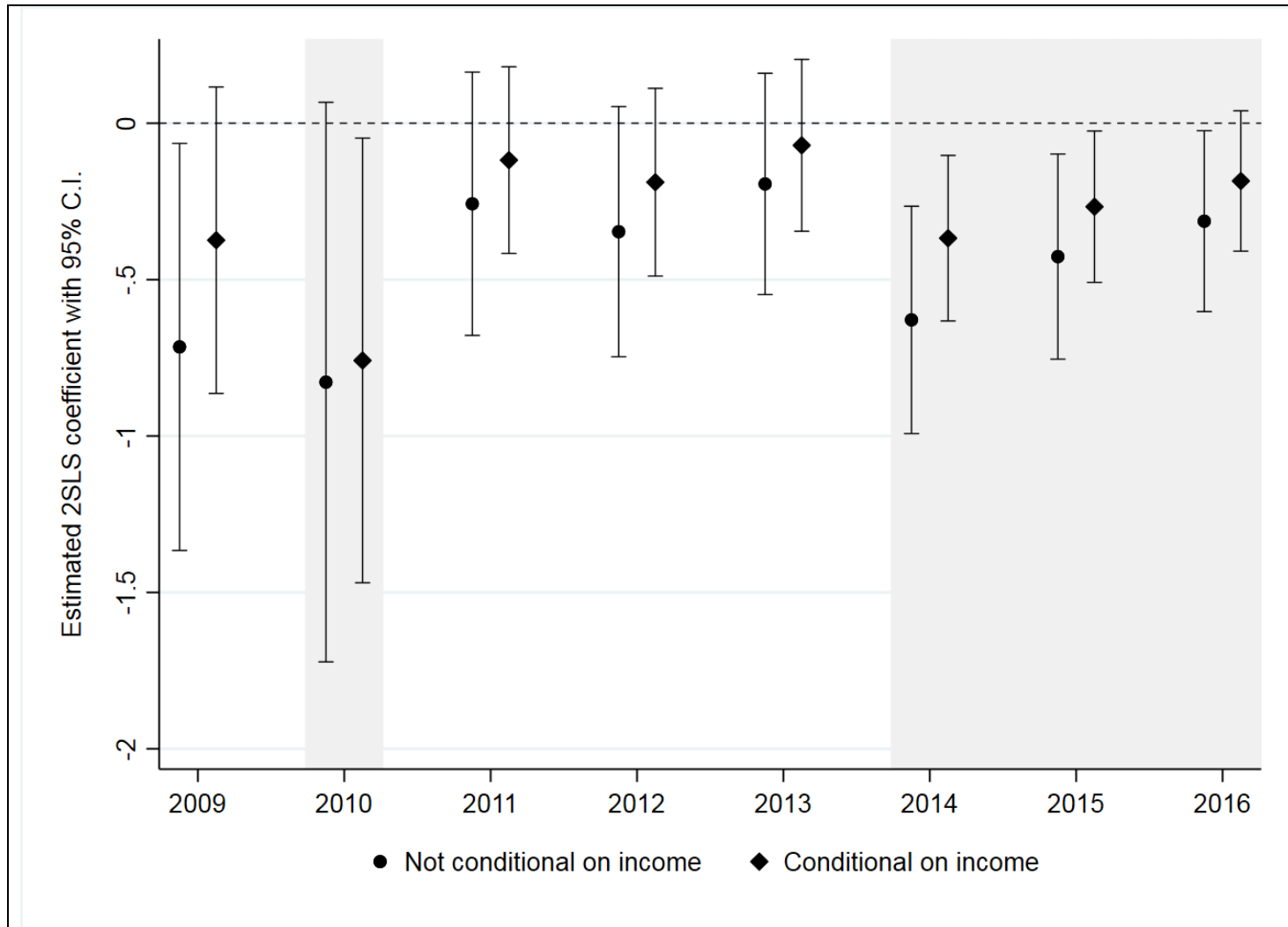
# Estimation results

**Table 3. Retirement and total expenditure.**

	Simple model		Interacted model	
	[1]	[2]	[3]	[4]
Retired	-.396*** (.128)	-.222** (.096)	-	-
Retired×Age	-.026 (.016)	-.029** (.012)	-.012 (.015)	-.016 (.012)
Spouse retired	.075 (.176)	.182 (.125)	-	-
Spouse retired×Age	-.026*** (.009)	.003 (.006)	-.027*** (.010)	.002 (.007)
Retired×2009	-	-	-.715** (.332)	-.374 (.250)
Retired×2010	-	-	-.828* (.456)	-.758** (.362)
Retired×2011	-	-	-.257 (.215)	-.118 (.152)
Retired×2012	-	-	-.347* (.204)	-.188 (.153)
Retired×2013	-	-	-.194 (.180)	-.071 (.140)
Retired×2014	-	-	-.629*** (.185)	-.367*** (.135)
Retired×2015	-	-	-.426** (.167)	-.267** (.123)
Retired×2016	-	-	-.313** (.148)	-.185* (.114)
Spouse retired×2009	-	-	.448 (.382)	.395 (.249)
Spouse retired×2010	-	-	.512 (.551)	.772* (.437)
Spouse retired×2011	-	-	-.231 (.282)	-.040 (.193)
Spouse retired×2012	-	-	-.070 (.291)	.056 (.213)
Spouse retired×2013	-	-	-.193 (.226)	-.003 (.170)
Spouse retired×2014	-	-	.190 (.218)	.246 (.159)
Spouse retired×2015	-	-	.048 (.227)	.221 (.164)
Spouse retired×2016	-	-	.022 (.183)	.110 (.134)
Total household income (ln)	-	.636*** (.013)	-	.636*** (.014)
Observations	6,883	6,883	6,883	6,883

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT). Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Estimation results



Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT). Notes: 2SLS estimates. 95% confidence intervals are based on robust standard errors. All parameters are obtained from models that include individual and household controls and year fixed effects.

# Estimation results

**Table 4. Retirement and expenditure categories: Estimates from the simple model.**

Expenditure category:	Retired [1]	Retired×Age [2]	Spouse retired [3]	Spouse retired×Age [4]	Household income [6]
Food & alcoholic beverages	.044 (.098)	-.017 (.013)	.219 (.143)	.011 (.007)	.242*** (.012)
Alcohol & tobacco	-.460 (.594)	-.178** (.077)	.787 (.922)	.013 (.047)	.641*** (.076)
Clothing & footwear	-1.453** (.623)	.006 (.082)	1.933** (.915)	.001 (.046)	1.379*** (.075)
Housing, water, electricity	-.107 (.096)	-.014 (.012)	.234* (.134)	-.010 (.007)	.567*** (.014)
Household equipment	-.285 (.393)	-.089* (.052)	1.015* (.563)	.018 (.028)	1.056*** (.051)
Health	1.078* (.568)	-.032 (.072)	-.580 (.757)	-.013 (.039)	.913*** (.074)
Transport	-.595 (.437)	-.111* (.057)	1.314* (.689)	.013 (.037)	1.391*** (.063)
Communications	-.365** (.142)	-.024 (.020)	.106 (.217)	-.015 (.011)	.643*** (.022)
Recreation & culture	-.211 (.356)	.005 (.046)	-.152 (.504)	-.030 (.025)	1.340*** (.043)
Restaurants & hotels	-.0242 (.441)	.031 (.057)	.515 (.669)	.008 (.032)	1.193*** (.058)

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS estimates. Sample size is 6,883 observations. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Estimation results

**Table 5. Head of household retirement and expenditure categories during the crisis.**

	Food & non- alcoholic beverages	Alcohol & tobacco	Clothing & footwear	Housing, water, electricity	Household equipment	Health	Transport	Communi- cations	Recreation & culture	Restaurants & hotels
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Retired×2009	.159 (.241)	-.279 (1.504)	-1.138 (1.371)	-.185 (.268)	.408 (.827)	-.324 (1.272)	-.415 (1.095)	-.683* (.366)	.124 (.807)	.488 (.960)
Retired×2010	-.157 (.331)	-1.446 (2.091)	-4.171* (2.386)	-.552 (.377)	-.624 (1.148)	2.536 (2.045)	-3.087 (1.943)	-.504 (.463)	-1.411 (1.102)	.583 (1.128)
Retired×2011	.009 (.160)	.287 (.892)	-1.287 (1.024)	-.144 (.147)	.166 (.592)	1.685* (1.013)	-1.236 (.823)	-.394 (.282)	-.341 (.543)	.392 (.597)
Retired×2012	.088 (.156)	-.471 (.921)	-1.627 (1.027)	-.065 (.125)	-.700 (.645)	1.369 (.863)	-1.526* (.878)	.039 (.207)	-.130 (.504)	-.919 (.681)
Retired×2013	.309** (.143)	.040 (.870)	-1.901* (.974)	.040 (.129)	.559 (.504)	.991 (.851)	.404 (.619)	-.192 (.195)	.213 (.669)	.474 (.538)
Retired×2014	-.183 (.142)	-1.702** (.854)	-1.089 (.843)	-.144 (.122)	-.399 (.581)	1.811** (.759)	-.857 (.643)	-.233 (.180)	-.947* (.564)	-.763 (.633)
Retired×2015	-.067 (.132)	-.832 (.824)	-2.008** (.922)	-.091 (.125)	-1.096* (.603)	1.327* (.767)	-.889 (.616)	-.433** (.179)	-.531 (.458)	-.619 (.670)
Retired×2016	.047 (.121)	-.260 (.769)	-1.140 (.798)	-.135 (.113)	-.017 (.485)	1.064 (.677)	-.118 (.494)	-.550*** (.193)	.147 (.415)	-.086 (.583)
Observations	6,883	6,883	6,883	6,883	6,883	6,883	6,883	6,883	6,883	6,883

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects.

Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.



# Estimation results

**Table 6. Impact of retirement on expenditure: Falsification tests.**

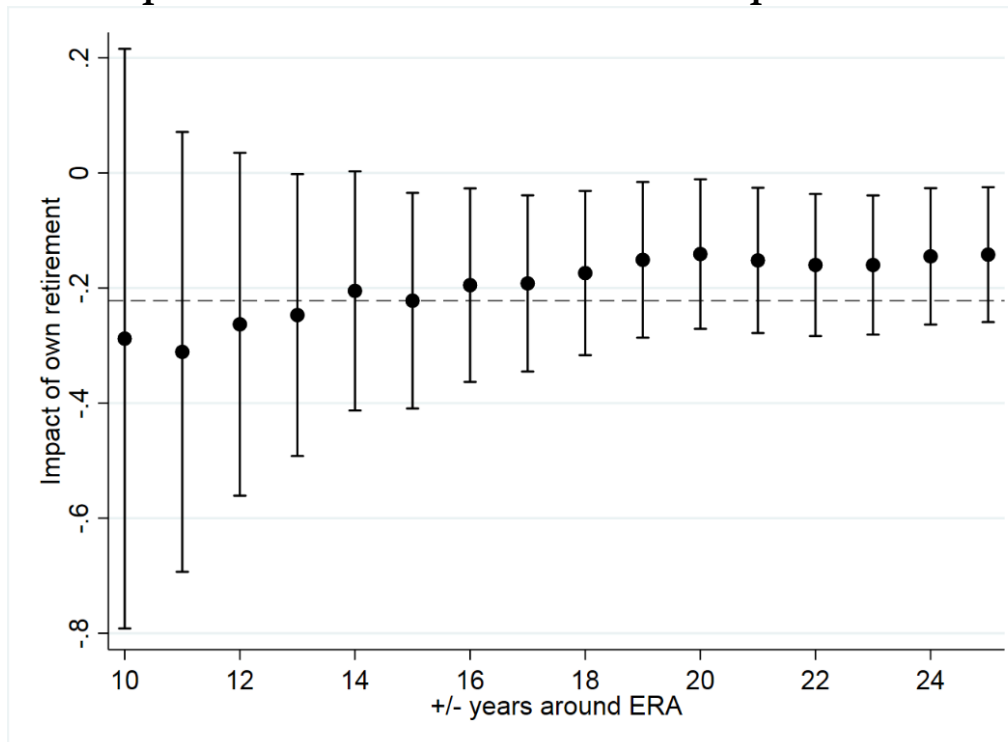
ERA specified at:	t-5	t-4	t-3	t-2	t-1	(Actual ERA) t-0
	[1]	[2]	[3]	[4]	[5]	[6]
Retired	.035 (.120)	.031 (.126)	-.083 (.103)	-.104 (.106)	-.112 (.094)	-.222** (.096)
Retired×Age	-.038** (.017)	-.041** (.017)	-.030** (.014)	-.029** (.014)	-.031** (.013)	-.029** (.012)
Spouse retired	.166* (.097)	.106 (.096)	.128 (.093)	.076 (.103)	.066 (.101)	.182 (.125)
Spouse retired×Age	.001 (.005)	.003 (.005)	.001 (.005)	-.000 (.005)	-.000 (.005)	.003 (.006)
Total household income (log)	.634*** (.013)	.637*** (.013)	.638*** (.013)	.641*** (.013)	.641*** (.013)	.636*** (.013)
Observations	6,883	6,883	6,883	6,883	6,883	6,883

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (ELSTAT).

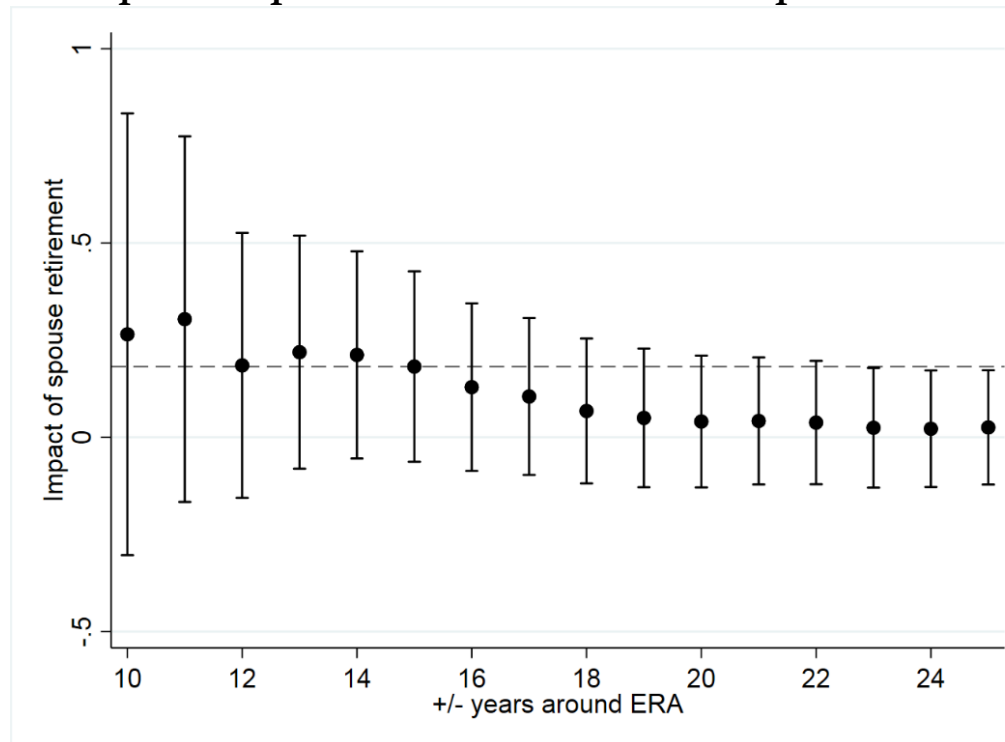
Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Estimation results

## Impact of own retirement on total expenditure



## Impact of spouse retirement on total expenditure



Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS coefficients with 95% confidence intervals based on standard errors corrected for clustering by household. Dashed horizontal lines represent the average baseline effects obtained when estimating the model using a +/- 15 years bandwidth around ERA. All models control for the usual set of individual and household characteristics and time fixed effects.

# Estimation results

**Table 7. Retirement and total expenditure: Changes in household composition.**

	[1]	[2]	[3]	[4]	[5]
Retired	-.257*** (.096)	-.222** (.096)	-.243** (.096)	-.226** (.095)	-.215** (.097)
Spouse retired	.148 (.126)	.182 (.125)	.150 (.125)	.182 (.125)	.198 (.129)
Total household income (ln)	.674*** (.013)	.636*** (.013)	.674*** (.013)	.635*** (.013)	.634*** (.013)
Household size	-	.063*** (.007)	-	.065*** (.007)	.058*** (.008)
Presence of dependent children	-	.088*** (.019)	-	.087*** (.019)	.090*** (.019)
Unemployed children in household	-	-	.050*** (.012)	-.013 (.012)	-.032* (.017)
Adult children in household	-	-	-	-	.027* (.016)

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects.

Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Estimation results

**Table 8. Retirement and total expenditure: Controlling for education.**

Outcome:	Primary or less education	Secondary education	Tertiary education	Total expenditure
	[1]	[2]	[3]	[4]
Retired	.261** (.107)	-.064 (.117)	-.196* (.105)	-.194** (.094)
Spouse retired	-.322** (.153)	.239 (.156)	.084 (.140)	.163 (.126)
Total household income (ln)	-.345*** (.014)	-.017 (.014)	.362*** (.013)	.593*** (.013)
Primary or less education	-	-	-	-
Secondary education	-	-	-	.043*** (.015)
Tertiary education	-	-	-	.121*** (.017)

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

# Estimation results

**Table 9. Retirement and total expenditure: Age difference.**

	Couples with low age difference (less than 5 years)	Couples with high age difference (more than 5 years)	Couples with low age difference (less than 5 years)	Couples with high age difference (more than 5 years)
	[1]	[2]	[3]	[4]
Retired	-.673** (.304)	-.285 (.460)	-.394* (.244)	-.284 (.348)
Retired×Age	-.071** (.031)	-.011 (.025)	-.044** (.022)	-.037* (.019)
Spouse retired	.622 (.591)	.579 (1.033)	.433 (.458)	-.190 (.897)
Spouse retired×Age	.032 (.033)	-.037 (.023)	.037 (.024)	-.017 (.017)
Control for income	No	No	Yes	Yes

Source: Household Budget Survey (2009-2016); Hellenic Statistical Authority (EL.STAT).

Notes: 2SLS estimates. Robust standard errors in parentheses. All models include individual and household controls and year fixed effects. Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level, respectively.

## Conclusions

- some first evidence on the retirement-expenditure puzzle in bad times
  - adverse economic conditions
  - implementation of pension cuts (and reforms)
- expenditure drops at retirement
  - part of it explained by changes in income
  - drop is greater when pension cuts were implemented
- gender asymmetries
  - spouse retirement is not significant
- work in progress:
  - wider time window: 2008-2017 data
    - ...plus the 2004 wave for some “good times” evidence
  - individual data on income, income source, insurance

# Retirement and Expenditure in Turbulent Times

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