

## Unhealthy retirement?

Fabrizio Mazzonna, University of Lugano

Franco Peracchi, EIEF and Tor Vergata University

Universit Paris-Dauphine

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- ▶ But they may decrease if retirement **negatively** affects lifestyle (Zantinge et al. 2013) and cognitive abilities (Rohwedder & Willis 2010).
- ▶ For example, retirement may reduce the incentive to invest in “cognitive repair” (Mazzonna & Peracchi 2012). A negative effect can also be predicted if retirement reduces **social interactions** (Börsch-Supan & Schuth 2013).

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  - ▶ Even simple comparison of the same individual over time might be wrong.

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  - ▶ Cross-country variation in pension eligibility is typically confined to **one point** in time (the time of interview).
  - ▶ Retirement is typically modelled as a **binary treatment** causing a one-time shift in the level of health or cognition.
- ▶ In Mazzonna and Peracchi (2012) we partially address these important empirical issues by estimating the causal effect of retirement on the **age profile** of cognitive abilities

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- ▶ We show evidence of substantial heterogeneity in the effect of retirement on health and cognition across occupations, thus showing that the two dissenting views about retirement can in fact **coexist**.
- ▶ In particular, we show that while the overall effect of retirement is negative, its effect vanishes and turns **positive** when focusing on people who were employed in more physically demanding jobs.



# Data

- From wave 1 and 2 of **SHARE**: a balanced sample of 8226 individuals from **10 European countries**, aged 50–70 at the time of the first interview (2004 or 2005), who classified themselves as employed, unemployed or retired, answered the retrospective question on past employment status, and reported being in the labor force at age 50.

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- ▶ Physical burden includes ergonomic stress and environmental pollution while the psycho-social includes mental stress, social stress and temporal loads.

# Sample size by country and gender

AT	Austria	344	329
BE	Belgium	765	501
CH	Switzerland	204	162
DE	Germany	508	413
DK	Denmark	385	349
ES	Spain	317	152
FR	France	531	496
IT	Italy	491	284
NL	Netherlands	491	273
SE	Sweden	580	654
Total		4614	3612

# Health and Cognitive outcomes in SHARE

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- ▶ The cognitive function (CF) module contains measures of cognitive abilities based on simple tests of **orientation in time**, **memory**, **verbal fluency** and **numeracy**.
- ▶ To summarize the information from the larger set of cognitive and health variables available in SHARE I will show you only results from two summary indices:
  - ▶ **Health index**: as in Coe and Zamarro (JHE 2011) we use the predicted probability of reporting good health using a large set of subjective and objective health variables (taking into account gender and country reporting heterogeneity).
  - ▶ **Cognitive index**: first principal component of the three cognitive test.
- ▶ In our paper we show the robustness of our results using:
  - ▶ **Depression**, **Self-rated health**, **Mobility limitations**
  - ▶ Three cognitive tests: **memory**, **verbal fluency** and **numeracy**



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- ▶ To evaluate the job characteristic that better explains the heterogeneity in the effect of retirement we also match occupations with the other external index that measures the **psycho-social** burden of the job.
- ▶ As robustness we also use an **internal index** based on respondents' self-evaluation of the physical burden of their job.

# Correlations between internal and external indices

Country	% external (physical)	% external (psycho-social)	% internal index
AT	51.9	58.3	53.5
BE	36.5	47.4	41.8
CH	30.0	49.1	37.1
DE	44.3	52.6	48.0
DK	44.4	51.6	50.5
ES	70.0	59.5	76.3
FR	40.7	46.5	41.9
IT	61.9	55.9	59.0
NL	43.4	60.7	47.6
SE	41.8	53.8	43.8
Total	45.2	52.8	47.7
Correlation		40.4	72.9
			39.9

# Estimated models

- Baseline model (Model A):

$$H_{it} = \alpha_0 + \alpha_1 Age_{it} + \alpha_2 Retired_{it} + \alpha_3 DistR_{it} + \beta_1^\top X_i + \beta_2^\top Z_{it} + U_{it}, \quad (1)$$

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where:

- ▶  $H_{it}$  is the health status of the  $i$ th individual at time  $t$  (wave 1 or 2).
- ▶  $Age_{it}$  is her current age,
- ▶  $Retired_{it}$  is a dummy for retirement,
- ▶  $DistR_{it} = \max\{0, Age_{it} - R_{it}\}$  is the number of years spent in retirement;
- ▶  $X_i$  consists of a set of time invariant characteristics (e.g. country and education);
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  - ▶  $U_{it}$  is a regression error potentially correlated with  $\text{DistR}_{it}$ .
- ▶ This model is estimated for the whole sample, and separated by **gender** or **job type** (less and more physically demanding).

# Endogeneity of retirement

- ▶ Potential correlation between  $R_i$  and  $U_i$  due to reverse causality or omitted variables.
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- ▶ we construct two set of instruments:
  - ▶ two dummies for being eligible for early or normal retirement benefit ( $EligE$  and  $EligN$ );

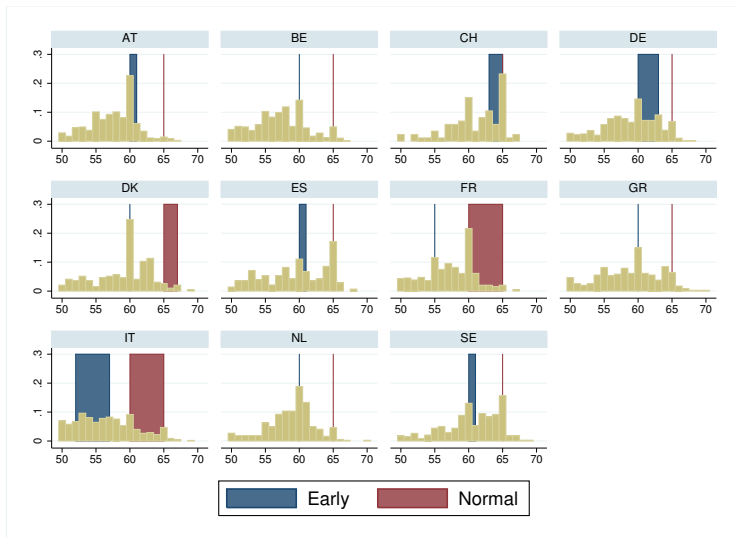
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  - ▶ two variables that count the distance from these eligibility ages,  $DistE_i = \max\{0, Age_i - E_i\}$  and  $DistN_i = \max\{0, Age_i - N_i\}$ .
- ▶ We have 2 endogenous variables and 4 instrument: Sargan-tests of overidentifying restrictions.

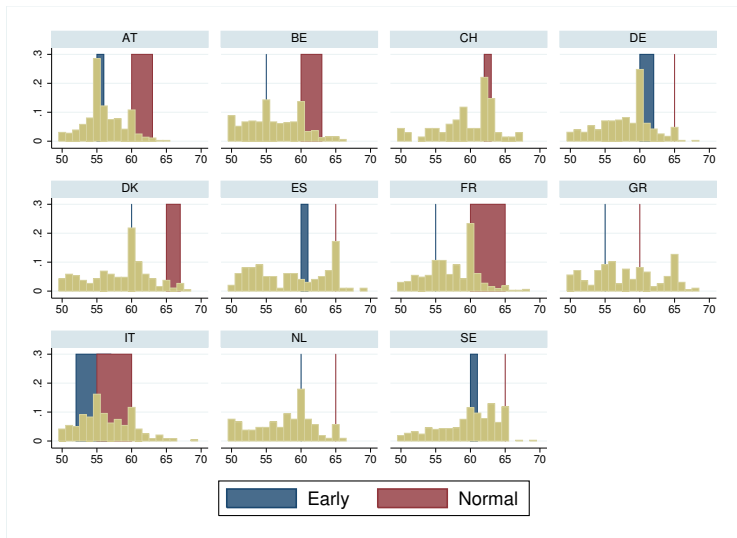
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- ▶ We have 2 endogenous variables and 4 instrument: Sargan-tests of overidentifying restrictions.
- ▶ Notice that in both waves, the value of  $DistR$  as of that of our instruments may vary across respondents of the same cohort and who retired in same date (year and month) because they were interviewed at different points in time.

# Pension eligibility ages for men



# Pension eligibility ages for women



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- ▶ Is the last job simply a proxy for lifelong exposure to strenuous work conditions?
- ▶ Endogeneity of occupational choices: health and type of job may be jointly determined.

# Results

- ▶ **First stage** results show that our instruments based on eligibility rules strongly predict **both** retirement status and years into retirement.
- ▶ Effect of retirement on health and cognition by gender:
  - ▶ Retirement increases the rate of health and cognitive **deterioration** (**long-run** effects)
  - ▶ **Short-term** of retirement are noisy and zero on average (heterogeneity?)
  - ▶ Effect on health are larger for **men**

## Effects of retirement by gender

	All		Men	Women
	A	B	B	B
Panel A: Good health				
DistR	-.009 *** (.002)	-.007 *** (.002)	-.010 *** (.003)	-.003 (.004)
Retired	.035 (.029)	.041 (.028)	.049 (.045)	.033 (.037)
J-test	2.809	2.436	2.536	5.401 *

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Panel B: Cognitive score				
DistR	-.056 *** (.014)	-.060 *** (.014)	-.069 *** (.018)	-.057 *** (.020)
Retired	.125 (.170)	.106 (.152)	.191 (.207)	.076 (.206)
J-test	.370	.455	.632	2.076
F	77.72	78.55	40.27	41.79
N	16012	16012	16012	16012

## Results by job

- ▶ Positive short-term of retirement on people working on physically demanding jobs.
- ▶ This effect is concentrated on people working on very strenuous jobs (category 7-10)
- ▶ The positive short term effects is long-lasting and might disappear only after 10 years or more.

# Effects of retirement by type of job

	Low (1-5)	High (6-10)	Very Low (1-3)	Median (4-6)	Very High (7-10)
Panel A: Good health					
DistR	-.006 * (.003)	-.007 * (.004)	-.006 (.004)	-.008 ** (.004)	-.005 (.004)
Retired	-.011 (.035)	.090 ** (.043)	-.029 (.037)	.055 (.044)	.095 * (.053)
J-test	2.640	.574	.216	3.104	1.713

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J-test	2.640	.574	.216	3.104	1.713
Panel B: Cognitive index					
DistR	-.053 *** (.019)	-.054 *** (.020)	-.075 *** (.022)	-.058 ** (.023)	-.046 ** (.023)
Retired	-.075 (.237)	.505 ** (.239)	-.035 (.244)	-.182 (.275)	.622 ** (.271)
J-test	1.142	.297	.062	1.574	1.261
F	41.398	36.673	24.073	27.350	28.885
N	8384	7092	4502	5600	5374

# Main robustness checks

- ▶ No evidence of similar heterogeneity when using the psycho-social index.
- ▶ Model specification: age dummies and quadratic specification
- ▶ attrition: IPW
- ▶ country heterogeneity

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# Conclusions

- ▶ Overall, retirement appears to have a negative effect on the age profile of health and cognitive abilities.
- ▶ However, we found evidence of substantial heterogeneity in the effects of retirement across jobs.
- ▶ People working in more physically demanding jobs experience positive short run-effect of retirement on both health and cognition.
- ▶ In designing pension policies, need to take special care of these people.

# Descriptive statistics

Variable	Mean(W1)	Mean (W2)	Diff.
(Predicted) good health	.805 (0.002)	.791 (0.002)	-.0148 ***
Cognitive index	-.057 (0.014)	.057 (0.015)	.114 ***

# Attrition

	Low (1-5)		High (6-10)	
	Unweighted	Weighted	Unweighted	Weighted
Not depressed				
DistR	-.013 * (.007)	-.013 * (.007)	-.008 (.010)	-.009 (.011)
Retired	-.183 ** (.085)	-.197 ** (.083)	.197 (.127)	.233 * (.129)
Memory				
DistR	-.048 (.063)	-.071 (.065)	-.016 (.071)	-.019 (.073)
Retired	-.093 (.775)	-.299 (.752)	1.343 (.854)	1.492 * (.873)
<i>N</i>	8310	8310	7062	7062
<i>F</i>	27.788	27.161	25.199	23.397

# Occupation

Age	-.010 ** (.004)
<i>DistE</i>	.000 (.004)
<i>DistN</i>	.006 (.004)
<i>EligE</i>	.013 (.019)
<i>EligN</i>	.030 (.021)
Low educ	.357 *** (.011)
<i>N</i>	7893