L'impact causal du passage à la retraite sur le poids des seniors : les résultats de l'enquête SHARE.

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Context

- Obesity rates in the world have more than doubled over the last 30 years (WHO, 2012).
- Risk factor for numerous highly-prevalent and costly diseases, reduces the quality of life, shortens life expectancy...
- In the EU-27, approximately 60% of the adult population -260 millions of adults- is either overweight (BMI from 25 to 29.9 kg/m^2) or obese (BMI 30 kg/m^2 and above).

Context

- Obesity rates in Europe reach their peak around age 60.5 (ECHP 1998-2001).
- Particularly strong effect of increased BMI -regardless of obesity status- overweight, obesity on morbidity and disability among adults aged 50 and older.
- Obesity-related costs among this ageing population are considerable.

Motivation

- Objective : understand the causes of obesity, overweight and weight change among the elderly.
- High job-exit rates and steep decline in labour force participation rates in European countries after the age of 50.
- Do transitions out of employment affect weight ?
- Focus on the most common exit of the labour force :
  - Retirement

Retirement and weight : Potential mechanisms

- Theoritical and empirical findings consistent with the fact the retirement induces health-producing activities (increased physical activity and healthier diet).
- Although it is also likely to trigger a loss of structured time, isolation and depression, addictive behaviours...
- Direct reduction in job-related exercise.
  - The effect of retirement may depend on one's former occupation (strenuous job or not).

Identification issues

- Not so easy to measure a causal effect here.
- Identification issue due to selection on unobservables and reverse causality.
  - Retirement is often a choice, based on unobservables characteristics correlated with weight (time preference, health or psychological deteriorations).
  - Overweight and obese individuals are on average paid less, less promoted and more likely to seek early retirement benefits (see Burkhauser and Cawley (2006) for the US). Their incentives to retire may thus be higher.

What we do

- In this paper, we estimate the causal impact of retirement on BMI, the probablity of being either overweight or obese and the probability of being obese.
- We use the 2004, 2006 and 2010 waves of SHARE (Survey of Health, Ageing and Retirement in Europe).
- IV approach : we exploit the European variation in early retirement schemes and the stepwise increase in early retirement ages to produce an exogeneous shock on retirement behaviour.

Related literature (very briefly)

- Literature on the effects of retirement on weight :
  - Most studies do not adress the endogeneous nature of retirement and use US data :
    - Results quite consistent so far (Nooyens et al., 2005; Forman-Hoffman et al. 2008; Gueorguiva et al. 2009).
  - IV studies :
    - Chung et al. (2009) use IV methods and US data and conclude that retirement leads to a modest weight gain, 0.24 BMI units on average.
    - Goldman et al. (2008) use the same data, same IV method and conclude that males retiring from strenuous job gain weight while those retiring from sedentary lose it.

Our paper

- We identify a causal impact where most studies measure a mere correlation.
- First results on European data
  - Not clear whether results for the US should hold for Europe given the differences in term of labour markets, social security schemes and social policies.
- Explores the effect of retirement on weight for a wide range of ages, not just ages 62 and 65 in US studies.
  - Weaker assumptions in terms of weight trajectories by cohort and age are needed in this framework.
- Sheds light on an important underlying mechanism by which retirement affects health.
- Important policy implication.

Pooled OLS and pooled probit models

- We investigate the impact of retirement on BMI, the probability of being overweight or obese and the probability of being obese.
- As a first step, we pool the observations and estimate the following equation by pooled OLS or pooled probit :

$$Y_{it} = \alpha + \gamma R_{it} + X_{it}\beta + D_t + D_i + u_{it}$$

- The POLS estimate of γ is inconsistent if retirement status R_{it} is correlated with the error term u_{it}.

Fixed-Effect models

- Estimate instead the following equation by a fixed-effect model :

$$Y_{it} = \alpha + \gamma R_{it} + K_{it}\beta + \delta_t + \alpha_i + v_{it}$$

- Allows regressors to be endogeneous, provided that they are correlated only with α_i, the time-invariant component of the error, but not with the idiosyncratic error v_{it}.
- If R_{it} is correlated with time-varying characteristics however, $\hat{\gamma}$ is still biased.
- Moreover, reverse causality is still a concern.
- IV strategy.

Retirement decisions in industrialised countries

- The Earliest Retirement Age (ERA) at which individuals are entitled to pension benefits (either reduced pensions or full pensions -conditional on a sufficient number of years of social security contributions) exerts a powerful influence to their retirement behaviour (Gruber and Wise (1999)).
- Official Retirement Age (ORA) : age at which workers are entitled to either minimum-guaranteed pensions or full old-age pensions irrespective of their work history.
  - Typically less important in predicting retirement than the Earliest Retirement Age (ERA) (Gruber and Wise (1999)).

Instrument

We instrument the retirement status R_{it} by a dummy variable indicating whether individual i's age is above or below the earliest retirement age in his country c at time t. Let age_{it} be individual i's age at time t and ERA_{ct} the ERA in i's country c at time t. Our instrument is defined as :

$$Z_{ict} = 1_{\{age_{it} > ERA_{ct}\}}$$

Retirement decisions in industrialized countries

Table 1 : O cial (ORA), Earliest (ERA) and E ective retirement ages, proportion of individuals retired below and above the ERA and proportion of individuals retiring when reaching the ERA across waves.

Country	O cial retirement ages		Earliest retirement ages		E ective retirement ages		% of retired below ERA	% of retired above ERA	% of individuals retiring when reaching ERA across waves
	Men (1)	Wom (2)	Men (3)	Wom (4)	Men (5)	Wom (6)	(7)	(8)	(9)
Austria	65	60	62	57[a]	57.5	55.9	33.0	76.5	26.8
Belgium	65	63	60	60	57.5	57.7	21.1	81.6	34.3
France	65	65	60	60	56.9	58.3	17.0	88.0	44.5
Germany	65	65	63	60	59.9	58.7	11.5	79.9	38.6
Italy	65	60	57[b]	57[b]	57.9	57.7	17.6	81.0	27.0
Spain	65	65	61	61	61.4	59.7	8.9	68.9	21.6
Sweden	65	65	61	61	61.4	61.8	6.5	50.7	19.4
Switzerland	65	64	63	62	61.4	60.9	5.4	65.4	39.0

[a] Austria implemented a stepwise increase in women's ERA from age 57 in 2004 to age 59 in 2010-2011.

[b] Italy implemented a stepwise increase in the ERA from age 57 in 2004 to age 59.5 in 2010-2011.

Exclusion restrictions

- Once controlling for age, reaching the national ERA is unlikely to be correlated with weight except through the increased probability of retiring.
  - holds if we assume that age does not have a discontinuous effect on weight trajectories at different ERA in different countries.
- Existence of other ways to exit the labour force, e.g through unemployment or disability programmes.
  - to the extent that these patterns are stable within countries between two subsequent waves of the survey, the individual fixed-effect wil pick up this variation and will not bias our results.

The SHARE database

- We use the 2004, 2006 and 2010 waves of the Survey of Health, Ageing and Retirement in Europe (SHARE).
- SHARE : a European cross-national panel database of micro-data on health, socio-economic status and retirement.
- More than 85,000 individuals over 50 years old and their spouses-partners (independant of their age) from 19 European countries.

Our sample

- Our sample :
  - All individuals interviewed in waves 2004, 2006 and 2010 (balanced panel).
  - Individuals aged 50-69 years old.
  - Who declared in each wave being either employed or retired in each wave.
    - transitions from employment to unemployment, invalidity or inactivity are thus excluded.
  - Denmark and the Netherlands are excluded (early retirement schemes inexistent or abolished).
  - Unique sample with non missing values.
- Overall, 2493 individuals from 8 countries (Austria, Germany, Sweden, Spain, Italy, France, Switzerland and Belgium) across the three waves.

Retirement definition

- Retirement definition using self-declared current job situation :
  - Anyone who declares herself as retired is considered as retired, whether she has been or not -even for a few hours- in a paid job during the month preceding the interview.
  - Conversely, anyone who declares herself to be employed or self-employed is considered as currently working.
- More restrictive definition of retirement :
  (i) self-declared current job situation is "retired" (ii) did not do any paid work during the month preceding the interview.

Weight measures

- Body Mass Index : self-declared weight in kilograms divided by the square of the self-declared height in meters (kg/m^2).
- Clinical weight categories : underweight (BMI under 18.5 kg/m^2), normal (BMI from 18.5 to 24.9 kg/m^2), overweight (BMI from 25 to 29.9kg/m^2) and obese (BMI 30 kg/m^2 and above)

Covariates

- Age, age squared, marital status, gender, education, occupation, country and time dummies.
- Health variables in some specification (self-assessed health on a five-point scale, Euro-D depression index).
- We supplement our database with ERA in force in each country at the time of the survey.

Pooled OLS, pooled probit and FE results

- Pooled OLS and pooled probit :
  - Positive and significant association between retirement and BMI for both men and women.
  - Increases the probability of being overweight for men and obese for women.
- FE results :
  - Retirement is no longer associated with weight outcomes for men.
  - Retirement leads to BMI gain and increases the probability of being obese for women.

First stage regression

Table 8 : Impact of being above the Earliest Retirement Age (ERA) on retirement status.

	Retired	
	Men	Women
	(1)	(2)
Above the ERA	.203***	.275***
	(.019)	(.021)
Age	-.059*	-.146***
	(.031)	(.031)
Age squared	.001**	.001***
	(.000)	(.000)
Time dummy for 2006	.054	.042
	(.045)	(.046)
Time dummy for 2010	.202	.154
	(.129)	(.134)
Lives with spouse-partner	.012	.020
	(.040)	(.037)
R-squared	0.30	0.34
F-Stat of excluded instruments	117.87	169.26
Observations	4059	3420

Second-stage results for men

Table 9 : Second-stage results for men : the causal impact of retirement on BMI, the probablility of being overweight or obese and the probability of being obese.

	BMI		Overweight or Obese (BMI 25)		Obese (BMI 30)	
	(1)	(2)	(3)	(4)	(5)	(6)
Retirement	.240	.211	.035	.031	.102*	.102*
	(.456)	(.456)	(.075)	(.075)	(.061)	(.061)
Age	.388	.378	.092***	.090***	.015	.014
	(.197)	(.197)	(.032)	(.032)	(.022)	(.022)
Age squared	-.002	-.002	-.001***	-.001***	.000	.000
	(.001)	(.001)	(.0002)	(.0002)	(.000)	(.000)
Time dummy for 2006	-.228	-.245	-.013	-.015	-.017	-.019
	(.236)	(.236)	(.041)	(.042)	(.029)	(.029)
Time dummy for 2010	-.568	-.573	-.020	-.021	-.098	-.100
	(.674)	(.673)	(.120)	(.120)	(.085)	(.085)
Lives with spouse-partner	-.221	-.231	-.065	-.066	-.014	-.014
	(.205)	(.201)	(.043)	(.041)	(.029)	(.029)
Health variables	no	yes	no	yes	no	yes
Observations	4059	4059	4059	4059	4059	4059

Second-stage results for women

Table 10 : Second-stage results for women : the causal impact of retirement on BMI, the probablility of being overweight or obese and the probability of being obese.

	BMI		Overweight or Obese (BMI 25)		Obese (BMI 30)	
	(1)	(2)	(3)	(4)	(5)	(6)
Retirement	.259	.313	-.003	.003	.020	.024
	(.361)	(.359)	(.057)	(.057)	(.044)	(.014)
Age	.176	.197	.013	.015	-.018	-.017
	(.193)	(.191)	(.031)	(.031)	(.024)	(.024)
Age squared	-.002	-.002	.000	.000	.000	.000
	(.001)	(.001)	(.000)	(.000)	(.000)	(.000)
Time dummy for 2006	.367	.293	.062	.057	.035	.030
	(.286)	(.283)	(.042)	(.042)	(.034)	(.033)
Time dummy for 2010	.544	.362	.127	.115	.060	.046
	(.822)	(.818)	(.124)	(.124)	(.098)	(.098)
Lives with spouse-partner	.439**	.318	.022	.018	-.002	-.012
	(.215)	(.217)	(.031)	(.031)	(.031)	(.031)
Health variables	no	yes	no	yes	no	yes
Observations	3420	3420	3420	3420	3420	3420

Second-stage results for men and women by occupation type

Table 11 : Second-stage results for men and women : the impact of retirement by occupation type (strenuous/sedentary).

	BMI		Overweight or Obese (BMI 25)		Obese (BMI 30)	
	Men (1)	Women (2)	Men (3)	Women (4)	Men (5)	Women (6)
Retirement	-.086	.754	.026	.023	.103	.103
	(.911)	(.739)	(.141)	(.125)	(.117)	(.092)
Retirement*strenuous occupation before retirement	.492	.109	.011	-.093	.110**	-.017
	(.373)	(.358)	(.058)	(.061)	(.044)	(.046)
Age	.391	.593	.096	-.020	.088	.078
	(.753)	(.621)	(.104)	(.109)	(088)	(.024)
Age squared	-.002	-.006	.001	.000	.001	.000
	(.006)	(.005)	(.001)	(.001)	(.001)	(.001)
Time dummy for 2006	-.296	.351	-.010	.081	-.054	.013
	(.444)	(.390)	(.065)	(.042)	(.059)	(.043)
Time dummy for 2010	-.577	.471	-.010	.188	-.181	-.022
	(1.22)	(1.088)	(.181)	(.167)	(.098)	(.123)
Lives with spouse-partner	-.023	.525**	-.039	-.020	.008	.003
	(.260)	(.236)	(.054)	(.032)	(.039)	(.036)
Observations	2802	2424	2802	2424	2802	2424

Main findings 1/2

- Our results show that retirement induced by social security rules causes a 0.11 percentage point increase in the probability of being obese within a two to four-year period among the 50-69 year-old men having retired from strenuous jobs.
- No effects are found for women, nor for men having retired from sedentary jobs.
- The retirement impact on weight is likely to be driven by a direct reduction in job-related exercise.
- Gender-heterogeneity of our results probably best explained by different patterns in terms of leisure-time physical activity after retirement.

Main findings 2/2

- Instantaneous effect of retirement on weight (in a two to four-year period).
- Effect at the right-hand side of the distribution : no effect on BMI and the risk of being overweight.
  - Insight : Our results show that the effect is only significant for those individuals who had a BMI superior to 24 at baseline,
  - Triggerring effect of retirement on weight for people already at risk of obesity ?

Robustness checks

- Robustness check at BMI threshold 31.
- Linear, quadratic (presented) and quartic age terms to control properly for the age trend.
- Exclusion of underweight individuals.
- age*country and age^2*country terms as additional controls.

Discussion and comments

- BMI does not take into account body composition. Further waves of SHARE include a measure of weight circumference !
- Our results do not necessaraly generalise to other transitions out of employment (unemployment, disability, inactivity etc.).
- Long-term effects of retirement on weight ?
- Contributes to the long-standing debate on retirement and health by exploring an important underlying mechanism.

Merci de votre attention !