Exploring the role of health in Early Retirement by occupational status: looking for the causes of the greying of the self-employed sector

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Motivation

- Labour force participation of the elderly: Life expectancy, early retirement (generalised during the crisis) and the sustainability of the pension systems.

- Leaving aside macroeconomic factors, the health should play a key role on the retirement behaviour.

- Some key questions about this relationship:

Motivation

- Why individuals choose to make an early transition to retirement while others decide to enlarge their working lives?

- Are the health state the main factors behind these decisions or are some economic conditions or strategic decisions in order to achieve a perpetual income relegating to the background the role of factors such as health or job satisfaction?

- What are the combined effects of greater life expectancy and earlier retirements, not only for ensuring the long-term viability of the public pension system, but also for reassessing the affordability of early retirement in order to keep an adequate standard of living?

Motivation

- Greater longevity + earlier retirements : Need to rethink

- The answers to this new scenario during the Great Recession are well known. Older wage workers, in order to combat unemployment and their lower employability, have used early retirement as an strategic way to combat unemployment situations and achieve a perpetual income, after some spells of unemployment perceiving benefits. Even some of them have experienced some brief transitions to paid employment or self-employment for achieving the retirement as late as possible

Early retirement and self-employment

- Some self-employed will have an incentive to enlarge their working lives if the opportunity cost of this activity is high. Then, this group of workers won't decide to switch to retirement if the utility associated with this self-employment exceeds the one of an equivalent retirement position.

- By contrast, if as a result of a crisis, the prospects of income from retirement are higher than into self-employment individuals will have a stimulus for abandoning this activity

Previous literature and the gap

- In the decision of retirement health conditions might play a key role. what are the health impacts of retirement?

- Is the health state or its self-perception a key element for determining the decision of an early retirement?

- If yes, the job satisfaction could be considered as a key factor in the retirement decision.

The gap

- These questions have been intensively explored by previous literature in Health and Labour Economics

- Literature on job satisfaction provides finings pointing to a higher job satisfaction associated to certain types of employments by status. In particular, this brand of literature provides robust results supporting that self-employed workers are more satisfied than wage workers, and as a result one could expect that the self-perceived health state being higher for self-employed workers than for wage workers.

- As a result the expected effect should be a larger working life of self-employees with regard paid-employees.

Early retirement and self-employment

- Are higher self-perceived job associated to a better health state or whether, by contrast the higher happiness placed in the entrepreneurial activities are more related to other circumstances more close to strategic economic decisions taken with the aim to maximize the permanent income.

- This work revisits the relationship between job satisfaction and health, analysing it now from a new perspective not explored yet: by distinguishing and exploring how the differences in the employment status can be also behind this perception of the overall state of health, treating of disentangle happiness and the real state of health, given the influence of the type of work on this perception.

Outline

- Methodology and Data
- Results
- Conclusions
- Avenues for further research

Methodology & Data (i)

- **DATA**
  - European Community Household Panel covering the period 1994-2001
  - Geographic coverage: 15 European countries
  - The target population of the ECHP consists of people living in private households in the national territory of each country. This panel offers information on 60,500 nationally representative households, which includes approximately 130,000 individuals aged 16 years and older.
  - Issues relating to demographics, labour market characteristics, income, and living conditions
  - Time coverage: 1994-2001
- **SAMPLE**
  - men and women aged 50 to 65 who are self-employed (either with or without employees) or paid employees for some particular period at least 15 hours per week.
    - – Self-employed (22721 observations, 6657 individuals)
    - – Paid-employee (44176 observations, 14027 individuals)

- **EMPIRICAL FRAMEWORK**
  - Competing Risks (survival models with discrete durations)

Methodology (ii)

DEPENDENT VARIABLES

- Duration as self-employed worker (non ordered discrete variable)
  - Values:
    - 0 the elderly survive into self-employment (or censored data)
    - 1 the elderly exits to early retirement
    - 2 the elderly exits to other inactivity
    - 3 the elderly exits to unemployment
    - 4 the elderly exits to paid-employment

- Duration as paid-employee(non ordered discrete variable)
  - Values:
    - 0 the elderly survive into paid-employment (or censored data)
    - 1 the elderly exits to early retirement
    - 2 the elderly exits to other inactivity
    - 3 the elderly exits to unemployment
    - 4 the elderly exits to self-employment

Methodology (iii)

MAIN INDEPENDENT VARIABLES (Main predictors, health)

- Health status (self-reported) (1-5)
  - Very good
  - Good
  - Fair
  - Bad
  - very bad

- Health limitations (1-3)
  - 1 No
  - 2 Yes, to some extent
  - 3 Yes, severely
- Hospital admission as in-patient
  - Admitted as an in patient during last 12 months or not (0-1) (ref.)

Methodology (iv)

CONTROL VARIABLES

- *Demographics*
  – Female (0-1)
  – Age 50-54, 55-59 and >50
  – Cohabiting (0-1)
  – Children under 14 (0-1)

- Educational attainment
  – Basic education (0-1) (ref.)
  – Secondary education (0-1)
  – Tertiary education (0-1)

- Economic situation
  – Ability to make ends meet (1-6)

- National Unmployment rate

- *Job related aspects*
  - Business sector (17 categories; *ref*. Construction)
  - Working hours
  - Own-account worker
  - Number of employees

- *Country dummies* (13 categories)

- *Duration dependence*
  - *Ln (duration as self-employed)*
  - *Ln (durationas paid-employee)*

Main Results (i) Average marginal effects on probability of survival into self or Paid employment
From self-employment >50 years
From Paid-employment > 50 years

From self-employment >50 years

Specification		I		II		III	
Predicted probability (y)		0,9132		0,9132		0,9132	
Independent variables (x)		$\frac{dy/dx}{y}$ % a	t-stat.	$\frac{dy/dx}{y}$ % a	t-stat.	$\frac{dy/dx}{y}$ % a	t-stat.
Main predictors: Health							
Health status (1-5)		-1.49	-5.60 ***				
Health limitations (1-3)				-1.62	-3.95 ***		
Hospital admission as in-patient (0-1)						-2.86	-3.99 ***
Demographic characteristics							
Female (0-1)		-3.98	-6.72 ***	-4.18	-7.01***	-4.26	-7.10***
Age 50-54 (*ref.*) (0-1)							
Age 55-59 (0-1)		-5.59	-10.56 ***	-5.66	-10.71***	-5.70	-10.82***
Age >60 (0-1)		-8.62	-11.26 ***	-8.82	-11.46***	-8.90	-11.52***
Cohabiting (0-1)		-0.50	-0.81	-0.49	-0.80	-0.52	-0.85
Children under 14 (0-1)		0.72	1.09	0.81	1.22	0.79	1.20
Educational attainment							
Basic education (*ref.*) (0-1)							
Secondary education (0-1)		0.13	0.21	0.24	0.39	0.23	0.37
Tertiary education (0-1)		0.16	0.19	0.33	0.39	0.31	0.36
Job related aspects							
Weekly working hours 15-39 (*ref.*) (0-1)							
Weekly working hours 40-49 (0-1)		3.31	4.53 ***	3.39	4.64***	3.55	4.85***
Weekly working hours 50-59 (0-1)		5.81	7.77 ***	5.84	7.80***	6.01	8.00***
Weekly working hours > 60 (0-1)		6.38	8.91 ***	6.42	8.97***	6.55	9.11***
Own account worker (*ref.*)							
Number of regular employees in local unit 1-4 (0-1)		1.32	2.78 ***	1.38	2.91***	1.44	3.03***
Number of regular employees in local unit 5-19 (0-1)		0.25	0.27	0.34	0.37	0.44	0.48
Number of regular employees in local unit >20 (0-1)		-1.46	-0.95	-1.49	-0.97	-1.28	-0.84
Economic situation							
Ability to make ends meet (1-6)		0.37	1.84 *	0.46	2.36**	0.56	2.88***
National unemployment rate		-0.98	-8.48 ***	-0.96	-8.29***	-0.98	-8.47***
Duration dependence							
Ln (duration as self-employed)		3.47	11.33 ***	3.48	11.37***	3.51	11.46***
Business sector dummies (18 categories; *ref.* Construction)		Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)		Yes		Yes		Yes	
Number of observations		22,721		22,721		22,721	
Log pseudolikelihood		-7,967.3		-7,966.9		-7,998.5	

Notes: a Average marginal effects expressed in relative terms with respect to predicted probabilities.
* 0.1 > *p* ≥ 0.05; ** 0.05 > *p* ≥ 0.01; *** *p* < 0.01.

From Paid-employment > 50 years

Specification		I		II		III	
Predicted probability (y)		0.9067		0.9067		0.9067	
Independent variables (x)		$\frac{dy/dx}{y}$ % a	t-stat.	$\frac{dy/dx}{y}$ % a	t-stat.	$\frac{dy/dx}{y}$ % a	t-stat.
Main predictors: Health							
Health status (1-5)		-2.05	-10.37 ***				
Health limitations (1-3)				-3.09	-10.92 ***		
Hospital admission as in-patient (0-1)						-3.02	-5.71 ***
Demographic characteristics							
Female (0-1)		-1.94	-4.89 ***	-2.06	-5.18 ***	-2.21	-5.51 ***
Age 50-54 (*ref.*) (0-1)							
Age 55-59 (0-1)		-7.35	-19.86 ***	-7.37	-19.96 ***	-7.51	-20.19 ***
Age >60 (0-1)		-13.42	-18.83 ***	-13.51	-18.95 ***	-13.76	-19.23 ***
Cohabiting (0-1)		-0.30	-0.69	-0.35	-0.8	-0.28	-0.64
Children under 14 (0-1)		0.85	1.61	0.91	1.74 *	0.90	1.71 *
Educational attainment							
Basic education (*ref.*) (0-1)							
Secondary education (0-1)		0.15	0.37	0.17	0.42	0.33	0.8
Tertiary education (0-1)		0.92	1.92 *	1.01	2.1 **	1.23	2.59 ***
Job related aspects							
Weekly working hours 15-39 (*ref.*) (0-1)							
Weekly working hours 40-49 (0-1)		0.71	1.95 *	0.68	1.85 *	0.76	2.06 **
Weekly working hours 50-59 (0-1)		1.87	3.04 ***	1.86	3.01***	1.95	3.15 ***
Weekly working hours > 60 (0-1)		-1.34	-1.77 *	-1.42	-1.88 *	-1.31	-1.73 *
Number of regular employees in local unit 1-4 (*ref.*) (0-1)							
Number of regular employees in local unit 5-19 (0-1)		2.35	4.38 ***	2.38	4.45 ***	2.36	4.41 ***
Number of regular employees in local unit >20 (0-1)		3.60	7.59 ***	3.64	7.67 ***	3.61	7.63 ***
Economic situation							
Ability to make ends meet (1-6)		-0.17	-1.14	-0.08	-0.55	0.04	0.31
National unemployment rate		-0.78	-8.30 ***	-0.77	-8.23 ***	-0.77	-8.22 ***
Duration dependence							
Ln (duration as paid employee)							
Business sector dummies (18 categories; *ref.* Construction)		Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)		Yes		Yes		Yes	
Number of observations		44,176		44,176		44,176	
Log pseudolikelihood		-16,763.7		-16,751.3		-16,807.1	

Notes: a Average marginal effects expressed in relative terms with respect to predicted probabilities.
* 0.1 > *p* ≥ 0.05; ** 0.05 > *p* ≥ 0.01; *** *p* < 0.01.

Main Results (ii) Average marginal effects on probability of exiting to early retirement

From self-employment >50 years

Specification	I $\frac{dy/dx}{y}$ %	I t-stat.	II $\frac{dy/dx}{y}$ %	II t-stat.	III $\frac{dy/dx}{y}$ %	III t-stat.
Predicted probability (y)	0.0272		0.0272		0.0272	
Independent variables (x)						
Main predictors: Health						
Health status (1-5)	32.53	6.24 ***				
Health limitations (1-3)			49.03	7.43 ***		
Hospital admission as in-patient (0-1)					33.49	2.56 **
Demographic characteristics						
Female (0-1)	-7.04	-0.73	-5.07	-0.52	-4.62	-0.47
Age 50-54 (ref.) (0-1)						
Age 55-59 (0-1)	91.80	10.32 ***	91.94	10.38 ***	93.87	10.50 ***
Age >60 (0-1)	187.96	10.50 ***	192.44	10.61 ***	195.43	10.62 ***
Cohabiting (0-1)	0.93	0.08	0.50	0.04	1.08	0.09
Children under 14 (0-1)	2.57	0.18	-0.07	-0.01	1.22	0.09
Educational attainment						
Basic education (ref.) (0-1)						
Secondary education (0-1)	-7.84	-0.71	-8.60	-0.78	-9.52	-0.87
Tertiary education (0-1)	-10.90	-0.61	-13.44	-0.78	-15.30	-0.90
Job related aspects						
Weekly working hours 15-39 (ref.) (0-1)						
Weekly working hours 40-49 (0-1)	-61.57	-4.15 ***	-61.10	-4.13 ***	-68.13	-4.49 ***
Weekly working hours 50-59 (0-1)	-78.20	-5.18 ***	-77.26	-5.13 ***	-84.27	-5.46 ***
Weekly working hours > 60 (0-1)	-63.27	-4.24 ***	-62.93	-4.25 ***	-68.95	-4.51 ***
Own account worker (ref.)						
Number of regular employees in local unit 1-4 (0-1)	-26.97	-2.95 ***	-27.29	-2.99 ***	-28.58	-3.14 ***
Number of regular employees in local unit 5-19 (0-1)	-56.76	-4.02 ***	-57.59	-4.12 ***	-60.99	-4.49 ***
Number of regular employees in local unit >20 (0-1)	15.88	0.49	18.49	0.56	13.33	0.41
Economic situation						
Ability to make ends meet (1-6)	8.93	2.43 **	7.59	2.08 **	4.69	1.30
National unemployment rate	11.32	4.51 ***	10.70	4.30 ***	11.09	4.43 ***
Duration dependence						
Ln (duration as self-employed)	-5.10	-0.79	-5.60	-0.87	-6.19	-0.95
Business sector dummies (18 categories; ref. Construction)	Yes		Yes		Yes	
Country dummies (13 categories; ref. Spain)	Yes		Yes		Yes	
Number of observations	22,721		22,721		22,721	
Number of completed spells	656		656		656	
Log pseudolikelihood	-7,967.3		-7,966.9		-7,998.5	

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

From Paid-employment > 50 years

Specification	I $\frac{dy/dx}{y}$ %	I t-stat.	II $\frac{dy/dx}{y}$ %	II t-stat.	III $\frac{dy/dx}{y}$ %	III t-stat.
Predicted probability (y)	0.0357		0.0357		0.0357	
Independent variables (x)						
Main predictors: Health						
Health status (1-5)	21.00	6.44 ***				
Health limitations (1-3)			31.20	6.86 ***		
Hospital admission as in-patient (0-1)					35.13	4.49 ***
Demographic characteristics						
Female (0-1)	2.17	0.36	3.52	0.58	4.38	0.72
Age 50-54 (ref.) (0-1)						
Age 55-59 (0-1)	108.44	18.26 ***	108.47	18.27 ***	109.75	18.37 ***
Age >60 (0-1)	256.26	17.50 ***	257.56	17.55 ***	260.12	17.69 ***
Cohabiting (0-1)	4.73	0.67	4.80	0.69	3.97	0.56
Children under 14 (0-1)	-23.14	-2.68 ***	-23.67	-2.76 ***	-23.17	-2.68 ***
Educational attainment						
Basic education (ref.) (0-1)						
Secondary education (0-1)	-5.95	-0.91	-6.39	-0.98	-7.75	-1.19
Tertiary education (0-1)	-15.86	-2.19 **	-16.62	-2.31 **	-19.02	-2.66 ***
Job related aspects						
Weekly working hours 15-39 (ref.) (0-1)	-3.46	-0.59	-2.65	-0.45	-3.38	-0.58
Weekly working hours 40-49 (0-1)	-33.81	-3.83 ***	-33.63	-3.82 ***	-34.43	-3.91 ***
Weekly working hours 50-59 (0-1)	15.17	1.34	16.52	1.46	15.01	1.32
Weekly working hours > 60 (0-1)						
Number of regular employees in local unit 1-4 (ref.) (0-1)	5.22	0.66	4.56	0.57	4.58	0.58
Number of regular employees in local unit 5-19 (0-1)	15.59	2.27 **	14.77	2.14 **	15.19	2.21 **
Number of regular employees in local unit >20 (0-1)						
Economic situation	10.58	4.37 ***	9.43	3.92 ***	8.30	3.45 ***
Ability to make ends meet (1-6)	12.06	6.57 ***	11.84	6.45 ***	11.87	6.46 ***
National unemployment rate						
Duration dependence	-0.51	-0.12	-0.11	-0.02	-0.47	-0.11
Ln (duration as paid employee)	21.00	6.44 ***				
Business sector dummies (18 categories; ref. Construction)	Yes		Yes		Yes	
Country dummies (13 categories; ref. Spain)	Yes		Yes		Yes	
Number of observations	44,176		44,176		44,176	
Number of completed spells	1,734		1,734		1,734	
Log pseudolikelihood	-16,763.7		-16,751.3		-16,807.1	

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

Main Results (iii) Average marginal effects on probability of exiting to other inactivity

From self-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0283		0.0283		0.0283	
Independent variables (x)	$\frac{dy/dx}{y}$%	t-stat.	$\frac{dy/dx}{y}$%	t-stat.	$\frac{dy/dx}{y}$%	t-stat.
Main predictors: Health						
Health status (1-5)	26.84	5.38 ***				
Health limitations (1-3)			31.02	4.71 ***		
Hospital admission as in-patient (0-1)					54.70	4.22 ***
Demographic characteristics						
Female (0-1)	177.84	11.94 ***	183.06	12.14 ***	185.64	12.23 ***
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	40.26	3.97 ***	42.20	4.17 ***	42.90	4.26 ***
Age >60 (0-1)	79.24	5.84 ***	82.10	6.01 ***	83.87	6.09 ***
Cohabiting (0-1)	21.72	2.09 **	22.06	2.13 **	23.42	2.28 **
Children under 14 (0-1)	-8.96	-0.71	-9.10	-0.72	-10.29	-0.82
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	7.43	0.54	4.06	0.30	4.75	0.35
Tertiary education (0-1)	3.56	0.20	-0.71	-0.04	0.90	0.05
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	-15.38	-1.20	-17.13	-1.34	-19.56	-1.52
Weekly working hours 50-59 (0-1)	-41.93	-3.19 ***	-42.22	-3.22 ***	-44.95	-3.40 ***
Weekly working hours > 60 (0-1)	-53.89	-4.48 ***	-54.08	-4.48 ***	-56.37	-4.63 ***
Own account worker (*ref.*)						
Number of regular employees in local unit 1-4 (0-1)	-26.40	-2.88 ***	-27.93	-3.07 ***	-29.07	-3.19 ***
Number of regular employees in local unit 5-19 (0-1)	-50.75	-3.14 ***	-52.08	-3.26 ***	-54.79	-3.51 ***
Number of regular employees in local unit >20 (0-1)	-31.30	-1.02	-31.83	-1.04	-35.80	-1.22
Economic situation						
Ability to make ends meet (1-6)	2.18	0.53	0.20	0.05	-1.05	-0.26
National unemployment rate	7.64	3.88 ***	7.23	3.70 ***	7.75	3.95 ***
Duration dependence						
Ln (duration as self-employed)	-29.04	-5.48 ***	-28.90	-5.46 ***	-29.47	-5.58 ***
Business sector dummies (18 categories; *ref.* Construction)	Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)	Yes		Yes		Yes	
Number of observations	22,721		22,721		22,721	
Number of completed spells	656		656		656	
Log pseudolikelihood	-7,967.3		-7,966.9		-7,998.5	

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

From paid-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0221		0.0221		0.0221	
Independent variables (x)	$\frac{dy/dx}{y}$%	t-stat.	$\frac{dy/dx}{y}$%	t-stat.	$\frac{dy/dx}{y}$%	t-stat.
Main predictors: Health						
Health status (1-5)	35.65	8.21 ***				
Health limitations (1-3)			54.63	10.30 ***		
Hospital admission as in-patient (0-1)					65.88	6.49 ***
Demographic characteristics						
Female (0-1)	100.76	10.55 ***	102.92	10.72 ***	106.86	10.91 ***
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	63.30	7.98 ***	63.89	8.05 ***	65.80	8.25 ***
Age >60 (0-1)	118.14	8.06 ***	119.37	8.12 ***	124.46	8.34 ***
Cohabiting (0-1)	18.87	2.31 **	20.26	2.50 **	18.91	2.33 **
Children under 14 (0-1)	-9.93	-0.88	-11.10	-1.00	-11.24	-1.01
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	-2.57	-0.29	-2.31	-0.26	-5.90	-0.67
Tertiary education (0-1)	-1.90	-0.19	-3.20	-0.32	-7.09	-0.73
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	-27.93	-3.51 ***	-27.76	-3.48 ***	-29.45	-3.68 ***
Weekly working hours 50-59 (0-1)	-27.40	-1.91 *	-27.10	-1.88 *	-28.78	-2.00 **
Weekly working hours > 60 (0-1)	-15.98	-1.00	-14.94	-0.93	-16.64	-1.04
Number of regular employees in local unit 1-4 (*ref.*) (0-1)						
Number of regular employees in local unit 5-19 (0-1)	-35.30	-3.20 ***	-35.71	-3.23 ***	-34.95	-3.17 ***
Number of regular employees in local unit >20 (0-1)	-37.43	-3.87 ***	-37.84	-3.91 ***	-37.41	-3.88 ***
Economic situation						
Ability to make ends meet (1-6)	-1.65	-0.54	-2.78	-0.93	-5.34	-1.79 *
National unemployment rate	4.33	2.79 ***	4.33	2.79 ***	4.42	2.83 ***
Duration dependence						
Ln (duration as paid employee)	-51.97	-9.36 ***	-51.14	-9.21 ***	-52.17	-9.37 ***
Business sector dummies (18 categories; *ref.* Construction)	Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)	Yes		Yes		Yes	
Number of observations	44,176		44,176		44,176	
Number of completed spells	1,036		1,036		1,036	
Log pseudolikelihood	-16,763.7		-16,751.3		-16,807.1	

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

Main Results (iv) Average marginal effects on probability of exiting to unemployment
From self-employment >50 years   From paid-employment >50 years

From self-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0061		0.0061		0.0061	
Independent variables (x)	$\frac{dy/dx}{y}$ % [a]	t-stat.	$\frac{dy/dx}{y}$ % [a]	t-stat.	$\frac{dy/dx}{y}$ % [a]	t-stat.
Main predictors: Health						
Health status (1-5)	6.89	0.66				
Health limitations (1-3)			-19.50	-1.20		
Hospital admission as in-patient (0-1)					-37.10	-1.00
Demographic characteristics						
Female (0-1)	-42.28	-2.25 **	-41.59	-2.20**	-42.13	-2.24**
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	45.18	1.81 *	47.91	1.92 *	47.56	1.91*
Age >60 (0-1)	-35.40	-1.60	-33.07	-1.48	-33.94	-1.52
Cohabiting (0-1)	-22.68	-0.75	-22.85	-0.76	-22.90	-0.76
Children under 14 (0-1)	-6.88	-0.28	-7.64	-0.32	-7.48	-0.31
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	-13.29	-0.55	-14.50	-0.61	-14.72	-0.62
Tertiary education (0-1)	-45.89	-1.46	-47.95	-1.55	-48.01	-1.57
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	-83.72	-2.35 **	-90.35	-2.51 **	-88.03	-2.47**
Weekly working hours 50-59 (0-1)	-118.25	-3.29 ***	-124.98	-3.41 ***	-122.43	-3.36***
Weekly working hours > 60 (0-1)	-134.56	-3.84 ***	-140.78	-3.93 ***	-138.80	-3.92***
Own account worker (*ref.*)						
Number of regular employees in local unit 1-4 (0-1)	-41.86	-2.23 **	-42.42	-2.26 **	-41.98	-2.24**
Number of regular employees in local unit 5-19 (0-1)	-41.14	-1.17	-43.12	-1.24	-40.55	-1.15
Number of regular employees in local unit >20 (0-1)	36.04	0.53	35.80	0.53	37.65	0.56
Economic situation						
Ability to make ends meet (1-6)	-45.83	-5.49 ***	-47.14	-5.60 ***	-46.87	-5.55***
National unemployment rate	18.71	3.67 ***	18.97	3.70 ***	18.81	3.68***
Duration dependence						
Ln (duration as self-employed)	-57.22	-4.78 ***	-57.16	-4.78 ***	-57.43	-4.81***
Business sector dummies (18 categories; *ref.* Construction)		Yes		Yes		Yes
Country dummies (13 categories; *ref.* Spain)		Yes		Yes		Yes
Number of observations		22,721		22,721		22,721
Number of completed spells		146		146		146
Log pseudolikelihood		-7,967.3		-7,966.9		-7,998.5

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

From paid-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0235		0.0235		0.0235	
Independent variables (x)	$\frac{dy/dx}{y}$ % [a]	t-stat.	$\frac{dy/dx}{y}$ % [a]	t-stat.	$\frac{dy/dx}{y}$ % [a]	t-stat.
Main predictors: Health						
Health status (1-5)	15.67	4.03 ***				
Health limitations (1-3)			22.81	4.09 ***		
Hospital admission as in-patient (0-1)					18.40	1.71 *
Demographic characteristics						
Female (0-1)	8.40	1.01	8.97	1.08	9.72	1.17
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	35.57	4.48 ***	36.24	4.55 ***	37.44	4.68 ***
Age >60 (0-1)	-13.58	-1.46	-12.90	-1.38	-11.81	-1.26
Cohabiting (0-1)	-13.65	-1.42	-13.07	-1.36	-13.42	-1.40
Children under 14 (0-1)	10.69	1.02	10.25	0.98	9.94	0.95
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	-17.00	-2.01 **	-17.55	-2.07 **	-18.47	-2.19 **
Tertiary education (0-1)	-38.20	-4.13 ***	-39.34	-4.29 ***	-40.81	-4.49 ***
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	4.32	0.58	4.34	0.59	3.91	0.53
Weekly working hours 50-59 (0-1)	-15.05	-1.26	-15.05	-1.25	-15.70	-1.31
Weekly working hours > 60 (0-1)	13.40	0.87	13.40	0.87	13.16	0.85
Number of regular employees in local unit 1-4 (*ref.*) (0-1)						
Number of regular employees in local unit 5-19 (0-1)	0.07	0.01	-0.02	0.00	-0.03	0.00
Number of regular employees in local unit >20 (0-1)	-37.78	-3.97 ***	-37.88	-3.99 ***	-37.88	-3.98 ***
Economic situation						
Ability to make ends meet (1-6)	-14.87	-4.84 ***	-15.56	-5.08 ***	-16.36	-5.35 ***
National unemployment rate	7.38	4.35 ***	7.37	4.34 ***	7.31	4.31 ***
Duration dependence						
Ln (duration as paid employee)	-45.20	-8.06 ***	-44.88	-8.00 ***	-45.41	-8.07 ***
Business sector dummies (18 categories; *ref.* Construction)		Yes		Yes		Yes
Country dummies (13 categories; *ref.* Spain)		Yes		Yes		Yes
Number of observations		44,176		44,176		44,176
Number of completed spells		1,168		1,168		1,168
Log pseudolikelihood		-16,763.7		-16,751.3		-16,807.1

Notes: [a] Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

Main Results (v) Average marginal effects on probability of exiting to paid-employment

From self-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0252		0.0252		0.0252	
Independent variables (x)	$\frac{dy/dx}{y}$ %	t-stat.	$\frac{dy/dx}{y}$ %	t-stat.	$\frac{dy/dx}{y}$ %	t-stat.
Main predictors: Health						
Health status (1-5)	-13.01	-2.45 **				
Health limitations (1-3)			-24.43	-2.41 **		
Hospital admission as in-patient (0-1)					15.04	1.00
Demographic characteristics						
Female (0-1)	-37.74	-3.98 ***	-38.44	-4.06 ***	-39.03	-4.14***
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	47.20	3.75 ***	46.65	3.71 ***	45.29	3.62***
Age >60 (0-1)	29.10	2.02 **	27.70	1.94 *	25.69	1.82*
Cohabiting (0-1)	-1.86	-0.14	-1.98	-0.15	-2.98	-0.22
Children under 14 (0-1)	-17.21	-1.49	-17.04	-1.47	-16.57	-1.43
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	-1.49	-0.13	-0.42	-0.04	0.16	0.01
Tertiary education (0-1)	13.06	0.80	14.88	0.90	16.03	0.96
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	-15.82	-1.05	-15.64	-1.04	-11.79	-0.80
Weekly working hours 50-59 (0-1)	-50.41	-3.28 ***	-50.50	-3.29 ***	-46.53	-3.08***
Weekly working hours > 60 (0-1)	-69.62	-4.79 ***	-69.60	-4.80***	-65.99	-4.64***
Own account worker (*ref.*)						
Number of regular employees in local unit 1-4 (0-1)	20.96	2.16 **	21.20	2.18**	21.63	2.22**
Number of regular employees in local unit 5-19 (0-1)	119.04	4.94 ***	118.76	4.92 ***	121.24	4.98***
Number of regular employees in local unit >20 (0-1)	61.97	2.09 **	61.02	2.06 **	63.15	2.11**
Economic situation						
Ability to make ends meet (1-6)	-14.28	-3.69 ***	-13.79	-3.60 ***	-12.87	-3.36***
National unemployment rate	10.30	4.31 ***	10.57	4.40 ***	10.37	4.33***
Duration dependence						
Ln (duration as self-employed)	-73.70	-11.92 ***	-73.64	-11.88 ***	-73.40	-11.85***
Business sector dummies (18 categories; *ref.* Construction)	Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)	Yes		Yes		Yes	
Number of observations	22,721		22,721		22,721	
Number of completed spells	618		618		618	
Log pseudolikelihood	-7,967.3		-7,966.9		-7,998.5	

Notes: * Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

From paid-employment >50 years

Specification	I		II		III	
Predicted probability (y)	0.0121		0.0121		0.0121	
Independent variables (x)	$\frac{dy/dx}{y}$ %	t-stat.	$\frac{dy/dx}{y}$ %	t-stat.	$\frac{dy/dx}{y}$ %	t-stat.
Main predictors: Health						
Health status (1-5)	-3.75	-0.67				
Health limitations (1-3)			-4.33	-0.45		
Hospital admission as in-patient (0-1)					-33.77	-1.73 *
Demographic characteristics						
Female (0-1)	-61.60	-6.10 ***	-61.76	-6.14 ***	-62.05	-6.18 ***
Age 50-54 (*ref.*) (0-1)						
Age 55-59 (0-1)	46.28	4.28 ***	45.88	4.27 ***	46.12	4.29 ***
Age >60 (0-1)	60.58	3.59 ***	60.24	3.59***	60.19	3.60***
Cohabiting (0-1)	0.50	0.04	0.42	0.03	0.60	0.04
Children under 14 (0-1)	1.78	0.13	1.98	0.14	1.98	0.14
Educational attainment						
Basic education (*ref.*) (0-1)						
Secondary education (0-1)	43.86	2.94 ***	44.16	2.96***	44.52	2.97 ***
Tertiary education (0-1)	55.29	3.17***	55.83	3.20***	56.08	3.20***
Job related aspects						
Weekly working hours 15-39 (*ref.*) (0-1)						
Weekly working hours 40-49 (0-1)	-0.66	-0.06	-0.53	-0.05	-0.41	-0.04
Weekly working hours 50-59 (0-1)	38.66	1.99 **	38.99	2.00 **	38.91	2.00**
Weekly working hours > 60 (0-1)	59.31	2.55 **	59.19	2.55**	58.87	2.53**
Number of regular employees in local unit 1-4 (*ref.*) (0-1)						
Number of regular employees in local unit 5-19 (0-1)	-127.08	-7.09 ***	-127.02	-7.09***	-126.82	-7.08 ***
Number of regular employees in local unit >20 (0-1)	-174.27	-10.15 ***	-174.20	-10.14***	-173.93	-10.14***
Economic situation						
Ability to make ends meet (1-6)	13.40	3.20 ***	13.59	3.27 ***	13.74	3.31 ***
National unemployment rate	0.68	0.32	0.74	0.35	0.69	0.32
Duration dependence						
Ln (duration as paid employee)	-109.80	-12.38 ***	-109.79	-12.37 ***	-109.69	-12.38 ***
Business sector dummies (18 categories; *ref.* Construction)	Yes		Yes		Yes	
Country dummies (13 categories; *ref.* Spain)	Yes		Yes		Yes	
Number of observations	44,176		44,176		44,176	
Number of completed spells	574		574		574	
Log pseudolikelihood	-16,763.7		-16,751.3		-16,807.1	

Notes: * Average marginal effects expressed in relative terms with respect to predicted probabilities.
* $0.1 > p \geq 0.05$; ** $0.05 > p \geq 0.01$; *** $p < 0.01$.

	Predicted probabilities of exiting to…							
	Early retirement		Other inactivity		Unemployment		PE	SE
Coming from…	SE	PE	SE	PE	SE	PE	SE	PE
Health status								
Very good	2.02%	2.96%	2.20%	1.61%	0.65%	2.03%	2.86%	1.22%
Good	2.34%	3.33%	2.44%	1.95%	0.55%	2.13%	2.64%	1.29%
Fair	2.78%	3.75%	2.86%	2.37%	0.58%	2.71%	2.34%	1.06%
Bad	5.56%	6.24%	5.09%	4.84%	0.95%	3.03%	1.91%	1.23%
Very bad	7.75%	7.18%	5.62%	7.69%	0.37%	3.30%	1.02%	1.48%

Summary

- Elderly self-employed workers seem to have a better perception about their health state than their paid-employment counterparts

- One could expect than the probability od early retirement should be higher for paid-employees than for self-employed workers

- However, Paid employees can avoid a disease becoming in a free rider in the firm, abusing of different forms of protection and in this way enlarge their working lives. These factors could be behind these battery of results

- Controls operate in the expected way

Conclusions

- Our results provide new results on the phenomenon of precarious self-employment.

- This phenomenon is closely associated to the emergence of the GIG sector.

- Our results help to characterise to what extent this phenomenon is associated to some types of self-employees and to certain individual characteristics.

Further research

- Check differences before and after this crisis (Business cycle effects or even structural changes after the Great Recession).

- Explore differences across countries and industries, paying attention to the effects of the emergence of new phenomena like the growing of self-employment and freelance in the GIG sector, and specially among older workers

- Complete these analysis with a Macro analysis

- Explore/Evaluate the effects of some schemes of incentives for early retirement distinguishing among paid-employees and self-employed workers

Thank you for your attention !!!

Exploring the role of health in Early Retirement by occupational status: looking for the causes of the greying of the self-employed sector

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