

Appendix A

Pension Eligibility Rules in the SHARE Countries

The eligibility ages reported in our paper are the results of the country specific retirement rules that involve the cohorts in the study (born in 1934–1954) until 2004 (the first wave of SHARE). Actually, in most of these countries eligibility for early retirement also depends on work experience through the number of years of contributions. Since we do not have this information, we consider the minimum age at which an individual may have access to early retirement. For changes in the legislations, we consider the first cohort “potentially” affected (FCA). For instance, in Belgium normal retirement age for women has been gradually raised from 60 to 63: age 61 in 1997, to age 62 in 2000, and age 63 in 2003. Thus, the FCA was the 1937 cohort in 1997, the 1939 cohort in 2000, and the 1941 cohort in 2003.

Our strategy cannot perfectly predict individuals’ behaviors for several reasons. First, there are additional routes to early retirement in each country (e.g. long-term unemployment, disability, plant disclosure or redundant workers). In this case, we consider the retirement program that affects the largest fraction of respondents, avoiding to consider individual characteristics that might be endogenously correlated with respondents’ health and cognition. Second, during the 90’s several countries introduced changes in the legislation that removes adverse incentive effects by moving from a “pay as you go” system to less generous and more actuarially fair schemes. However, as in the case of Denmark, Germany and the Netherlands, these changes did not affect the legal early and normal retirement age. Nevertheless, these retirement ages are able to predict the most important jumps in the retirement age distribution reported in Figure 1 and 2.

The starting source of information on early and normal ages of eligibility for public old-age pensions in the SHARE countries is the Mutual Information System on

Social Protection (MISSOC) database and the Social Security Administration (SSA) website. The MISSOC collects information on social protection for the member states of the European Union and other countries, including Switzerland. The SSA website highlights the principal features of social security programs in more than 170 countries every 2 years. These initial sources were supplemented with information from Gruber and Wise (1999, 2004, 2007), Angelini, Brugiavini and Weber (2009) and several other country specific auxiliary data sources. Below we report the statutory old age and early retirement ages used in this paper for each country. The retirement age reported are slightly different from Mazzonna and Peracchi (2012). In particular, we improve our information about past pension reforms, increasing the within country variability.

Austria

The statutory old retirement age is 65 for men and 60 for women. The early retirement age was 60 for men and 55 for women. The 2000 and 2003 pension reforms gradually increased the eligibility age of 2 years (step-wise increase of 2 month each quarter) for men born after September 1940 and for women born after September 1945 (see Staubli and Zweimueller 2013).

Belgium

The statutory old age retirement is 65 for males. For women it was 60 but it has been gradually raised to 61 in 1997 (FCA 1937), 62 in 2000 (FCA 1939), and 63 in 2003 (FCA 1941). The early retirement age is 55 for women and 60 for men.

Denmark

The statutory old age retirement is 67 for both men and women up to 2003. From 2004 it

has been decreased to 65 (1999 reform). The early retirement age is 60 for both men and women.

France

In France, the statutory old retirement was 65 but it was lowered to 60 in 1983 for both men and women. The early retirement age is 55 for some categories and 60 for others (we use 55 since it affected the largest share of workers).

Germany

The statutory old age retirement is, from 1961, 65 for both men and women. In the case of early retirement age it is possible from 1973 to have a pension with full benefits at 63 years of age (with 35 years of contribution) for men, and 60 years of age (with 15 years of contribution) for women. However, public retirement insurance pays pensions without adjustment for employees from age 60 if certain conditions are met (e.g. unemployed, part-time employed and workers who cannot be appropriately employed). As shown by Berkel and Börsch-Supan (2004), the interpretation of the laws was particularly generous, so 60 became the actual early retirement age (see also the peak in Figure 1 in particular in the East Germany. In addition, retirement before 60 was also possible mainly using unemployment compensation. With two consecutive reforms (1992 and 2001), the system was simplified and the generosity of the system dramatically decreased. In particular, after a transitional period the early retirement age was set to 63 for everybody. For women, the step-wise increase took place in 2001 reaching 62 in 2004 and 63 in 2006. For men, the step-wise increase was heterogeneous across the categories aforementioned and affected the cohorts in this paper only marginally.

Italy

The statutory old age retirement was 60 (65 in the public sector) for men and 55 (60 in the public sector) for women from 1961 to 1993. Several consecutive reforms (1992, 1995 and 1998) increased the statutory old age retirement to 65 for men and 60 for women with step-wise increments from 1994 to 2000. From 1965 to 1995, early retirement was possible at any age with 35 years of contributions (25 in the public sector) for both men and women; From 1996 to 2004 it was stepwise increased up to 57 for both the private and public sector.

The Netherlands

The statutory retirement age is 65 both for men and women. At the end of the eighties the eligibility age for many early retirement schemes (including disability and unemployment) was 60 or 61 for the majority of the employees without actuarial adjustment for both men and women. Starting from the mid-1990s, several financial parameters of the early retirement schemes were changed (e.g., the contribution requirements to obtain the maximum benefit). See also Euwals, van Vuuren, and Wolthoff (2010).

Spain

The statutory old age retirement is 65 both for men and women. From 1983 to 1993, early retirement was possible at age 60 for both men and women; From 1994 to 2001, it was raised at 61 for both men and women; From 2002, early retirement is possible with 61 years of age and 30 years of contributions for both men and women.

Sweden

The statutory old age retirement was 67 for both men and women from 1961 to 1994. From

1995, it was changed to 65 for both men and women. From 1961 to 1962 there was no early retirement. From 1963 to 1997, it was allowed at age 60 for both men and women. From 1998, it was raised to 61 for both men and women.

Switzerland

The statutory old age retirement is 65 for men and 62 for women from 1975. In 2001, women's retirement age was raised to 63. Only since 1997 old-age insurance pensions can be claimed prior to the legal retirement age (1991 reform). In particular, men were allowed to retire at 64 from 1997 to 2001, and at 63 from 2001. For women early retirement was allowed at age 62 only from 2001.

Additional References for Retirement Ages

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Appendix B

Additional Tables

Table B.1
Effects of retirement by physical burden of the job (specification with age dummies).

	Low (1–5)	High (6–10)	Very low (1–3)	Median (4–6)	Very high (7–10)
<hr/> Predicted good health <hr/>					
DistR	-0.008 ** (0.004)	-0.009 * (0.005)	-0.005 (0.005)	-0.011 *** (0.004)	-0.009 * (0.006)
Retired	0.004 (0.045)	0.108 * (0.062)	0.002 (0.045)	0.039 (0.061)	0.131 * (0.075)
<i>N</i>	4,193	3,546	2,251	2,801	2,687
Kleibergen-Paap <i>F</i>	25.942	21.045	15.951	15.088	17.967
Sargan-Hansen <i>J</i>	3.313	1.210	0.724	2.265	2.382
<hr/> Cognitive score <hr/>					
DistR	-0.054 ** (0.022)	-0.029 (0.024)	-0.078 *** (0.025)	-0.046 * (0.026)	-0.018 (0.028)
Retired	0.121 (0.287)	0.558 * (0.330)	0.112 (0.300)	-0.039 (0.395)	0.662 * (0.376)
<i>N</i>	4,137	3,485	2,228	2,765	2,629
Kleibergen-Paap <i>F</i>	23.693	18.550	14.168	13.598	15.916
Sargan-Hansen <i>J</i>	0.818	1.227	1.225	1.842	0.587

Notes: The table reports results from 2SLS-FD estimates by job type (according to the external index of physical burden), as in Model B of Table 7. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level.

Table B.2

Effects of retirement on health by gender and physical burden of the job (2SLS-FD).

	Gender		Physical burden	
	Men	Women	Low (1-5)	High (6-10)
<hr/> Not depressed <hr/>				
DistR	-0.020 *** (0.007)	0.006 (0.008)	-0.006 (0.007)	-0.011 (0.009)
Retired	0.063 (0.085)	-0.013 (0.106)	-0.179 ** (0.080)	0.225 ** (0.101)
<i>N</i>	4,486	3,540	4,201	3,556
Kleibergen-Paap <i>F</i>	39.304	42.343	41.420	36.473
Sargan-Hansen <i>J</i>	2.293	0.695	0.318	1.483
<hr/> No mobility limitations <hr/>				
DistR	-0.017 *** (0.007)	-0.008 (0.008)	-0.013 ** (0.007)	-0.015 * (0.008)
Retired	0.172 * (0.090)	0.033 (0.099)	-0.000 (0.078)	0.207 ** (0.101)
<i>N</i>	4,571	3,586	4,262	3,619
Kleibergen-Paap <i>F</i>	39.804	43.084	41.206	37.529
Sargan-Hansen <i>J</i>	1.592	2.804	3.132	1.463
<hr/> Good health <hr/>				
DistR	-0.025 *** (0.007)	-0.006 (0.007)	-0.020 *** (0.006)	-0.016 * (0.008)
Retired	0.126 (0.097)	-0.008 (0.075)	0.046 (0.079)	0.078 (0.102)
<i>N</i>	4,573	3,586	4,263	3,620
Kleibergen-Paap <i>F</i>	39.824	43.084	41.217	37.542
Sargan-Hansen <i>J</i>	6.854 *	3.108	2.813	4.990 *

Notes: The table reports results from 2SLS-FD estimates by gender and job type (according to the external index of physical burden), as in Model B of Table 6. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level.

Table B.3
Effects of retirement on cognitive abilities by gender and physical burden of the job (2SLS-FD).

	Gender		Physical burden	
	Men	Women	Low (1-5)	High (6-10)
Memory				
DistR	-0.137 ** (0.054)	-0.160 ** (0.069)	-0.152 ** (0.059)	-0.124 ** (0.061)
Retired	0.365 (0.640)	0.288 (0.637)	-0.457 (0.561)	1.417 ** (0.719)
<i>N</i>	4,514	3,562	4,224	3,581
Kleibergen-Paap <i>F</i>	38.831	43.170	41.220	36.596
Sargan-Hansen <i>J</i>	0.789	5.642	1.503	1.052
Fluency				
DistR	-0.297 *** (0.108)	-0.271 ** (0.109)	-0.311 *** (0.112)	-0.192 * (0.107)
Retired	1.346 (1.474)	-0.903 (1.205)	-0.774 (1.459)	2.124 * (1.243)
<i>N</i>	4,445	3,512	4,155	3,534
Kleibergen-Paap <i>F</i>	37.499	42.721	40.045	36.236
Sargan-Hansen <i>J</i>	3.713	1.327	1.649	0.185
Numeracy				
DistR	-0.036 ** (0.015)	-0.009 (0.019)	-0.014 (0.015)	-0.033 * (0.018)
Retired	0.120 (0.185)	0.173 (0.184)	0.063 (0.209)	0.210 (0.227)
<i>N</i>	4,468	3,525	4,202	3,523
Kleibergen-Paap <i>F</i>	38.826	42.041	41.085	35.856
Sargan-Hansen <i>J</i>	2.512	1.654	1.262	0.232

Notes: The table reports results from 2SLS-FD estimates by gender and job type (according to the external index of physical burden), as in Model B of Table 6. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level.

Table B.4

Unweighted vs. weighted estimates of the effects of retirement on predicted good health and cognitive index by physical burden of the job.

	Low (1-5)		High (6-10)	
	Unweighted	Weighted	Unweighted	Weighted
<hr/> Predicted good health <hr/>				
DistR	-0.006 *	-0.006 *	-0.007 *	-0.007 *
	(0.003)	(0.003)	(0.004)	(0.004)
Retired	-0.020	-0.030	0.093 **	0.098 **
	(0.036)	(0.035)	(0.042)	(0.044)
<i>N</i>	4,142	4,142	3,518	3,518
Kleibergen-Paap <i>F</i>	40.505	39.989	36.735	35.216
Sargan-Hansen <i>J</i>	2.245	3.874	1.122	0.768
<hr/> Cognitive index <hr/>				
DistR	-0.059 ***	-0.067 ***	-0.057 ***	-0.063 ***
	(0.019)	(0.020)	(0.020)	(0.022)
Retired	-0.114	-0.078	0.517 **	0.536 **
	(0.221)	(0.227)	(0.231)	(0.231)
<i>N</i>	4,119	4,119	3,470	3,470
Kleibergen-Paap <i>F</i>	39.147	38.683	35.933	34.623
Sargan-Hansen <i>J</i>	0.426	0.328	0.310	0.108

Notes: In this table we compare unweighted and weighted (IPW) estimates of the effect of retirement on depression and Memory by job physical burden using 2SLS-FD. The table reports results from 2SLS-FD estimates by job type (according to the external index of physical burden), as in Model B of Table 6. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level.

Table B.5
 Probit model for the probability of being employed in high physically demanding jobs.

Age	-
	0.0
	10
	*
	*
	(0.
	00
	4)
DistE	0.000 (0.004)
DistN	0.006 (0.004)
EligE	0.013 (0.019)
EligN	0.030 (0.021)
Low educ	
	0.
	357
	**
	*
	(0.0
	11)
<i>N</i>	7,893

Notes: The model also includes country fixed effects, country specific linear age trends and controls for marital status.

Table B.6
 2SLS. Effect of retirement by education and gender.

	Men		Women	
	No college	College	No college	College
SRH				
DistR	-0.011 *** (0.004)	-0.007 (0.005)	-0.000 (0.004)	-0.007 (0.006)
Retired	0.060 (0.055)	0.007 (0.060)	0.023 (0.041)	0.051 (0.062)
<i>N</i>	3,310	1,168	2,543	985
<i>F</i> ^a	28.73	9.63	33.12	8.44
Cognition				
DistR	-0.086 *** (0.022)	-0.010 (0.033)	-0.057 ** (0.024)	-0.010 (0.043)
Retired	0.495 * (0.270)	-0.823 * (0.481)	0.262 (0.225)	-0.632 (0.507)
<i>N</i>	3,263	1,147	2,504	972
<i>F</i>	27.02	8.60	32.40	8.20

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level. *F* denotes the Kleibergen-Paap test statistic.

Table B.7

2SLS. Effect of retirement by physical burden and gender for people with less than a college degree.

	Men		Women	
	Low (1–5)	High (6–10)	Low (1–5)	High (6–10)
SRH				
DistR	-0.015 *** (0.006)	-0.006 (0.005)	0.002 (0.006)	-0.001 (0.006)
Retired	-0.024 (0.056)	0.154 * (0.090)	-0.052 (0.054)	0.037 (0.056)
<i>N</i>	1,379	1,799	1,104	1,376
<i>F</i>	15.86	13.03	14.47	20.02
Cognition				
DistR	-0.082 ** (0.035)	-0.086 *** (0.028)	-0.090 *** (0.033)	-0.023 (0.031)
Retired	0.626 (0.428)	0.732 * (0.407)	0.028 (0.386)	0.547 ** (0.279)
<i>N</i>	1,366	1,765	1,093	1,349
<i>F</i>	14.57	12.54	14.77	18.84

Notes: Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level. *F* denotes the Kleibergen-Paap test statistic.

Table B.8
 Estimated retesting effects.

Refresh	-0.098 *** (0.028)	-0.096 *** (0.026)
Refresh*Retired	0.002 (0.043)	
Refresh*No college		-0.002 (0.044)
<i>N</i>	13,904	13,904

Notes: The table reports the result of a regression of our cognitive index on a dummy for belonging to the refreshment sample (Refresh), interacted with either a dummy for being retired (Retired) or a dummy for having less than college education (No college). Both regression also control for age, education, gender, employment status, and country fixed effects. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are robust to clustering at the country and cohort level.

Appendix C

Internal Index of Physical Burden

We construct our index by using the response from those who are currently employed to estimate the following linear model:

$$PB_{ij} = \alpha + \beta A_i + \delta_j O_{ij} + U_{ij},$$

where PB_{ij} is the self-reported level of physical burden (that ranges between 1 and 4) of the occupation of individual i working in occupation j , A_i is the age of the respondent, O_{ij} is a vector of binary indicators for each occupation recorded in SHARE based on the second digit of the ISCO-88 classification, and U_{ij} is a regression error with the usual properties. To control for differences by gender and country, we also include among the regressors in model (1) an indicator for being a female and a set of indicators for the country of residence. Our index of physical burden is just $\hat{\delta}_j O_{ij}$, where $\hat{\delta}_j$ is the OLS estimate of the vector of parameters δ_j . One advantage of this approach is that we can construct the index also for those who are retired using information on their last job. Based on the value of our index, we separate respondents into two groups: those in less physically demanding jobs and those in more physically demanding jobs. We use the threshold value of 2, corresponding to “agreement” with the statement reported above. The results using this internal index are largely consistent with those reported in the main text.