

**“I want to break free”.**  
**The Role of Working Conditions on Retirement Expectations and Decisions**

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**Abstract**

We investigate the role of working conditions on the desire to retire as soon as possible and on the probability of transition from employment to either full or partial retirement, using different measures of work quality. We find that low work quality strongly correlates with the desire to retire as soon as possible of “young-old” workers. This might be explained by the deterioration of employer-employee match with age due to reduced incentives for firms to invest in training and work practises that enhance workability of their senior workers. When we move from intentions to decisions, the role of work quality is less clear-cut and it mainly plays a role in the transitions from employment to full retirement.

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## 1. Introduction

In most European countries, population is aging rapidly. The changes in the demographic structure of the population in the last decades have placed a lot of pressure on their welfare systems. Moreover, the labour market participation of individuals aged 50-69 (the so-called 'young-old') was decreasing strongly until the end of last century (Gruber and Wise 1999). Since the 1970s, early exits from work had become a major challenge to the public pension systems. Governments, employers and trade unions alike once thought of early retirement as a solution to the economic problems posed by mass unemployment and mass restructuring (Ebbinghaus 2006). Today, instead, governments and international organizations advocate the postponement of retirement, the increase in labour participation of the young-old and the reform of social security in order to ensure the fiscal sustainability of the pension and welfare systems. But despite the long season of reforms aiming at inducing individuals to work longer, most workers leave the labour market before the standard pension eligibility age in most OECD countries (OECD 2011). These changes in fact are not popular with individuals potentially affected by the reforms, despite the evidence that early retirement can be bad for mental health (Rohwedder and Willis 2010; Celidoni et al. 2013) and for financial well-being at least in the long run (Angelini et al. 2009).

Understanding the determinants of early retirement is then a major challenge if we want to keep older individuals in the labour force. Extensive literature in economics has shown the role played by public pension systems in explaining low participation rates of the young-old in US and Europe (Lumsdaine and Mitchell 1999, Gruber and Wise 2001, 2004 and 2005).

However, financial considerations are not the sole determinants of retirement behaviour. Poor health, chronic illness and disability are recognized as important reasons of early exits from the labour market for older workers (Krause et al. 1997; Blekesaune et al. 2005), in particular when working conditions cannot be adapted to the changed needs of the employees.

In the same way, a strand of literature has identified in the poor quality of work another important determinant of early retirement behaviour. Drentea (2002) argues that work is alienating and retirement liberating, because retirees experience less anxiety and distress. Early exits from labour market are in fact observed in employees with physically demanding or monotonous/repetitive jobs (Henkens et al. 1994). Furthermore, poor quality of work is frequently associated with an increase in the intention to leave and a reduction in performance and motivation, as shown among others by Siegrist et al. (2006) using the data from the first wave of the Survey on Health, Aging and Retirement (SHARE). Finally, Cottini et al. (2011), using Danish linked employer-employee data find that workplace hazards increase substantially the probability of voluntary turnover and workers under adverse workplace conditions are more likely to quit their jobs.

The aim of this paper is to investigate the role played by work quality on intended early retirement and on labour market participation at older ages using information from various waves of the SHARE database for 12 countries (Sweden, Denmark, Germany, the Netherlands, Belgium, France, Switzerland, Austria, Italy, Spain, Poland and Czech Republic). We first focus on individuals who were interviewed in wave 1 (2004-2005), wave 2 (2006-2007) and wave 4 (2010-2011) and currently work, and assess to what extent perceived work quality contributes to their desire to retire as soon as possible. Secondly, we look at individuals who work when they enter the SHARE sample (in the first or second wave) and follow them through time, to analyse the effect of work quality on transitions out of full employment.

This paper contributes to the existing literature by bringing together a number of different features. Firstly, we use several measures of work quality in order to capture different domains, such as effort, reward and stress. Secondly, we analyse the effect of work quality on both intention and decision to retire. Thirdly, we use cross-country data to investigate the differential role played by job quality in countries characterized by different welfare systems (such as the Scandinavian model for Nordic countries and the family-based model still prevailing in Mediterranean countries) and labour market institutions.

Last, but not least, we consider two possible transitions out of the labour market: full retirement and partial retirement. Partial retirement is an important policy option to promote labour market participation of the ‘young-old’ that is receiving much attention lately, particularly after recent welfare reforms. It is usually defined as a period characterized by the prevalence of a reduction in working hours. This phased transition from career jobs (long-tenure full time jobs) to retirement can occur within the same job or moving to a new part time short-term job, such as a bridge job.

## **2. Data and descriptive statistics**

The Survey of Health, Aging and Retirement (SHARE) is a multidisciplinary and cross-national database of micro data on health, socio-economic status and social and family network. The survey covers 20 countries representing the various regions in Europe, ranging from Scandinavia through Central to Mediterranean countries (including Israel) and Eastern Europe. It involves about 85,000 men and women aged 50 and more.

SHARE currently offers four waves of data, collected from 2004 to 2011, including life history information (the third wave called SHARELIFE). In terms of topics coverage, it includes socio-demographic characteristics, health, labour market participation and income sources.

A distinctive feature of SHARE, that makes this survey extremely appropriate for our research topic, is a set of questions on perceived work quality, along the key dimensions of effort, reward and control.

In this paper we analyse the role played by working conditions on the desire to retire as soon as possible (intention) and on the retirement decisions in 12 European countries (Sweden, Denmark, Germany, the Netherlands, Belgium, France, Switzerland, Austria, Italy, Spain, Czech Republic and Poland) for which data are available in at least three waves.

### **2.1 Work quality measures**

The battery of items on quality of work in the SHARE questionnaire is derived from the more extensive questionnaire measuring the demand-control model, Job Content Questionnaire (Karasek et al. 1998), and the effort-reward imbalance model (Siegrist 1996). Due to the multidisciplinary nature of SHARE, only a selection from these questionnaires is included. Especially the control dimension covered by the Job Content Questionnaire is captured by two items (“enough freedom in doing the job” and “opportunity to develop new skills”). For what concerns the effort dimension, respondents are asked whether the current job is physically demanding and stressful, whereas for the reward domain they report whether their salary is adequate, they receive support in difficult situations, recognition for their work, or they have job advancement prospects, and job security. Additionally, they answer a general question on the overall satisfaction with the current job. All questions about job quality are asked on a 4-point Likert scale (“fully agree” to “fully disagree”).

We construct a set of measures of job quality by exploiting the domains covered by the items and comparing general job satisfaction with more detailed aspects of current job.

The first measure of work quality we use is a dummy variable taking value 1 if the respondent strongly agrees with the statement “*All things considered I am satisfied with my job*”.

We then derive a set of dummies for different work quality components starting from the more detailed questions in the questionnaire.

Finally, we use these detailed work quality variables to construct a small set of work quality indicators. In order to establish which components have more power in explaining the underlying latent variable quality of work, we use exploratory factor analysis for data reduction. This is performed on the original ordinal variables to exploit all the available information. Standard methods (i.e., those based on a matrix of Pearson's correlations) assume that the variables are continuous and follow a multivariate normal distribution. In our case we have ordinal variables and factor analysis is best performed using a polychoric correlation matrix (Holgado–Tello et al. 2010). We identify two well defined factors and interpret them as capturing the effort dimension (stressful and physically demanding job) and the reward dimension (freedom, skill development, recognition, support and security) of work quality.

We therefore construct an effort/reward measure of poor job quality. Following Siegrist et al. (2006), we build the effort/reward ratio as the ratio between the items of the effort component and those of the reward component (defined accordingly to our factor analysis) respectively, as shown in the following equation for the generic respondent  $i$ :

$$\frac{effort}{reward}_i = \frac{(stress_i + phys\_demanding_i)/2}{(freedom_i + skills_i + support_i + recognition_i + security_i)/5} \quad (1)$$

As suggested by Siegrist et al. (2006) we then define a dummy variable (“poor job quality”) taking value 1 if the respondent’s ratio is higher than the top tercile of the country-specific distribution.

In the medical literature the distinction is sometimes made between good and bad stress. Good stress should be associated with a positive health effect of work; bad stress, instead, with a negative one. For instance, if stress is compensated by high reward, it can actually be associated with high job quality (e.g. a highly paid manager). We construct the measure of good/bad stress by taking the ratio of stress to the same reward measure that appears in the denominator of equation (1). We then define a “good stress” dummy that takes value 1 if the respondent reports experiencing high stress in her job and the stress/reward ratio is lower than the second tercile of the country-specific distribution, while a “bad stress” dummy takes value 1 if the respondent has high stress and the ratio is higher than the top tercile. Thus the control group are those who do not experience high stress in their job.

## 2.2 Intended early retirement.

The desire to retire as soon as possible is captured by the answer to the question (addressed to respondents who currently work): “*Thinking about your present job, would you like to retire as early as you can from this job?*”. We use as dependent variable a dummy variable that takes value one if the answer to this question is “*Yes*” and zero otherwise to investigate the role played by working conditions on retirement intention.

We focus on employees aged 50 to 59 who were interviewed in waves 1, 2 or 4. In our sample, about 45% of respondents want to retire as soon as possible (ASAP). In most countries individuals aged less than 60 have little opportunity to retire and draw a pension: our selection rule is arguably based on exogenous or at least pre-determined characteristics. The sample is composed of about 10,800 individuals: 48% of them are males, 51% are aged between 50 and 54 and 88% live with a partner. The workers included in the sample have on average long tenure (about 15 years) and have to work 9 to 10 years before reaching official retirement age. The average annual income from employment is about 33,000 Euros and total household income is about 46,600 Euros. The vast majority (almost 70%) has education higher than lower secondary education. Looking at the health status of respondents in the sample, 46% declare to be in good health and only 11% have a partner in bad health.

As far as job quality is concerned, 43% male and 47% female respondents declare to be highly satisfied with their job. This percentage shows high variability among countries: for example in Poland only 25% males are satisfied with their job whereas in Denmark it rises to 60. Less than 20% of workers say that their current job is physically demanding or stressful and the salary is adequate only for 10% of them (with percentages around 2 for Czech Republic and Poland). A lot of heterogeneity emerges for the reward domain: males declare to be less satisfied with the support and recognition received from their work compared to females; Southern and Eastern countries show significantly lower percentages of highly satisfied workers than Continental and Northern countries.

In the left panel of Figure 1 we display the relation between intended early retirement and job quality, which suggests the existence of a strong negative correlation at the country level between these two variables. In the right panel we report the remaining country effects after controlling for demographics and job characteristics: it is clear that the negative correlation remains even if the difference between males and females is controlled for.

**Fig. 1: Correlation between job satisfaction and desire to retire ASAP (left panel: raw data; right panel: net of sampling differences).**

*[FIGURE 1 HERE]*

Source: SHARE wave 1, 2 and 4.

### 2.3 Retirement decision

By exploiting the panel nature of SHARE data we can move from the intention to the decision to retire and investigate the association between working conditions and transitions from employment to either full or partial retirement. Using all four waves of SHARE we first select individuals who were full time employees and aged between 50 and 69 in the time span considered and follow them over time. We then build a year-to-year transition panel containing for each year information on employment status, job characteristics, earnings, household income, health and job satisfaction.

In baseline (in year 2004 or 2006) we have 3,737 workers in the sample (52% are males): these remain in the sample until they transit from employment to partial retirement or from employment to full retirement. The total number of individual-year observations is 14,464. In the period of time in which we follow them (from 2004 to 2011), we observe that 35% males and 30% females transit from full employment to full retirement, whereas 15% males and 14% females transit from full employment to partial retirement. An individual transits into partial retirement either when she

changes from full time to part time job (both within and between jobs) or when she moves from a career job to a bridge job. Following Ruhm (1990) and Cahill et al. (2006) we define a career job as a job started before age 50 and lasted at least 10 years and a bridge job as a short term job that lasts less than 10 years, started at or past age 50 right after a career job. As Brunello and Langella (2013) have shown using SHARE data, bridge jobs are not equally spread in Europe but they turn out to be much less common in Mediterranean countries than in Central and Northern Europe.

We know that Europeans on average retire 2 to 3 years before official retirement age (OECD 2011) and this is true also in our sample. By considering the observed transitions from full employment to full retirement for men, actual retirement age is 2 to 5 years lower than the official one except in the Czech Republic, Sweden, Switzerland and France. This could be due to poor work quality. In Figure 2 we display country averages of the effort-reward ratio versus average years of early retirement, defined as the distance between official retirement age (eligibility age for old age pension) and actual retirement age. There is evidence of a positive relation between retirement decision and perceived work quality but not as clear-cut as in the case of intended early retirement. For example, figure 2 shows that in both Italy and Belgium many people retire early but in Italy the average effort/reward ratio is high, in Belgium it is relatively low.

**Fig. 2: Average years of early retirement and effort-reward ratio by country.**

[FIGURE 2 HERE]

Source: SHARE wave 1, 2 and 4.

### 3. Estimation strategy

In this Section we present the estimation strategies we use to analyse the association of job quality with retirement intention and retirement decision, respectively. We estimate the probability of intended early retirement by a logit model and the probability to transit from employment to full or partial retirement by a multinomial logit model. We exclude from our analysis individuals who transit from employment to other states, such as unemployment and disability. Transitions to employment and disability correspond to 0.8% and 0.3% of the total number of transitions out of full employment respectively.

#### *Retirement intention*

Let  $Y_i^*$  be the latent variable representing the propensity to retire early and  $Y_i$  the observed binomial variable defined as follows:  $Y_i = \begin{cases} 0, & Y_i^* < 0 \\ 1, & Y_i^* \geq 0 \end{cases}$

The estimated model for intended early retirement is specified as follows:

$$Y_i^* = WQ_i'\boldsymbol{\gamma} + OD_i'\boldsymbol{\varphi} + X_i'\boldsymbol{\beta} + \varepsilon_i \quad (2)$$

where  $\varepsilon_i$  follows a logistic distribution.

Standard errors are clustered by country and the model is estimated separately for males and females. The variables of interest are those included in the vector  $WQ$  (work quality measures). We estimate different models varying the set of work quality variables according to the indicators presented above. We control for other determinants of intended early retirement ( $OD$ ), such as

health and institutional characteristics (years to official minimum retirement age). We also control for demographic and household characteristics ( $X$ ), such as age dummies, educational level dummies, marital status, job earnings and tenure, household income, partner's characteristics (employment status, health status and job satisfaction), life expectancy and country dummies.

### *Retirement decision*

To investigate the role of job quality on decision to retire, we specify the following multinomial logit model of the probability to transit from a career job to either full or partial retirement:

$$\log \left( \frac{\pi_{i,j,t+1}}{\pi_{i,j^*,t+1}} \right) = WQ'_{i,t}\gamma_j + OD'_{i,t}\varphi_j + X'_{i,t}\beta_j \quad (3)$$

with  $j^*$  denoting full employment, which is the base outcome.  $\pi_{i,j,t+1}$  is the probability that individual  $i$ , will choose one of the  $j$  outcomes (full employment, partial or full retirement) at time  $t + 1$ . In the same way,  $\pi_{i,j^*,t+1}$  is the probability that the individual will choose the baseline outcome in  $t+1$ . Since each individual stays in the sample until she transits to either partial or full retirement, our analysis follows a discrete duration model approach where, instead of using the typical baseline hazard function (i.e. a function of the number of periods the individual stays in the sample), we capture duration dependence by conditioning on labour market experience.

The set of controls is almost the same as in the previous model to enhance comparability between intention and decision. It is worth noting that covariates are taken at time  $t$  whereas the transition is observed at time  $t+1$ . Also in this case we split the sample among males and females and we include different indicators of work quality. We depart from the previous model specification including in the  $OD$  set two binary variables taking value 1 if the respondent has reached minimum retirement age and official retirement age respectively, 0 otherwise. We also add GDP growth at time  $t$  as an additional control for macro conditions.

## **4. Results**

### **4.1. Desire to retire as soon as possible**

The first two columns of Table 1a (“Extended sample”) and the upper panel of Table 1b present the estimated marginal effects of the logit model of the probability to desire to retire as soon as possible for individuals interviewed in waves 1, 2 and 4, aged 50-59 and working at the time of the interview. Results are presented for different specifications and for men and women separately. The first specification (Table 1a) uses the full set of job satisfaction variables; the second specification (Table 1b, model 2) includes only the overall job satisfaction variable; the third (Table 1b, model 3) includes the “poor job quality” dummy, while the fourth (Table 1b, model 4) uses the “good stress” and “bad stress” dummies. We report marginal effects of the key variables of interest, such as job quality measures. Complete estimation results are available upon request.

Results show that work quality has a significant role on the probability of intended early retirement and this is true for all different measures of job quality we use. For both men and women, respondents reporting poor job quality or experiencing bad stress are more likely to express the desire to retire as soon as possible, while good stress reduces the probability of intended early retirement only for men. More precisely, experiencing poor job quality increases the desire to retire

as soon as possible by about 19% for both men and women; bad stress increases this probability by 13% for men and 16% for women, while good stress reduces the probability of intended early retirement of men by about 5 percentage points. In the same way, high job satisfaction has a strong negative correlation with the intention to retire: for both men and women reporting to be highly satisfied with their job, the probability of intended early retirement is reduced by about 19 percentage points.

When looking at the single components of job quality, having a physically demanding or stressful job (both in the effort domain) has a large effect in increasing the probability of early retirement. On the other hand, receiving recognition (reward domain) is strongly associated with a reduction in the probability of desired retirement. While the impact of summary job quality measures is similar between men and women, the analysis of the single components highlights the fact that what matters for men and women is different. More precisely, for men it is more important to have freedom and receive support (they reduce the probability of intended early retirement by 5 and 9 percentage points respectively), while women are more sensitive to physically demanding jobs (14% increase in the probability of intended retirement for women and 8% for men) and they consider more important to have a job that lets them develop their skills (+10%) and have recognition for their work (+9.5%). The results show some variability in intended early retirement across countries. Among males, Spanish and French workers are more likely to desire to retire as soon as possible compared to the control group (German workers), while being Belgian reduces the probability of desiring early retirement of about 10%. In particular, women living in Italy, Spain and Poland are more keen to retire early, while in continental and northern Europe, women are less likely to desire to retire as soon as possible. Even when interacting country dummies and job quality indicators, women from southern Europe appear to be more sensitive to job quality than others. Among the other determinants of early retirement, institutional characteristics, such as official retirement age, are important only for women. Female workers who have many years to wait before they reach the official retirement age have lower probability of intended early retirement (0.8% decrease for each additional year).

The sample used to estimate the effect of job quality on the desire to retire as soon as possible is different from the one used for the transition analysis presented in the previous Section, therefore the results are not directly comparable. However, when we re-run the analysis on the same sample (see last two columns of Table 1a and lower panel of Table 1b) we obtain results, both in terms of direction and magnitude of the effects, that are qualitatively the same, even though we lose in precision because of the reduced sample size. A formal Chow test fails to reject the null of (pair-wise) structural stability.

#### **4.2. Transition to partial and full retirement**

After analysing the intention to retire, we look at the transition out of the labour market, either to partial or full retirement for individuals who enter the SHARE sample in the first or in the second wave using a year-to-year transition panel. Table 2 presents the multinomial logit relative risk ratios for the relevant variables, while Table 3 presents marginal changes in probability for the two states (partial retirement and full retirement) associated with changes in job quality measures variables and the country dummies. In line with what we have shown for intended retirement, we run separate analyses for men and women and for different quality measures. Model (1) specification includes



the ‘high job satisfaction’ dummy, model (2) uses the ‘poor job quality’ indicator, while model (3) includes the ‘good stress’ and the ‘bad stress’ dummies.

Our estimates show that work quality plays a very different role when we focus on actions rather than on intentions. In general, high job satisfaction is associated with higher probability to transit to partial retirement for women (+1%) and lower probability to transit into full retirement for men (-2%). Poor job quality, instead, increases the probability of full retirement for male workers by about 1.5 percentage points. Good and bad stress have in general no role on transitions out of the labour market, except for marginally reducing the probability of partial retirement of male workers (-1%). When looking at the single components of job quality (for which we do not report the relative risk ratios) no clear pattern is detected unlike what we found for intended early retirement. The results shows a certain degree of variability by country for both men and women, in particular for the transitions to full retirement. This is mainly due to different characteristics of pension systems and diffusion of forms of partial retirement, such as bridge jobs. In order to capture the differential effect of job quality by country, we interact the job quality measures with the country dummies. Results (that we do not report to save space) show that, as we saw for the intended early retirement, for women living in the Southern countries (and to a certain extent also in Eastern countries) job quality has stronger effects for transitions to partial or full retirement (e.g. in Spain being highly satisfied increases the probability of both partial and full retirement by 5%).

We find no differential effect of job quality by years before or after minimum retirement age (i.e. when combining the job quality measures and the number of years to/from minimum retirement age, the interaction term is not significantly different from 0) and this should rule out the possibility that the estimate of the job quality effect is affected because some people are too young to retire.

In the analysis of actual transitions the sample includes individuals who work past the earliest retirement age who are instead excluded in our analysis of the intention to retire. This difference in the sample composition can jeopardize the comparability of the estimated effects of the work quality measures on retirement intentions and behaviour. More specifically, the estimated effects of work quality on retirement decisions might be partly shaped by correlations between the relevant variables for people who work past the earliest possible retirement age. To address this concern, we estimate a logit model where the outcome variable is the probability to retire at the earliest possible age (i.e. statutory minimum retirement age), dropping from the sample individuals older than the statutory retirement age. The results obtained are qualitatively the same as the ones from the multinomial logit estimation.

Given the age range considered and the heterogeneity in labour market participation rates in the group of countries analysed, sample selection bias might affect our results. In fact, we might be excluding from our sample individuals with very poor job quality that already exited the labour market either through retirement or through other pathways, such unemployment or disability. To investigate this issue, we first look at the correlation between employment rates (by age and gender) and the percentage of individuals satisfied with their jobs by country and gender (see Figure 3).

**Fig 3: Correlation between employment rates and high job satisfaction by country and gender.**

*[FIGURE 3 HERE]*

Source: SHARE wave 1, 2 and 4 and Eurostat.

The graph shows indeed that in countries where the employment rate is higher there is a higher percentage of individuals highly satisfied with their jobs. And this correlation is particularly strong for women. If we assume that all individuals have the same sensitivity to job quality, we can argue that the sample selection in our analysis leads to an underestimation of the effect of job quality on the probability to transit out of full employment. However, if this assumption is not true, the sign of the bias is indeterminate. We also check how many individuals in our baseline sample are unemployed or disabled and their distribution by country, since in some countries one can exit the labour market before retirement through disability or unemployment. In our sample, we observe that 8% of individuals are either unemployed or disabled. They are mainly concentrated in the Netherlands, Sweden, France, Germany and Denmark. To test if our results are affected by this heterogeneity in pathways to retirement, we re-run our estimations excluding each of these countries in turn. The results are qualitatively the same, even if we lose precision due to reduced sample size.

Another type of bias that might affect our results is justificatory reporting bias. In the literature (Bound 1991, Dwyer and Mitchell 1999, Disney et al. 2006), there is a concern about the use of self-reported measures, in particular for health, to explain retirement decisions. The general concern is that the responses to subjective judgements may not be independent of the labour market outcome they are used to explain (Bound 1999) and this can lead to an over estimation of their effect on the outcome of interest. In our analysis the effect of self-reported job quality on retirement behaviour may be exaggerated by individuals reporting worse job quality conditions to justify their exit from the labour market. Unfortunately, we cannot implement an estimation strategy that can deal with justification bias. However, since the work quality variables we used are measured in the period prior to the exit from the labour market, justificatory reporting bias should be attenuated.

## **5. Conclusion**

In this paper we analysed the role played by work quality both on the desire to retire as soon as possible and on transitions out of the labour market, using different measures of job quality. We find a strong and consistent (across different measures) association of poor quality of work with intended early retirement and (to a lower extent) with transitions to either partial or full retirement. The different strength of the role played by perceived work quality on intention and actual retirement is confirmed when we make the estimation samples as comparable as possible, and is suggestive of the possibility that actual transitions into retirement may be driven not only by intentions, but also by changes in circumstances and opportunities. One should keep in mind that some transitions may be induced by firms – something we cannot control for in our estimation – and others by a negative health shock to a parent or parent in law.

The importance of work quality once we control for health and pension system characteristics relates to the issue of workability for senior workers. To the extent that poor job quality is a factor influencing the willingness to work by the “young-old”, raising the perceived work quality of this age group becomes a key policy issue.

It is possible that generous retirement schemes in place until recently in many European countries, together with seniority-related pay schedules and rigidities in work arrangements, contributed to deteriorate the quality of employer-employee match by reducing the incentives for employers to train their mature workforce (Hairault et al, 2010). The need to retain workers until an older age

may induce firms to increase training of older workers. Other possible solutions may have to do with changing work arrangements, allowing for flexible working hours and partial retirement, or making bridge jobs more easily available (Brunello and Langella 2013).

Our empirical results and their policy implications call for more research on how workers' training and work arrangements can effectively enhance job satisfaction of older workers and their participation in the labour market.

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## Tables and Figures

**Table 1a: Logit marginal effects on the probability to desire to retire as soon as possible. Work quality single items. Extended and comparable sample.**

Variables	Extended Sample				Comparable Sample			
	Males		Females		Males		Females	
Physically demanding	0.078	***	0.139	***	0.048		0.138	***
	(0.028)		(0.021)		(0.035)		(0.026)	
Stress	0.106	***	0.096	***	0.138	***	0.114	***
	(0.021)		(0.015)		(0.027)		(0.024)	
Freedom	-0.050	**	-0.021		-0.070	***	-0.024	
	(0.023)		(0.013)		(0.019)		(0.023)	
Skills development	-0.027	*	-0.104	***	-0.047	**	-0.093	***
	(0.016)		(0.019)		(0.023)		(0.028)	
Support	-0.086	***	-0.032		-0.097	***	-0.054	***
	(0.021)		(0.022)		(0.034)		(0.016)	
Recognition	-0.064	***	-0.094	***	-0.047		-0.042	
	(0.023)		(0.034)		(0.046)		(0.035)	
Adequate salary	-0.031		0.001		-0.046		0.030	
	(0.030)		(0.025)		(0.043)		(0.039)	
Career prospects	-0.006		-0.024		0.064		-0.034	
	(0.039)		(0.018)		(0.056)		(0.036)	
Job security	-0.001		-0.021		0.020		0.001	
	(0.013)		(0.021)		(0.028)		(0.031)	
N. Obs.	5248		5559		2161		2344	

Note: Clustered (by country) standard errors in parentheses. \*, \*\*, \*\*\* correspond to 10%, 5%, 1% significance level respectively. Table presents logit marginal effects of the probability to desire to retire as soon as possible. The “extended sample” is composed by all individuals aged 50-59 who were interviewed in waves 1, 2 and 4 and were currently working. The “comparable sample” (the same used in the multinomial logit analysis presented in Table 2) is composed by workers who enter the SHARE sample in the first or second wave, and were interviewed in all SHARE waves. Blue collar-low skilled, agriculture, age 55-59 (or 60-64), upper secondary education and Germany are used as baseline. Complete estimation results (including country dummies) are available upon request.

**Table 1b: Logit marginal effects on the probability to desire to retire as soon as possible. Work quality measures. Extended and comparable sample.**

Variables	High job satisfaction (Model 2)		Poor job quality (Model 3)		Good and bad stress (Model 4)	
	Males	Females	Males	Females	Males	Females
	<i>Extended Sample</i>					
High job satisfaction	-0.194 *** (0.018)	-0.198 *** (0.017)				
Poor job quality			0.187 *** (0.018)	0.194 *** (0.016)		
Good stress					-0.045 *** (0.012)	-0.033 (0.028)
Bad stress					0.135 *** (0.012)	0.164 *** (0.014)
N.Obs.	5248	5559	5248	5559	5248	5559
	<i>Comparable Sample</i>					
High job satisfaction	-0.215 *** (0.019)	-0.213 *** (0.017)				
Poor job quality			0.214 *** (0.023)	0.197 *** (0.027)		
Good stress					-0.025 (0.043)	-0.042 (0.054)
Bad stress					0.135 *** (0.018)	0.167 *** (0.029)
N. Obs.	2161	2344	2161	2344	2161	2344

Note: Clustered (by country) standard errors in parentheses. \*, \*\*, \*\*\* correspond to 10%, 5%, 1% significance level respectively. Table presents logit marginal effects of the probability to desire to retire as soon as possible. The “extended sample” is composed by all individuals aged 50-59 who were interviewed in waves 1, 2 and 4 and were currently working. The “comparable sample” (the same used in the multinomial logit analysis presented in Table 2) is composed by workers who enter the SHARE sample in the first or second wave, and were interviewed in all SHARE waves. Blue collar-low skilled, agriculture, age 55-59 (or 60-64), upper secondary education and Germany are used as baseline. Complete estimation results (including country dummies) are available upon request.



**Table 2: Multinomial logit estimates of the probability to transit to partial or full retirement. Relative risk ratios. Relevant variables.**

Variables	Model (1)		Model (2)		Model (3)	
	Males	Females	Males	Females	Males	Females
<i>Partial Retirement</i>						
High job satisfaction	1.031 (0.146)	1.471 (0.221)				**
Poor job quality			0.958 (0.159)	0.894 (0.155)		
Good stress					0.668 (0.156)	* (0.204)
Bad stress					1.014 (0.154)	0.830 (0.140)
Reach minimum retirement age	0.667 (0.169)	0.713 (0.189)	0.666 (0.169)	0.720 (0.190)	0.668 (0.170)	0.714 (0.189)
Reach maximum retirement age	0.811 (0.361)	1.164 (0.459)	0.783 (0.351)	1.174 (0.462)	0.811 (0.363)	1.173 (0.461)
Austria	0.321 (0.336)	1.02e-06 (0.000537)	0.323 (0.338)	3.57e-07 (0.00031)	0.303 (0.317)	3.69e-07 (0.000326)
Sweden	0.653 (0.234)	0.771 (0.292)	0.650 (0.234)	0.757 (0.286)	0.591 (0.215)	0.759 (0.289)
Spain	0.823 (0.297)	1.167 (0.486)	0.822 (0.296)	1.132 (0.470)	0.724 (0.265)	1.114 (0.467)
Italy	1.338 (0.551)	1.783 (0.939)	1.324 (0.544)	1.579 (0.828)	1.208 (0.499)	1.578 (0.830)
Denmark	1.707 (0.775)	2.94 (1.362)	1.708 (0.775)	2.839 (1.315)	** 1.613 (0.735)	2.832 (1.314)
Switzerland	1.889 (0.655)	* 2.111 (0.774)	** 1.886 (0.653)	* 2.166 (0.790)	** 1.685 (0.592)	2.154 (0.793)
Belgium	0.993 (0.323)	1.184 (0.426)	0.993 (0.323)	1.185 (0.425)	0.905 (0.298)	1.181 (0.426)
France	0.527 (0.206)	0.570 (0.241)	0.528 (0.206)	0.584 (0.247)	0.507 (0.199)	* 0.575 (0.244)
the Netherlands	2.529 (0.866)	*** 2.029 (0.813)	* 2.532 (0.867)	*** 2.015 (0.805)	* 2.319 (0.801)	** 1.997 (0.801)
Czech Republic	1.833 (0.769)	1.185 (0.577)	1.828 (0.767)	1.163 (0.565)	1.705 (0.718)	1.170 (0.569)
Poland	0.425 (0.215)	* 0.611 (0.327)	0.423 (0.214)	* 0.622 (0.333)	0.394 (0.200)	* 0.614 (0.329)
<i>Full Retirement</i>						
High job satisfaction	0.671 (0.070)	*** 0.991 (0.113)				
Poor job quality			1.280 (0.145)	** 1.182 (0.148)		

Good stress								0.845	0.887	**		
								(0.131)	(0.151)			
Bad stress								1.181	1.180	***		
								(0.128)	(0.146)			
Reach minimum retirement age	5.19	***	5.829	***	5.12	***	5.838	***	5.129	***	5.871	***
	(0.733)		(0.990)		(0.723)		(0.991)		(0.725)		(0.996)	
Reach maximum retirement age	4.178	***	2.954	***	4.179	***	2.998	***	4.163	***	3.012	***
	(0.621)		(0.464)		(0.621)		(0.472)		(0.618)		(0.474)	
Austria	2.042	**	2.355	**	1.953	**	2.361	**	1.916	**	2.277	***
	(0.604)		(0.983)		(0.577)		(0.984)		(0.567)		(0.953)	
Sweden	0.288	***	0.228	***	0.307	***	0.227	***	0.276	***	0.218	***
	(0.0691)		(0.060)		(0.074)		(0.0599)		(0.067)		(0.058)	
Spain	0.575	**	0.361	***	0.633	**	0.367	***	0.575	**	0.351	***
	(0.131)		(0.114)		(0.144)		(0.116)		(0.133)		(0.113)	
Italy	0.402	***	0.276	***	0.477	***	0.282	***	0.433	***	0.272	**
	(0.116)		(0.132)		(0.137)		(0.135)		(0.125)		(0.130)	
Denmark	1.344		0.366	***	1.440		0.358	***	1.368		0.354	***
	(0.355)		(0.114)		(0.380)		(0.112)		(0.363)		(0.111)	
Switzerland	1.295		0.579	**	1.369		0.58	**	1.276		0.56	***
	(0.305)		(0.155)		(0.322)		(0.155)		(0.305)		(0.151)	
Belgium	0.51	***	0.423	***	0.507	***	0.423	***	0.474	***	0.41	
	(0.115)		(0.107)		(0.114)		(0.107)		(0.108)		(0.105)	
France	0.355	***	0.175	***	0.356	***	0.175	***	0.331	***	0.167	
	(0.095)		(0.058)		(0.095)		(0.058)		(0.089)		(0.056)	
the Netherlands	2.015	***	0.744		2.066	***	0.737		1.95	***	0.725	
	(0.433)		(0.203)		(0.444)		(0.201)		(0.424)		(0.199)	
Czech Republic	0.613	*	1.279		0.682		1.286		0.648		1.267	
	(0.171)		(0.403)		(0.189)		(0.405)		(0.180)		(0.401)	
Poland	0.447	**	0.843		0.474	**	0.863		0.444	**	0.830	
	(0.166)		(0.322)		(0.177)		(0.330)		(0.166)		(0.320)	
N. Obs.	7524		6940		7524		6940		7524		6940	

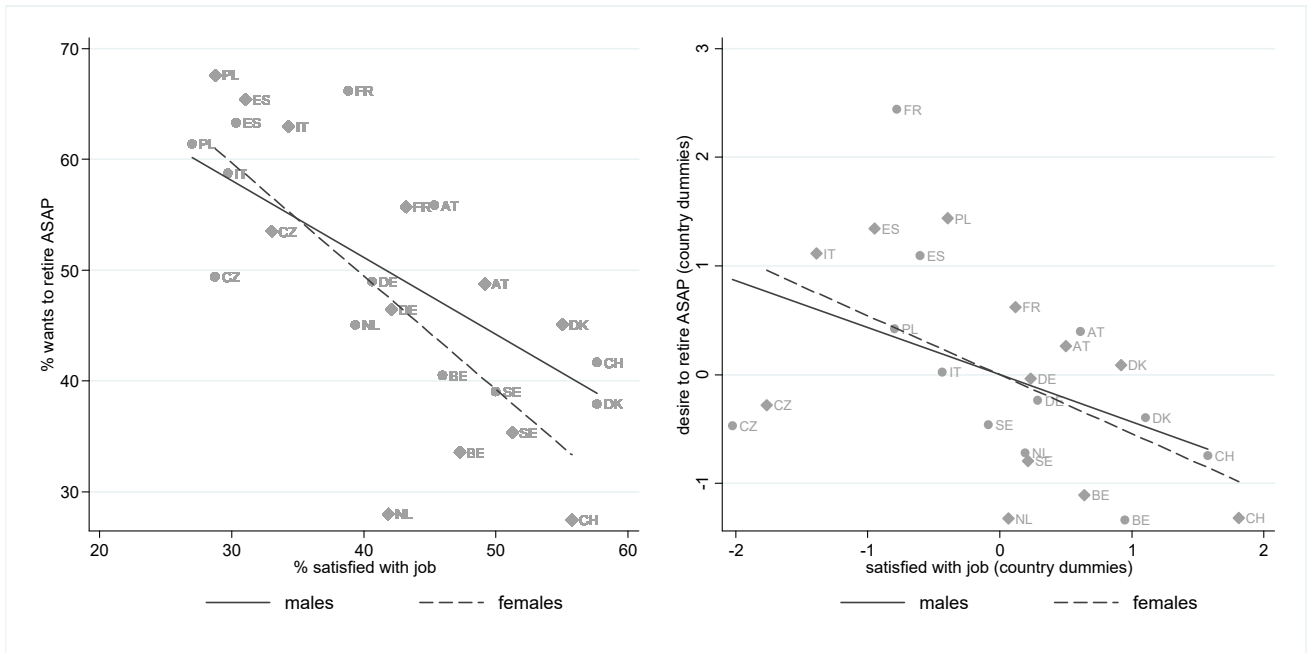
Note: Standard errors in parentheses. \*, \*\*, \*\*\* correspond to 10%, 5%, 1% significance level respectively. Table presents multinomial logit Relative Risk Ratio of the probability to transit to partial or full retirement. Blue collar-low skilled, agriculture, age cohort 1950-1954, upper secondary education and Germany are used as baseline.

**Table 3: Marginal changes in probability to transit to partial or full retirement. Relevant variables.**

Variables	Model (1)		Model (2)		Model (3)	
	Males	Females	Males	Females	Males	Females
	<i>Partial Retirement</i>					
Baseline probability	0.036	0.033	0.036	0.033	0.036	0.033
High job satisfaction	0.002	0.011				
Poor job quality			-0.002	-0.003		
Good stress					-0.010	-0.002
Bad stress					0.000	-0.005

Reach minimum retirement age	-0.016	-0.012	-0.016	-0.012	-0.016	-0.012
Reach maximum retirement age	-0.010	0.002	-0.010	0.002	-0.010	0.002
Austria	-0.023	-0.034	-0.023	-0.034	-0.024	-0.034
Sweden	-0.009	-0.005	-0.009	-0.006	-0.012	-0.005
Spain	0.012	0.023	0.011	0.017	0.008	0.017
Italy	0.018	0.047	0.018	0.045	0.015	0.045
Denmark	0.001	0.006	0.001	0.006	-0.001	0.006
Switzerland	-0.014	-0.012	-0.014	-0.011	-0.015	-0.012
Belgium	0.033	0.026	0.033	0.026	0.029	0.025
France	0.022	0.027	0.021	0.028	0.017	0.028
the Netherlands	-0.004	0.006	-0.005	0.005	-0.008	0.005
Czech Republic	0.024	0.005	0.023	0.004	0.020	0.004
Poland	-0.018	-0.012	-0.018	-0.011	-0.020	-0.011
	<i>Full Retirement</i>					
<i>Baseline probability</i>	<i>0.086</i>	<i>0.072</i>	<i>0.086</i>	<i>0.072</i>	<i>0.086</i>	<i>0.072</i>
High job satisfaction	-0.023	-0.001				
Poor job quality			0.015	0.009		
Good stress					-0.009	-0.006
Bad stress					0.010	0.009
Reach minimum retirement age	0.118	0.095	0.117	0.096	0.117	0.096
Reach maximum retirement age	0.120	0.066	0.120	0.067	0.120	0.067
Austria	0.052	0.055	0.049	0.055	0.047	0.052
Sweden	-0.056	-0.057	-0.054	-0.057	-0.058	-0.058
Spain	-0.044	-0.046	-0.024	-0.045	-0.041	-0.046
Italy	0.017	-0.041	-0.037	-0.042	0.018	-0.042
Denmark	-0.035	-0.037	-0.035	-0.037	-0.038	-0.038
Switzerland	-0.047	-0.057	-0.047	-0.057	-0.049	-0.057
Belgium	-0.043	-0.015	0.045	-0.015	0.041	-0.016
France	0.014	-0.025	0.018	-0.025	0.013	-0.026
the Netherlands	-0.029	-0.040	-0.024	-0.039	-0.028	-0.040
Czech Republic	-0.027	0.012	-0.022	0.013	-0.024	0.012
Poland	-0.038	-0.007	-0.035	-0.006	-0.038	-0.008

**Fig. 1: Correlation between job satisfaction and desire to retire ASAP (left panel: raw data; right panel: net of sampling differences).**



**Fig. 2: Average years of early retirement and effort-reward ratio by country.**

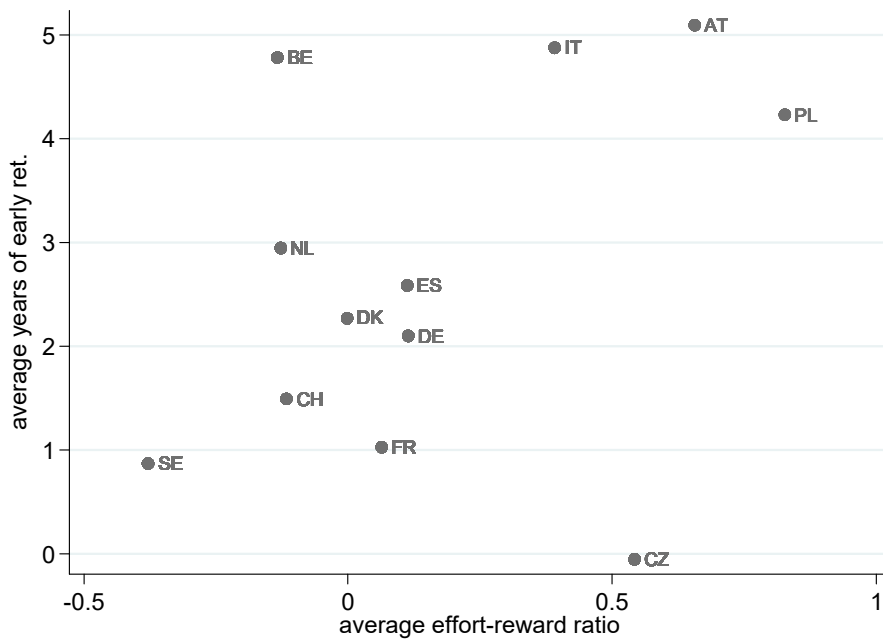


Fig 3: Correlation between employment rates and high job satisfaction by country and gender.

