

# WORKING PAPER

## DETERMINANTS OF INVOLUNTARY EMPLOYMENT IN EUROPE

Lieze Sohier  
Luc Van Ootegem  
Elsy Verhofstadt

February 2019  
2019/956

# Determinants of involuntary employment in Europe

Lieze Sohler, Luc Van Ootegem and Elsy Verhofstadt

**Abstract** The worker's perception of a forced decision to work (i.e. involuntary employment) has a negative effect on the overall well-being of the older worker (aged 50 and above). This paper first investigates the job situation, the financial and health situation and the relationship status of the involuntary workers. The micro data of the Survey of Health, Ageing and Retirement in Europe (SHARE) allows for panel estimations. We control for unobserved differences in personality traits between voluntary and involuntary workers. We find that the job situation of the worker and the retirement of the partner are important drivers of involuntary employment. Specifically, involuntary workers are more frequently employed in jobs that are physically demanding or that have more stress related tasks. Involuntary workers also often feel underappreciated for their work by the management or colleagues. Second, we focus on cross-country differences. The fraction of involuntary workers in the labor population aged 50 and more ranges from 29 percent in Switzerland to 62 percent in Spain. We find that in the countries with the lowest rates of involuntary employment, the involuntary workers have better working conditions and are more easily able to make ends meet. Furthermore, the country dummies in our estimations indicate that the probability of being involuntarily employed is partly explained by time-invariant factors that differ across countries, for example public policies, e.g. pension systems. We investigate cross-country differences in four aspects of the pension system. The countries with the lowest rates of involuntary employment are those with the highest rates of partial and joint retirement.

**Keywords** older workers · involuntary employment · longer working careers · aging

**JEL** J26 · J28

## Introduction

An important life decision for the older worker (aged 50 and above) is when to retire. Retiring will change various aspects of life such as social life or income. This paper investigates the degree of voluntariness in the older worker's decision to continue working. Involuntary employment is defined as the worker's perception of being forced to continue working (Sohier, 2018). The definition is based on the concept of involuntary retirement or the retiree's perception about the degree of voluntariness in his decision to retire (Szinovacz & Davey, 2005; Van Solinge & Henkens, 2007). Our concept of involuntary employment is subjective as we measure the perception of a decision. We assume that older workers evaluate the options (to continue working or to retire) in their choice set. The outcome or the situation (i.e. being employed) is then observed, but we are unable to identify the decision to continue working as the preferred choice. It could also be the case that the alternative option of retiring was preferred but that the older worker was constrained in his or her choice set (Botti, 2004; Sen, Muellbauer, Kanbur, Hart, & Williams, 1987). The latter serves as an example of involuntary employment.

Freedom of choice plays an important role in how people evaluate their lives, i.e. their overall well-being (Bavetta & Navarra, 2012). Sohier (2018) found a negative effect of being involuntarily employed on the overall level of well-being of older workers. In employment, involuntary workers experience a lower level of life satisfaction than voluntary workers (Sohier, 2018). When retiring, involuntary workers report an increase in their well-being level. Retirement is felt as a relief from their previous employment situation. Furthermore, she found large cross-country differences in the share of involuntary workers in the employed population aged 50 and above. In the sample that Sohier (2018) analyzes (the Survey of Health, Ageing and Retirement in Europe, SHARE, 2006-2013), 30.5 percent of the older workers in Switzerland and 61.9 percent of the older workers in Spain are involuntarily employed. The findings of Sohier (2018) motivate our two research questions: which personal factors increase the likelihood of being involuntarily employed (and therefore having a lower level of well-being) and which factors can explain the large cross-country differences.

The first objective of this paper is to identify the personal factors that influence involuntary employment. We select personal factors based on the literature on the intention to continue working (e.g. Schalk & Desmette, 2015; Shacklock & Brunetto, 2011) and on the intention to (voluntarily) retire (e.g. Wang & Shultz, 2010). The type of work and personal fulfillment at work are important factors of the worker's intention to continue working. Other factors are the financial situation, the work environment and the health of the worker and his or her relatives (Shacklock, Brunetto, & Nelson, 2009). Factors intrinsic to the work such as job recognition, responsibilities, achievements or challenges are (also) important for work motivation and job satisfaction (Herzberg, Mausner, & Snyderman, 2011). Employees might postpone early retirement when they anticipate to work in a challenging and rewarding work environment (Van Dam, Van der Vorst, & Van der Heijden, 2009). Older workers may be unwilling to stay in stressful or dissatisfying jobs (Szinovacz & Davey, 2005). The attitude in the close social environment (partner or colleagues) influences retirement planning (Desmette & Gaillard, 2008; Nilsson, Hydbom, & Rylander, 2011). The relationship status also influences retirement behavior as spouses like to retire simultaneously (Henkens, 1999). The decision to retire is frequently made at the household level instead of the individual level (Coile, 2004; Gustafson, 2017). The above-mentioned literature identifies factors that determine the older worker's preference between the two options (to continue working or to retire) in his or her choice set. It does not necessarily discuss the voluntariness of the decision or whether the observed outcome (e.g. to continue

working) was the preferred option. There is literature that has investigated the degree of involuntariness in the decision to retire. Involuntary retirement is defined as the retiree's perception of a forced decision to retire (Szinovacz & Davey, 2005, p. 36; Van Solinge & Henkens, 2007, p. 295). It is generally assumed that involuntary retirement stems from health constraints or from being fired (e.g. Herzog, House, & Morgan, 1991; Isaksson & Johansson, 2000). A negative perception of the decision to retire can also arise if the individual has no control over his decision (Van Solinge & Henkens, 2007). For example, pressure to retire that comes from colleagues, management or partner can lead to a situation in which the older worker feels that he or she had no choice in the decision to retire. Some statements about the working conditions of the worker's job capture the appreciation of the management and colleagues for the work of the older worker (see data section *infra*). We will also take into account the relationship status of the older worker and if there is a partner, we also look at his or her work status.

This study considers the job situation, the physical and mental health, the financial situation and the partner's work status as personal determinants of involuntary employment. Additionally, we take into account the older worker's expectations about when he or she will retire. These expectations are captured by the probability of being retired for a certain age, gender and country and by the number of years until being eligible for pension benefits. The expectations can influence our estimations in two ways. First, as the likelihood to retire increases, the older worker's preference to retire (instead of to continue working) can increase. Consequently, this can increase the degree of involuntariness in the decision to continue working. Second, a less favorable situation (for example, low-quality job or poor financial situation) could increase involuntary employment more if the likelihood to retire is low. By taking into account when people expect to retire, we can compare the job situation (and other personal factors) between voluntary and involuntary workers with an equal likelihood to retire.

The data is taken from SHARE – Survey of Health, Ageing and Retirement in Europe, which contains detailed longitudinal micro data of European citizens aged 50 and above over the period 2004-2013. The data allows panel estimations as we have at least two observations for all respondents. We control for unobserved differences in personality traits between voluntary and involuntary workers (unobserved heterogeneity). The estimation technique is Mundlak's correction of the random effects logit regression. The random effects logit estimator takes into account unobserved heterogeneity and the binary character of the dependent variable (i.e. being voluntarily or involuntarily employed). It assumes that there is no correlation between the (time-invariant) individual effects and the explanatory variables. This assumption is, however, difficult to hold and it would produce inconsistent estimates. Mundlak's correction eases this strong assumption (see methodology section *infra*).

The second aim of this paper is to focus on cross-country differences in the percentage of involuntary workers in the labor population aged 50 and above. Our sample consists of employed citizens from nine European countries (Austria, Belgium, Denmark, France, Germany, Netherlands, Spain, Sweden and Switzerland). The rate of involuntary employment differs greatly between these countries. Can differences in working conditions (or other observable personal factors of involuntary employment) between the countries explain this discrepancy? Or is there an explanation to be found in the different public policies, e.g. pension systems? The first question is investigated by a descriptive cross-country comparison of the personal factors that are significant in the empirical estimations. The second question is examined by an

evaluation of the pension plans based on the expectations to retire before the official retirement age, the financial attractiveness of the pension benefits and the possibilities of partial and joint retirement.

## Methodology

Being voluntarily or involuntarily employed is a binary issue that may depend on many (observed and unobserved) personal factors. The observed variable  $y_{it}$  is equal to 1 if individual  $i$  at time  $t$  expresses himself or herself as being involuntarily employed, and equal to 0 if the individual expresses himself or herself as being voluntarily employed. The individual's answer is assumed to reflect a continuous latent variable  $y_{it}^*$  which we define by the following equation:

$$y_{it}^* = \alpha_0 + X_{it}'\beta + v_{it}$$

$$y_{it} = 1 \text{ if } y_{it}^* > 0 \quad \text{and} \quad y_{it} = 0 \text{ otherwise}$$

$$v_{it} = \mu_i + \lambda_{ct} + \varepsilon_{it}$$

In this equation,  $X_{it}$  is a vector of explanatory variables that varies across individuals  $i$  and over time  $t$ .  $\lambda_{ct}$  denotes an interaction between the country dummies (country-level  $c$ ) and the time dummies (time  $t$ ) in order to capture country-specific time effects.  $v_{it}$  is the error term which contains, in case of unobserved heterogeneity, individual-specific time-invariant effects  $\mu_i$ .  $\varepsilon_{it}$  is the error term with zero mean.

The random effects logit estimator takes into account the binary character of the dependent variable and unobserved heterogeneity. Voluntary and involuntary workers can differ in (unobserved) personal characteristics. For example, involuntary workers are likely to be less motivated and more pessimistic than voluntary workers. These (unobserved and time-invariant) individual effects are difficult to capture and are therefore often overlooked in the analysis but it can lead to inefficient estimates. The random effects logit estimator assumes that these individual effects are not correlated with the explanatory variables in the regression. This assumption is, however, difficult to make as all variables are self-reported. For example, pessimistic respondents likely underrate their financial or health situation. This could lead to inconsistent estimates. A (conditional) fixed effect logit estimation approach is no alternative as this approach would reduce the sample severely.<sup>1</sup>

A better approach to deal with this type of correlation is Mundlak's correction of the Random Effects Logit estimation. This correction comes down to adding the individual means of all time-varying variables to the regression (Mundlak, 1978). In our regression model, the individual means of all time-varying explanatory

---

<sup>1</sup> Using a fixed effects logit regression is no solution as the estimates of the individual effects are biased and poorly estimated when the number of time periods is small. This problem is known as the incidental parameter problem. The poor estimates of the individual effects then contaminate the rest of the coefficients estimated through the maximum likelihood estimation procedure (Greene, 2004). A solution is to eliminate the individual effects by conditioning the probability of the dependent variable for each respondent on the number of observations for which the respondent is involuntarily employed (Chamberlain, 1980; Greene, 2012). In this way, the conditional probability does not include individual effects and therefore they are no longer estimated when the resulting conditional likelihood estimator is estimated. One important drawback of this method is that it drops respondents that are involuntarily (or voluntarily) employed in each observation. These respondents do not provide any information as the conditional probability is one. In this way, only the older workers who made the transition from voluntary to involuntary employment and the reverse transition are included in the estimated sample. This reduces sample size severely.

variables are denoted as  $\bar{X}_i$ . The individual effects  $\mu_i$  are assumed to be linear in the individual means, represented by following equation:

$$\mu_i = \theta_0 + \delta \bar{X}_i + e_i$$

where  $e_i$  is the individual effect with  $e_i \sim N(0, \sigma^2)$  and not correlated with the explanatory variables  $X_{it}$ . Any correlation between the (unobserved) individual effects and the included explanatory variables is reflected in the individual means and therefore taken out of the error term. Correlation between the included explanatory variables and the error term (through the individual effects) is then no longer possible.

In contrast to the (conditional) fixed effects logit approach, the individual effects are not eliminated but we made some restrictions on the distribution of the individual effects. The individual effects that are not correlated with the time-varying explanatory variables (not captured in the individual means) are not removed from the error term by Mundlak's correction. This is not a problem as they are treated as part of the error term ( $e_i \sim N(0, \sigma^2)$ ). Mundlak's correction of the random effects logit approach allows us to estimate the effect of time-constant variables but the cross-sectional variation is reduced by the inclusion of the individual means (reflects the correlation between the individual effects and the time-varying explanatory variables). The estimates of the explanatory variables  $X_{it}$  are largely identified by the variation over time (within-variation).

The main explanatory variables in this estimation are the working conditions, the physical and mental health situation, the financial situation and the work status of the partner. Using Mundlak's correction of the random effects logit estimation approach, we estimate the effect of a change in these explanatory variables on the probability on being involuntarily employed, while taking into account unobserved heterogeneity and the binary character of the dependent variable. In addition, the individual expectations to retire are included in order to compare the working conditions and other personal factors between voluntary and involuntary workers with an equal likelihood to retire.

## Data

SHARE contains detailed longitudinal micro data on physical and mental health, socio-economic status, and social and family networks of European citizens aged 50 and above (Börsch-Supan & Alcer, 2005; Börsch-Supan et al., 2013). This study uses the first (2004-2005), second (2006-7), fourth (2011) and fifth (2013) observation period and includes the countries that have observations in all four observation periods, i.e. Austria, Belgium, Denmark, France, Germany, Netherlands, Spain, Sweden and Switzerland.<sup>2</sup> The sample includes older workers who are at least 50 years and are either voluntarily or involuntarily employed. The sample consists of 19,923 observations of 8,410 respondents. Each respondent in the sample has at least two observations (71.95% of the respondents have two observations, 19.20% three observations and 8.85% four observations). SHARE provides weights based on region, age group and sex, separately for each country and for each observation period (Abduladze, Malter, & Börsch-Supan, 2013; Malter & Börsch-Supan, 2015). The descriptive statistics in this section are weighted using the SHARE weights.

Involuntary employment (i.e. the older worker's perception of being forced to continue working) is approximated by the response to the following binary question: *'Thinking about your present job, would*

---

<sup>2</sup> The third observation period (2008-9) is special as it focuses on people's life history (SHARELIFE).

**Table 1:** Characteristics of involuntary workers.  $N = 19,923$  ~ weighted data

	Voluntary workers	Involuntary workers
% are female	47.97 %	43.75 %
Age (in years)	$M = 56.78$ ( $SD = 4.10$ )	$M = 56.05$ ( $SD = 3.31$ )
Average number of years of schooling	$M = 13.50$ ( $SD = 4.31$ )	$M = 12.38$ ( $SD = 3.99$ )
% are married and live together	69.39 %	73.48 %
% have a registered partnership	1.99 %	1.42 %
% are married and live separately	2.57 %	1.58 %
% are never married	8.53 %	9.06 %
% are divorced	13.08 %	10.71 %
% are widowed	4.44 %	3.76 %
% are employed in the private sector	62.79 %	67.39 %
% are civil servants	17.51 %	19.61 %
% are self-employed	19.70 %	12.99 %
% work more than 30 h a week	79.25 %	86.09 %
% are employed with a short-term contract (less than 3 years) <sup>(1)</sup>	12.28 %	6.44 %
% are employed as ‘legislator, senior official or manager’ <sup>(2)</sup>	12.91 %	10.71 %
% are ‘professional’	15.50 %	8.08 %
% are ‘technician or associate professional’	12.31 %	14.34 %
% are ‘clerk’	15.05 %	15.90 %
% are ‘service worker and shop and market sales’	25.24 %	18.23 %
% are ‘skilled agricultural or fishery worker’	2.94 %	3.95 %
% are ‘craft and related trades worker’	7.61 %	14.08 %
% are ‘plant and machine operator or assembler’	1.88 %	6.72 %
% are in ‘elementary occupation’	6.33 %	7.77 %
% are in ‘armed forces’	0.23 %	0.22 %
% are employed in sector ‘agriculture, hunting, forestry and fishing’ <sup>(3)</sup>	4.78 %	4.63 %
% in ‘mining and quarrying’	0.44 %	0.81 %
% in ‘manufacturing’	8.99 %	12.69 %
% in ‘electricity, gas and water supply’	1.59 %	1.98 %
% in ‘construction’	4.91 %	8.35 %
% in ‘wholesale and retail trade’	10.20 %	9.96 %
% in ‘hotels and restaurants’	2.09 %	2.78 %
% in ‘transport, storage and communication’	4.89 %	5.14 %
% in ‘financial intermediation’	3.00 %	4.69 %
% in ‘real estate, renting and business activities’	3.51 %	1.44 %
% in ‘public administration and defense’	8.19 %	13.67 %
% in ‘education’	13.37 %	7.75 %
% in ‘health and social work’	17.73 %	12.19 %
% in ‘other community, social and personal service activities’	16.32 %	13.91 %
Work index (between 9 and 36) <sup>(4)</sup>	$M = 25.67$ ( $SD = 3.72$ )	$M = 23.46$ ( $SD = 3.99$ )
% have great difficulty to make ends meet	3.48 %	5.99 %
% have some difficulty to make ends meet	17.39 %	24.02 %
% can fairly easily to make ends meet	35.21 %	37.71 %
% can easily to make ends meet	43.91 %	32.29 %
Average health [1 = excellent, 5 = poor]	$M = 2.53$ ( $SD = 0.93$ )	$M = 2.86$ ( $SD = 0.95$ )

**Note:** The 8,410 respondents are aged 50 and above and are either voluntarily or involuntarily employed. Each respondent has at least two observations. The differences between voluntary and involuntary workers are all significant at a significance level of 1 percent.

<sup>(1)</sup> The question is not asked to self-employed respondents,  $N = 8,755$

<sup>(2)</sup> The question is not asked in the first observation period (2004-2005),  $N = 11,721$

<sup>(3)</sup> The question is not asked in the first observation period (2004-2005),  $N = 11,716$

<sup>(4)</sup> The work index is an index based on nine statements about the working conditions of one’s job (see table 2) for wording and coding of the nine statements). It ranges from 9 (low job quality) to 36 (high job quality).

**Table 2** : Nine statements about the working conditions of one's job.

Variables	Wording in SHARE
Not physically demanding *	<i>'My job is physically demanding, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Not under constant time pressure *	<i>'I am under constant time pressure due to a heavy workload, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Sufficient freedom in performing tasks *	<i>'I have very little freedom to decide how I do my work, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Opportunity for skills development	<i>'I have an opportunity to develop new skills, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Receive adequate support	<i>'I receive adequate support in difficult situations, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Receive recognition I deserve	<i>'I receive the recognition I deserve for my work, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Salary is adequate to my efforts	<i>'Considering all my efforts and achievements, my salary or earnings are adequate, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Sufficient job promotion prospects *	<i>'My job promotion prospects or prospects for job advancement are poor, would you say you strongly disagree, disagree, agree or strongly agree?'</i>
Sufficient job security *	<i>'My job security is poor, would you say you strongly disagree, disagree, agree or strongly agree?'</i>

**Note:** The response options range from 1 ('strongly disagree') to 4 ('strongly agree'). The statements with a star are recoded so that a higher score indicates better working conditions.

*you like to retire as early as you can from this job?'*. If the older worker answers in the affirmative, he or she is classified as involuntarily employed. The first part of the binary question ('*thinking about your present job*') approximates the decision '*to continue working*' in our definition of involuntary employment. The second part of the question ('*like to retire as early as you can*') represents the '*perception of being forced to work*'. We assume that when the older worker answers in the affirmative, retirement was the preferred option (instead of staying in his or her current situation) and the individual was restrained in his or her choice set.<sup>3</sup>

Across all countries, 47.25 percent of the employed respondents in our sample are involuntarily employed (weighted data). Table 1 gives an overview of personal characteristics of involuntary workers compared to voluntary workers. Involuntary workers are one year less educated and are less likely to be self-employed than voluntary workers. They are more frequently employed as blue collar workers and more often have a full-time and permanent occupation. Their job is more likely in the mining or construction sector, or in the sector of public administration and defense. They are less likely employed in real estate and education sector. Involuntary workers often have jobs with a lower job quality score. Their financial and health situation is worse than that of voluntary workers.

The explanatory variables in the regression are the working conditions, the physical and mental health situation, the financial situation and the current job situation of the partner. The working conditions are

<sup>3</sup> Changing jobs could be an alternative option but older workers do not frequently change jobs; only 1-2 percent of the older workers aged between 50 and 64 years change jobs (FOD Werkgelegenheid Arbeid en Sociaal Overleg, 2018; Neefs & Herremans, 2015).

defined by nine statements with four response options: from 1 (*‘strongly disagree’*) to 4 (*‘strongly agree’*). The statements are displayed in table 2. In this way, the working conditions of the senior worker’s job are described in terms of physical demands, time pressure in performing tasks, freedom in performing tasks, opportunity for skills development, support in difficult situations, recognition for work, job security, job promotion prospects and salary commensurate with effort. We recoded the statements indicated with a star so that a higher score always indicates better working conditions. The physical health situation of the worker is approximated by the self-perceived health question that rates health from 1 (*‘excellent’*) to 5 (*‘poor’*) and by a more objective measure that counts the number of limitations with daily activities that the respondent struggles to perform. The variable ranges from 0 (no limitations) to 23 (the individual struggles with all activities suggested). Examples are *‘walking 100 meters’* or *‘preparing a hot meal’*. The mental health is approximated by the Euro-D symptom scale. This scale is a simple index of twelve binary questions about depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness. The income situation of the worker is captured by the net household income, calculated in income percentiles and by a subjective measure that asks the respondent whether his or her household has the ability to make ends meet. This variable ranges from 1 (*‘with great difficulty’*) to 4 (*‘easily’*). The final factor is the partner’s work status. This variable uses information from the work status question answered by the partner of the interviewee and distinguishes between having no partner, a partner who has passed away and a partner who is currently employed, retired or has another work status (for example, a homemaker, permanently sick or disabled, or unemployed).

As mentioned in the methodology section, we take into account the individual expectations about retirement. It refers to the older worker’s expectations about when he or she will retire. We use two measures: ‘fraction retired’ and ‘years to retirement’. The first variable (‘fraction retired’) captures the probability of being retired at a certain age, for a certain gender and country. The variable is the percentage of the SHARE respondents (for a certain age, gender and country) who are retired. The second measure (‘years to retirement’) is the difference in years between the current age of the respondent and the expected eligible age of retirement, using the following question: *‘At what age do you yourself expect to start collecting pension benefits for the first time?’*. We include the two measures together as well as separately in the estimations. The spearman correlation coefficient is -0.6490 ( $p = 0.000$ ). Both measures are influenced by the pension system in the worker’s country and will consequently influence the country effects in our estimations.

## Results

The first aim of this paper is the identification of the personal factors that influence the probability of being involuntarily employed. The estimations using Mundlak’s correction of the random effects logit regression are displayed in odds ratios (OR) in table 3. We interpret an estimate of 1.334 for the ‘not agree’- dummy of the statement about the level of physically demanding tasks in the job as follows: if the job is more physically demanding (the score goes from ‘agree’ to ‘not agree’), then the probability of being involuntarily employed is 1.33 times higher than for those whose job is not physically demanding.<sup>4</sup> An odds ratio greater than 1 reflects an increased probability of being involuntarily employed, an odds ratio

---

<sup>4</sup> The odds are based on a ratio calculation. It expresses the probability of being involuntarily employed divided by the probability of being voluntarily employed. The odds ratio (OR) is the ratio of two odds. The odds ratio (OR) expresses the odds for having a more physically demanding job (‘not agree’) divided by the odds for having not a physically demanding job (‘agree’).

**Table 3:** The effects of personal factors on the probability of being involuntarily employed in odds ratios.

	(1)	(2) Including the individual expectations to retire
<i>Working conditions</i>		
Not physically demanding (ref: agree)		
strongly not agree	1.559*** (0.20)	1.771*** (0.27)
not agree	1.334*** (0.12)	1.442*** (0.15)
strongly agree	0.979 (0.09)	0.997 (0.10)
Not under constant time pressure (ref: agree)		
strongly not agree	1.668*** (0.20)	1.657*** (0.22)
not agree	1.242*** (0.10)	1.249** (0.11)
strongly agree	1.036 (0.11)	0.983 (0.12)
Sufficient freedom in performing tasks (ref: agree)		
strongly not agree	1.175 (0.16)	1.306* (0.20)
not agree	1.289*** (0.11)	1.262** (0.13)
strongly agree	0.819*** (0.06)	0.866 (0.08)
Opportunity for skills development (ref: agree)		
strongly not agree	1.316* (0.19)	1.335* (0.23)
not agree	1.323*** (0.12)	1.377*** (0.14)
strongly agree	0.745*** (0.06)	0.782** (0.08)
Receive adequate support (ref: agree)		
strongly not agree	1.382** (0.21)	1.437** (0.25)
not agree	1.347*** (0.12)	1.313*** (0.13)
strongly agree	1.007 (0.09)	1.049 (0.10)
Receive recognition I deserve (ref: agree)		
strongly not agree	1.438** (0.22)	1.421** (0.25)
not agree	1.559*** (0.14)	1.498*** (0.15)
strongly agree	0.798** (0.073)	0.778** (0.08)
Salary is adequate to my efforts (ref: agree)		
strongly not agree	1.608*** (0.22)	1.595*** (0.25)
not agree	1.372*** (0.12)	1.313*** (0.13)
strongly agree	0.842* (0.09)	0.851 (0.10)
Sufficient job promotion prospects (ref: agree)		
strongly not agree	1.294** (0.14)	1.373** (0.17)
not agree	1.072 (0.08)	1.105 (0.10)
strongly agree	1.017 (0.11)	1.027 (0.13)
Sufficient job security (ref: agree)		
strongly not agree	1.069 (0.16)	1.058 (0.18)
not agree	1.204** (0.11)	1.162 (0.13)
strongly agree	1.080 (0.08)	1.079 (0.09)
<i>Physical health</i>		
Self-Perceived Health (ref: good)		
Excellent	0.934 (0.09)	0.916 (0.10)
very good	1.025 (0.07)	0.989 (0.08)
Fair	1.204** (0.11)	1.173 (0.13)
Poor	1.333 (0.31)	1.038 (0.28)
Number of daily limitations [0,23]	1.048* (0.03)	1.012 (0.03)
<i>Mental health</i>		
Euro-D symptom scale [0,12]	1.070*** (0.02)	1.072*** (0.03)
<i>Income</i>		
Ability to make ends meet (ref: fairly easy)		
with great difficulty	1.385** (0.23)	1.449* (0.29)
with some difficulty	1.147 (0.10)	1.261** (0.14)
easily	0.940 (0.06)	0.959 (0.07)
Net household income in percentiles	1.002 (0.02)	1.003 (0.02)

Continuation of table 3

	(1)	(2)
<i>Partner's work status</i>		
Partner is employed (ref)		
no partner	0.960 (0.17)	0.871 (0.18)
widow	1.021 (0.22)	1.105 (0.26)
partner is retired	1.376*** (0.14)	1.281** (0.14)
other job situation (unemployed, disabled,...)	1.095 (0.11)	1.036 (0.12)
<i>Expectations to retire</i>		
Fraction retired		1.120 (0.41)
Years to retirement		0.841*** (0.02)
<i>Demographic variables</i>		
Age (in years)	1.126*** (0.02)	0.865*** (0.03)
Gender (ref: male)	0.618*** (0.04)	0.575*** (0.04)
Years of education	0.948*** (0.008)	0.968*** (0.009)
Observations	18,104	14,104
Respondents	7,842	7,039

**Note:** The estimates are expressed in odds ratios. An odds ratio greater than 1 reflects an increased probability of being involuntarily employed, an odds ratio less than 1 signifies decreased odds. The individual effects and an interaction between the country dummies and the time effects are included in the estimations but not mentioned in table. Robust clustered standard errors in parentheses: \*\*\*  $p < 0.01$ , \*\*  $< 0.05$ , \*  $p < 0.1$

less than 1 signifies decreased odds. The first column of table 3 displays the estimations without the inclusion of the expectations to retire. We find that the working conditions of the older worker's job are significant determinants of involuntary employment. Older workers employed in jobs with good working conditions are more likely to continue working (prefer this option above retiring) than older workers with jobs scoring low on several working condition statements. Particularly, jobs that are physical demanding or difficult in time managing greatly influence chances of being involuntarily employed. Involuntary employment is also more likely if the work of the older worker is not appreciated by colleagues or by the management. An imbalance between salary and effort or insufficient recognition for one's work increases the probability of being involuntarily employed.

As for the other personal factors, we find that feeling more depressed, increases the perception of being involuntarily employed. The probability of being involuntarily employed is higher if the health situation is worse, if the financial situation is more difficult or when the partner retires before the older worker does. The estimations also contain demographic variables (age, gender and number of years of education), individual effects and an interaction between the country dummies and the time effects (country-specific time effects). The latter two are not displayed in table 3, but are discussed in the next section (cross-country differences, *infra*). Female workers and high-educated workers are less likely to be involuntarily employed.

In the second column of table 3, we include the two variables ('fraction retired' and 'years to retirement') about the individual expectations to retire in the regression. Workers are more likely to be involuntary employed if they are close to their expected moment of retirement. The variable 'fraction retired' is not significant, neither when included separately and nor when combined with the other variable ('years to retirement') in the regression. The variable is correlated with the age of the worker and the dummy of the partner being retired. The older the individual gets, the higher the fraction of peers retired and the higher the likelihood of the partner being retired. Including the expectations to retire, the more important the

financial situation is for the probability of being involuntarily employed. The working conditions are not influenced by the expectations to retire.

As the estimates are expressed in odds ratios, it is difficult to compare the size of the effects between different variables. In appendix A, we calculate the average partial effects (APE) of the estimates of table 3. An increasing level of physically demanding or time pressured tasks in the older worker's job, increases the probability of being involuntarily employed with three to seven percent-points. Similar APE are found for an increasing level of imbalance between salary and effort and for the recognition for one's work. If the partner retires, chances increase with four percent-points. The APE for the health and income variables are smaller.

## **Cross-country differences**

The second aim of this paper is to comprehend the considerable differences between countries. Table 4 displays the fraction of the older workers that are involuntarily employed for each country and the evolution of it over the period 2004-2013. The percentage of older workers involuntarily employed ranges from 29 percent in Switzerland to 62 percent in Spain. In addition, for Germany, the percentage increases over the period 2004-2013, while for Sweden and Denmark it decreases. Can cross-country differences in working conditions (or other observable personal factors of involuntary employment) explain this discrepancy? Or is there an explanation to be found in the different public policies, e.g. pension systems? In this section, we first discuss the country and time effects of our estimations (see table 3). Second, we investigate (descriptively) cross-country differences in the explanatory variables. Third, we describe four aspects of the pension system (the likelihood to retire before the official retirement age, the financial attractiveness and the likelihood of partial and joint retirement) and show the cross-country differences in these aspects.

In our estimations (table 3), we include an interaction between the country dummies and the time effects in order to capture country-specific time effects. Table 5 displays the country and time effects (first column) and an interaction between the country and time effects (second column). As there is a correlation between the age and time effects and between expectations to retire and country effects, expectations to retire and the age of the individual are excluded in the estimations to discuss the time and country effects. The estimates are expressed in odds ratios. The probability of being involuntarily employed is higher in 2013 compared to 2011 for most countries, independent from changes in the older worker's job, financial and health situation and the partner's work status. Many European countries have restricted early retirement possibilities and/or have raised the mandatory retirement age over that period (OECD, 2014). The situation in 2006-7 was for most countries equally to 2011. The situation in 2004-5 was 'worse' (higher chances of being involuntarily employed) than 2011 in Sweden, Switzerland and Denmark. In Spain there was a higher probability of involuntary employment in both 2004-5 and 2006-7 compared to 2011. Even when controlling for changes in the older worker's job, financial and health situation and the partner's work status, the probability of being involuntarily employed also differs greatly between countries. In comparison to Belgian older workers, Austrian, German, Spanish and French older workers have a higher probability of being involuntarily employed, while Swiss workers have a lower probability. Table 4 pointed to similar country differences: a higher share of involuntary workers in Austria, Germany, Spain and France and a lower share in Switzerland compared to Belgium. Both results together suggest that a higher number of involuntary workers (table 4) is to some extent linked to country differences (significant country effects in

**Table 4:** Share of the older workers who are involuntarily employed (SHARE, 2004-13).  $N = 19,923$  ~ weighted data

	Austria	Belgium	Denmark	France	Germany	Netherlands	Spain	Sweden	Switzerland
2004-5	51.23	32.58	41.81	50.87	40.95	26.61	61.52	38.91	25.08
2006-7	53.98	36.42	30.58	54.96	44.94	36.89	65.77	27.89	31.33
2011	44.42	30.05	27.12	57.17	45.70	31.39	54.54	26.49	27.91
2013	42.19	34.30	27.16	60.70	46.93	33.47	62.26	23.17	29.24
average	46.77	33.41	31.30	56.86	44.72	32.13	61.60	29.66	28.65
sample size	1,516	2,926	2,656	2,804	1,324	2,122	1,360	2,412	2,666

**Note:** The involuntary employment rate is the percentage of employed persons (aged 50-70 years) that are involuntarily employed. Weights are provided from SHARE. The sample size for each country is the number of (voluntary and involuntary) employed respondents aged 50 and above (with at least two observations) for that country.

table 5). Table 9 of appendix A shows the average partial effects (APE) for the country and time dummies of table 5. Based on the APE, we can calculate an alternative ranking of countries in the involuntary employment rates for which the effects of the individual's working conditions, health, income and the partner's work status are neutralized by keeping these variables constant. Switzerland is still ranked as first with the lowest rate of involuntary employment (9.8%). Germany (21.5%), Austria (22.6%), France (34.2%) and Spain (37.8%) are still ranked as the countries scoring the highest on involuntary employment. The following countries are ranked differently but the differences across countries are small: Switzerland is followed by Belgium (13%; 5<sup>th</sup> ranked according to the raw percentages in table 4), Sweden (16.1%; 2<sup>nd</sup>), Netherlands (16.9%; 4<sup>th</sup>) and Denmark (17%; 3<sup>rd</sup>). We try to disentangle some of the country-specific indicators that might drive the country effects in table 7 (see *infra*).

The cross-country differences in the percentage of involuntary workers in the labor population aged 50 and above are partly explained by the personal factors in our estimations. By including interactions between the country dummies and the explanatory variables, we estimate whether the effect of a change in the personal factors on the probability of being involuntarily employed differs between countries. Only a few of the interaction terms are significant.<sup>5</sup> Furthermore, in table 6 we consider individual composition effects, indicating that in a certain country where there are more workers with a characteristic that increases the probability of involuntary employment there will be a higher number of involuntary workers. The countries are ordered according to the share of involuntary workers in the working population (from lowest to highest, see table 4). For each explanatory variable, the two '*most favorable*' scores for countries in terms of voluntary employment are double-underlined and the two '*poorest*' situations single-underlined. For example, involuntary workers are more often employed in jobs lacking recognition for one's work (see table 3). Sweden and Denmark have the highest score on the statement about the level of recognition (see table 6). The average job situation in these countries are the most favorable as it has a lower chance of involuntary employment. We conclude from table 6 that the most favorable situations are frequently in the countries scoring the lowest rates of involuntary employment (Switzerland, Sweden and Denmark), specifically for the working conditions (except the level of time pressure tasks) and the financial situation. Austria, France

<sup>5</sup> The estimations including the interactions are available on request.

**Table 5:** The country and time effects on the probability of being involuntarily employed, in odds ratios

	(1) Country and time effects	(2) Interaction between country and time effects
<i>Country specific time effects</i>		
Time: 2011 (ref)		
2004-2005	1.140* (0.09)	0.682** (0.13)
2006-2007	1.104 (0.07)	1.064 (0.19)
2013	1.169*** (0.06)	1.488*** (0.20)
Country: Belgium (ref)		
Austria	2.038*** (0.28)	2.331*** (0.43)
Germany	1.888*** (0.28)	2.345*** (0.54)
Sweden	1.271* (0.16)	1.152 (0.24)
Netherlands	1.350** (0.17)	1.418* (0.27)
Spain	5.930*** (0.88)	4.683*** (0.97)
France	4.608*** (0.55)	5.181*** (0.87)
Denmark	1.356** (0.17)	1.179 (0.21)
Switzerland	0.773** (0.10)	0.685** (0.12)
Country x time		
2004-5 x Austria		1.489 (0.54)
2004-5 x Germany		1.175 (0.38)
2004-5 x Sweden		3.008*** (0.83)
2004-5 x Netherlands		0.768 (0.22)
2004-5 x Spain		1.858* (0.63)
2004-5 x France		1.029 (0.29)
2004-5 x Denmark		4.092*** (1.13)
2004-5 x Switzerland		2.177** (0.69)
2006-7 x Austria		1.049 (0.38)
2006-7 x Germany		0.788 (0.22)
2006-7 x Sweden		0.841 (0.22)
2006-7 x Netherlands		1.201 (0.30)
2006-7 x Spain		1.767* (0.55)
2006-7 x France		0.695 (0.17)
2006-7 x Denmark		1.227 (0.29)
2006-7 x Switzerland		1.534 (0.40)
2013 x Austria		0.553*** (0.12)
2013 x Germany		0.641 (0.18)
2013 x Sweden		0.578** (0.15)
2013 x Netherlands		0.888 (0.20)
2013 x Spain		1.141 (0.28)
2013 x France		0.893 (0.17)
2013 x Denmark		0.652** (0.13)
2013 x Switzerland		0.787 (0.15)
Individual effects (average)	0.130*** (0.08)	0.135*** (0.08)
Observations	18,104	18,104
Individuals	7,842	7,842

Note: The estimates are expressed in odds ratios. An odds ratio greater than 1 reflects an increased probability of being involuntarily employed, an odds ratio less than 1 signifies a decreased probability. The variables working conditions, health, income, partner's work status, gender and years of education as in table 3 are included in the estimations (but not mentioned in the table). Robust clustered standard errors in parentheses: \*\*\* p<0.01, \*\* <0.05, \* p<0.1

**Table 6:** Cross-country differences in the explanatory variables.  $N = 19,923$  ~ weighted data

	Switzerland	Sweden	Denmark	Netherlands	Belgium	Germany	Austria	France	Spain
The average working conditions of involuntary workers: <i>The statements range from 1 ('poor' job quality) to 4 ('excellent' job conditions).</i>									
Physical demanding	<u>2.62</u>	<u>2.63</u>	2.52	2.50	2.45	<u>2.44</u>	<u>2.36</u>	2.55	2.55
Time pressure	2.25	2.41	2.23	<u>2.54</u>	2.23	<u>2.15</u>	<u>2.21</u>	<u>2.49</u>	2.41
Recognition of support	2.82	<u>2.92</u>	<u>2.84</u>	2.72	<u>2.54</u>	2.80	2.62	<u>2.44</u>	2.77
Balance efforts and salary	<u>2.88</u>	2.37	<u>2.63</u>	2.62	2.55	2.44	2.52	<u>2.36</u>	<u>2.28</u>
The average mental health status of involuntary workers: <i>The Euro-D consist of twelve binary items, the higher the scale the higher the level of depression.</i>									
Average Euro-D scale	2.09	<u>1.76</u>	1.91	1.89	<u>2.39</u>	2.11	<u>1.48</u>	<u>2.44</u>	1.77
The average financial situation of involuntary workers: <i>The ability to make ends meet ranges from 1 ('with great difficulty') to 4 ('easily').</i>									
Average ability to make ends meet	<u>3.41</u>	3.37	<u>3.54</u>	3.32	3.16	2.96	3.15	<u>2.88</u>	<u>2.76</u>
The percentage of partners of involuntary workers who are retired <i>The denominator consists of the involuntary workers with an interviewed partner. In percentages.</i>									
Partner retired	<u>8.38</u>	17.96	10.41	<u>7.30</u>	14.28	14.18	<u>25.48</u>	<u>18.70</u>	10.17

**Note:** The countries are ordered according to the share of involuntary workers in the working population (from lowest to highest, see table 4). For each explanatory variable, the two 'most favorable' scores for countries in terms of voluntary employment are double-underlined and the two 'poorest' situations single-underlined. SHARE provides weights based on region, age group and sex, separately for each country and observation period (Abduladze et al., 2013). The differences between the countries are significant (one-way ANOVA,  $p < 0.01$ ).

and Spain have the highest percentages of workers being involuntarily employed. These countries also score lower on the ability to make ends meet and on the balance between efforts and salary. These countries also have the highest percentage of partners retired.

The country effects in our estimations are significant (see table 5), indicating that the probability of being involuntarily employed is partly explained by time-invariant factors that differ across countries, for example public policies, e.g. pension systems. In table 7, we try to disentangle some of the country specificities that might drive the results. We consider four aspects of the pension system; the likelihood to retire before the official retirement age, the financial attractiveness and the likelihood of partial and joint retirement.

First, the official retirement age for men is in most countries 65 years. Many countries allow for early retirement under certain conditions (such as a minimum age and minimum number of working years) and with a lower pension benefit withdrawal (OECD, 2016b). In the last years many European countries have changed the conditions to draw (early) pension benefits (OECD, 2017). This can influence involuntary employment as it constrains the choice set when the option to retire with pension benefits is not available.

Table 7 gives an overview of the early and normal retirement age (situation for retiring in 2016) and of the average age of leaving the labor market (situation in 2014 and 2016). In Belgium and France, older workers are leaving the labor market at the age of 60, in Switzerland and Sweden, they leave the labor market at the age of 65. The two variables approximating the individual expectations to retire ('fraction retired' and 'years to retirement') give us a glance at cross-country differences in the likelihood to retire at age 60 and 65. At age 60, countries with high rates of involuntary employment (at the right hand side of the table) such as Austria and France have higher percentages of the population retired. We can draw the same conclusions for men aged 65 years. The Netherlands and Spain have low percentages of the female population retired at age 60 or 65. This can be explained by the higher percentage of women that report themselves as homemaker in the survey. Table 7 also displays the average number of years (at the age of 55) until the older workers expect to be eligible to draw pension benefits. For this variable, an overall conclusion is more difficult. Sweden (ranked 2<sup>nd</sup> according to the lowest rates of involuntary employment, see table 4), the Netherlands (4<sup>th</sup>) and Germany (6<sup>th</sup>) have the highest number of years until retirement for both females and males. In Austria (7<sup>th</sup>), females aged 55 expect to retire within four years on average, while men expect to retire at 64.

Second, the older worker takes into consideration the financial attractiveness of the pension system when he or she decides to continue working or to retire. If the pension benefits could not assure a certain standard of living, the option to retire can be viewed as less desirable. This can be a reason to feel obligated to continue working. Due to the complexity of the pension systems, constructing comparative indicators is difficult and is based on a limited set of pension regulations that are assumed to apply to the total population of working age (e.g. Peeters, Verschraegen, & Debels, 2014). Consequently, ranking the countries according to these indicators may be misleading. Table 7 shows us the net replacement rates for each country. This indicator reflects the disposable income in retirement in comparison when working (OECD, 2017). In most countries the replacement rate is higher for the low income earners (less than average wage (AW)) in order to protect them from old-age poverty. The net ratio is usually higher than the gross ratio as the social contributions and taxes on pension benefits are lower than on labor earnings. The net ratio in the table contains the net benefits of mandatory and private schemes as many countries have invested in voluntary private pension schemes (OECD, 2017). The numbers do not give us a clear picture. The Netherlands (ranked 4<sup>th</sup> according to the lowest rates of involuntary employment), Austria (7<sup>th</sup>) and Denmark (3<sup>rd</sup>) have higher net replacement rates. The option to retire is financially more attractive in these countries. Switzerland (1<sup>st</sup>), Sweden (2<sup>nd</sup>) and Germany (6<sup>th</sup>) have the lowest net replacement rates.

The third factor that we consider is the likelihood of partial retirement. Partial retirement is "a situation when an individual is allowed to retire and receive retirement benefits while continuing to work (usually part-time) and contributing towards the retirement scheme" (OECD, 2005, p. 49). It is often viewed as a gradual transition from full-time employment to full retirement (OECD, 2017). Partial retirement is an additional option in the older worker's choice set in the decision to continue working or to retire. A larger choice set leads (in most cases) to a higher degree of voluntariness in the decision to keep on working (Botti, 2004). Almost two-thirds of the EU citizens would prefer a retirement scheme where they can combine work and partial retirement above a full-time retirement scheme (Eurofound, 2016). Table 7 shows that partial retirement for individuals aged 55-69 years is in general very rare. Partial retirement is highest in Sweden: 17.19 percent of the Swedish (2<sup>nd</sup>) older people received pensions while working in 2012. In Belgium (5<sup>th</sup>) only 1.75 percent and in Spain 0.50 percent (9<sup>th</sup>) are in the situation of partial retirement. The

**Table 7:** Pension indicators

	Switzerland	Sweden	Denmark	Netherlands	Belgium	Germany	Austria	France	Spain
<b>Earliest and normal retirement age</b>									
<i>The statistics show the age requirements for men with a full career retiring in 2016. The normal retirement age is the earliest age to be eligible for all pension components without deduction.</i>									
Earliest	63	61	60	n.a.	60	63	61.5	n.a.	61
Normal	65	65	65	65	65	65	65	60	65
<b>Average effective age of labor market exit for men</b>									
2014	66.3	65.2	63.0	62.9	60.0	62.7	62.2	59.4	62.2
2016	66.0	65.8	63.7	63.5	61.3	63.3	62.0	60.0	62.2
<b>The percentage of female or male respondents retired at age 60 or 65</b>									
<i>The variable 'fraction retired' (SHARE, 2004-13)</i>									
Females retired at 60	11.84	11.39	26.63	9.25	35.84	21.90	77.5	46.96	7.05
Males retired at 60	14.48	14.57	18.97	23.11	54.08	47.79	58.06	65.83	21.46
Females retired at 65	77.42	87.0	84.41	64.32	76.36	85.96	80.61	89.67	40.0
Males retired at 65	77.54	78.22	76.13	88.89	93.56	88.53	95.58	94.03	90.82
<b>Average number of years until older worker expect to be eligible to draw pension benefits</b>									
<i>The variable 'years to retirement' (SHARE, 2004-13)</i>									
Females at age 55	6.86	9.87	7.64	10.01	7.53	8.61	3.99	6.09	7.28
Males at age 55	8.47	11.00	8.45	10.66	7.38	8.43	9.41	7.34	10.0
<b>Net pension replacement rate</b>									
<i>The net pension benefits from mandatory (public and private) and voluntary (private) pension schemes as a percentage of the net individual earnings, AW = average wage</i>									
0.5 of AW:	57.4	62.4	110.3	105.1	81.3	66.5	92.2	70.4	79.3
1 of AW:	44.9	54.9	80.2	100.6	72.7	65.4	91.8	74.5	81.8
1.5 of AW:	31.5	67.6	76.2	100.2	60.5	64.6	90.9	70.3	81.7
<b>Combining work and pension benefits</b>									
<i>The percentage of population aged 55 to 69 years combining work and pension benefits</i>									
2012	9.44	17.19	5.33	3.95	1.75	/	5.70	4.08	0.50
<b>Joint retirement</b>									
<i>Fraction of couples that have retired within two years of each other, both partners are interviewed (SHARE)</i>									
2004-13	25.66	31.59	33.06	17.32	18.81	24.12	23.17	24.59	7.94

**Note:** The countries are ranked according to the percentage of older workers being involuntarily employed (from the lowest to the highest, see table 4). SHARE provides weights based on region, age group and sex, separately for each country and observation period (Abduladze et al., 2013).

Data extracted on 24/04/2018 from OECD (2015). *Pension at a Glance 2015: OECD and G20 indicators*. Paris: OECD publishing. and OECD. (2017) *Pension at a Glance 2017: OECD and G20 indicators*. Paris: OECD publishing.

countries with the lowest rates of involuntary employment are those with the highest rates of partial retirement (Sweden and Switzerland).

The fourth and last aspect of the pension systems that we consider, is the likelihood of joint retirement. Joint retirement is the situation in which the respondent and his or her partner (decide to) retire simultaneously. The partner of involuntary workers is more likely to be retired than employed (see table 3). As mentioned in the introduction, the decision to retire is frequently made at the household level instead of at the individual level (e.g. Coile, 2004; Gustafson, 2017; Gustman & Steinmeier, 2004). Partners like to retire simultaneously (e.g. Henkens, 1999). The partners are also interviewed in SHARE. We can link the interviews of both partners. Using the years of retirement of both respondents, we can determine if the partners are retired within two years of each other or not. Using SHARE, table 7 displays the share of retirees for which the partner is retired in the same year or within two years. One third of the Danish (3<sup>rd</sup>) couples retires jointly while in Spain (9<sup>th</sup>) this is the case in only 7.94 percent. We can see that countries with the lowest rates of involuntary employment have higher rates of joint retirement among older couples (especially Sweden and Denmark).

## **Conclusion**

This paper investigates the degree of voluntariness of the older worker's decision to continue working or to retire. As governments are supporting policies that delay the decision to retire, employment rates of people aged 50 and above are increasing (OECD, 2015, 2016a). It is important to investigate how older workers perceive their decision to continue working, as voluntarily or as forced. Involuntary workers have a lower level of overall well-being than voluntary workers (Sohier, 2018). If we want to include well-being considerations in the debate about longer working careers, we need to understand why a significant group of workers perceive their employment as an involuntary situation. Four out of ten senior employees in Europe perceive their employment decision as involuntary (Sohier, 2018). The discrepancy between countries is large. This paper examines the influence of the job, financial and health situation and of the partner's job situation on the probability of being involuntarily employed. We also investigate cross-country differences in the percentage of the older workers that are involuntarily employed.

Using Mundlak's correction of the random effects logit estimator, the working conditions of the respondent and the retirement situation of his or her partner are identified as important personal factors. The perception of being forced to continue working is affected by the working conditions of the senior worker's job. Specifically jobs with high time pressure or jobs that are physically demanding are associated with involuntary employment. Appreciation of colleagues or managers for the work done also determines involuntary employment. An insufficient recognition or being paid inadequately for the efforts of the senior worker enhances the perception of being forced to continue working. In this way, the study underlines the OECD recommendations for more qualitative or 'better' jobs (OECD, 2016a). Furthermore, age discrimination at the workplace is still a major issue and is for many older workers a barrier to continue working (Chiu, Chan, Snape, & Redman, 2001; Davey, 2018; Henkens, 2005). Examples of age discrimination are the lower participation rates of older workers in vocational education and training and the lower amount of training offers received (Taylor & Urwin, 2001). Older workers also take less part in development appraisals (Brooke, 2003). They experience reduced opportunities for promotions and less wage increase (Nelson, 2004). Longer working careers could further increase the age gap between older workers and the management and colleagues, and consequently increase age discrimination at the workplace. The older worker needs to feel appreciated for his or her work or perceives his decision to continue working more likely as involuntary.

The retirement of the partner is another determinant of involuntary employment. The chances of being involuntarily employed are higher if the partner retires. Spouses like to retire simultaneously (e.g. Henkens, 1999; Smith & Moen, 1998; Van Solinge & Henkens, 2007) and the decision to retire is frequently made at the household level rather than at the individual level (e.g. Coile, 2004; Gustafson, 2017; Gustman & Steinmeier, 2004). Policy should perhaps reconsider the conditions to retire on household level so that partners can retire simultaneously. For example, in a pension system with points<sup>6</sup>, partners could combine and exchange (individual) pension points in order to jointly satisfy their individual retirement conditions. For example, the oldest of the couple could ‘donate’ the amount of points that is equivalent to one extra year of employment to the youngest in order to be both eligible for (early) retirement benefits at the same moment. The idea is simple, the implementation is perhaps less straightforward as the composition of the household can change over the years and the age difference between the partners can be too large. The regulation should not be compulsory but it can facilitate joint retirement for some couples. The regulation could encourage as well as discourage older workers to continue working (voluntarily).

SHARE gives us the opportunity to investigate the differences in the involuntary employment rate between European countries. The percentage of older workers being involuntarily employed ranges from 29 percent (Switzerland) to 62 percent (Spain). First, we investigate how the (observed) personal factors of involuntary employment explain cross-country differences. Only a few of the interactions between the factors and the country dummies are significant, indicating that the effect of the personal factors on the probability of being involuntarily employed is not very different across countries. Furthermore, we investigate the cross-country differences in the composition of the explanatory variables. If, in a certain country, there are more workers with a characteristic that increases the probability of involuntary employment, there will be a higher number of involuntary workers in that country. We find that in the countries scoring the lowest on involuntary employment (Switzerland, Sweden and Denmark), the involuntary workers have the most favorable situations in terms of working conditions (except for the level of time pressure of tasks) and in terms of the ability to make ends meet as household. An avenue for future research is to perform a Blinder – Oaxaca decomposition (e.g. Fairlie (2005) and Nielsen (1998) for logit model) to further disentangle the cross-country differences in the probability of being involuntarily employed. Such a decomposition would split the differences in the percentage of involuntary employment between two countries into a part due to differences in the composition of the explanatory variables (endowment effect) and a part due to differences in the effects of these variables (slope effect). The decomposition would explain the difference between every pair of countries (for our sample of nine countries this means 36 pairwise comparisons). This goes beyond the scope of our research as presented here. However in more general terms, our results point to a bigger role for the endowments effects (as we noticed differences in the working conditions between the countries) than for the slope effects (as there are only a few significant interactions between the working conditions and the countries).

Second, the country dummies in our estimations are significant, indicating that the probability of being involuntarily employed is partly explained by time-invariant factors that differ across countries, for example

---

<sup>6</sup> An example is the points system that has been proposed by the Belgian Commission for Pension Reform 2020-2040 (Academische Raad van Pensioenen, 2017). In this system, each working year is equal to one point. Workers with a higher income than average or with a physically demanding job are receiving more than one point. At the end of the working career, the points are accumulated and multiplied by the value of the point and by a conversion coefficient.

public policies, e.g. pension systems. We investigate cross-country differences in four aspects of the pension system. We find that the countries with the lowest rates of involuntary employment have the highest rates of partial (i.e. combining labor income with pension benefits) and joint retirement (partners retiring within two years from each other). We did not find a link between the financial attractiveness of the pension system or the likelihood to retire before the official retirement age and the ranking of the country's rate of involuntary employment. Also the time effects are significant, indicating different time trends in the probability of being involuntarily employed. The probability of being involuntarily employed was higher in 2013 than in 2011. Over that period, many European countries have reformed the early retirement possibilities or have raised the official retirement age (OECD, 2014). The situation in 2006-7 was, for most countries, equal to the situation in 2011. The probability of being involuntarily employed was higher in 2004-5 (in comparison to the situation in 2011) in Sweden, Switzerland and Denmark, and lower in Spain.

The paper has some limitations. First, we have used Mundlak's correction of the random effects logit estimation approach as estimation technique. We can make causal interpretations if we can maintain the strict assumption of exogeneity of the explanatory variables. In reality, however, a mutual endogenous relationship between working conditions and the degree of involuntary employment is possible, and could lead to biased estimates. For example, as the job situation is self-reported, it is not unlikely that moving into involuntary employment, for whatever reason, makes individuals more negative in the assessment of their working conditions. Our estimation technique assumes that there are no feedback effects of the dependent variable on the explanatory variables. A possible way to address this is to include lagged values of the dependent variable (for example the lagged first-difference model described in Allison (2009)). A second source of endogeneity may be due to unobserved factors (both time-variant and constant) that affect both one or more of the explanatory variables and the individual's answer to the question of being involuntarily employed. The influence of individual characteristics (unobserved time-invariant individual effects) is taken into account by our estimation technique. The impact of time-varying 'shocks' is not, however. Characteristics of the pension system are frequently only individual-specific (in Belgium, the pension regulations can differ between employees, civil servants and self-employed persons) but can change over time by reforms. For example, due to higher age requirements for withdrawal of the (early) retirement benefits, the older worker has to work longer and can perceive his decision to continue working as less voluntary. Simultaneously, the older worker can feel less appreciated at work by the management or colleagues. An appropriate procedure to deal with this problem would be a control function approach (e.g. Wooldridge, 2015). This allows endogenous regressors, but the estimation technique requires finding reliable instruments. Second, the SHARE question (*'Thinking about your present job, would you like to retire as early as you can from this job?'*, two answering options: 'yes' and 'no') is only one (specific) way to operationalize involuntary employment. We wanted to use SHARE as a detailed and longitudinal micro data sample for our estimations and this was the question that is available in SHARE to approximate involuntary employment. The following question (*'To what degree is the decision to continue working your own choice?'*, four answering options: 'completely not my own choice', 'rather not my own choice', 'rather my own choice' and 'completely my own choice'.) would be an alternative that could yield different results. The formulation of this alternative question is more straightforward than the SHARE question in asking the individual about the degree of voluntariness in the decision to continue working. The respondent has four response options instead of two, allowing the respondent to report about some degree in the voluntariness of the decision (partly forced, partly voluntarily).

**Funding information** This paper uses data from Survey of Health, Ageing and Retirement in Europe (SHARE) Waves 1, 2, 4 and 5 (DOIs: 10.6103/SHARE.w1.611, <https://doi.org/10.6103/SHARE.w2.260>, <https://doi.org/10.6103/SHARE.w4.111>, <https://doi.org/10.6103/SHARE.w5.100>). The SHARE data collection has been primarily funded by the European Commission through the FP5 (QLK6-CT-2001-00360), FP6 (SHARE- I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982). Additional funding from the U.S. National Institute on Aging (U01\_AG09740-13S2, P01\_AG005842, P01\_AG08291, P30\_AG12815, R21\_AG025169, Y1-AG-4553-01, IAG\_BSR06-11, OGHA\_04-064), the German Ministry of Education and Research and from various national funding sources is gratefully acknowledged (see [www.share-project.org](http://www.share-project.org)). This research is supported by the Special Research Fund of Ghent University and the National Bank of Belgium.

## **Appendix A: Average partial effects**

Table 8 and 9 show the estimations of table 3 and 5 expressed in average partial effects. We interpret an estimate of 0.037 for the ‘not agree’- dummy of the working conditions statement about the level of physically demanding tasks in the job as follows: if the job is more physically demanding (the score goes from agree to not agree), then the probability of being involuntarily employed increases with 3,7 percent-points.

Table 8: The effects of personal factors on the probability of being involuntarily employed, in average partial effects

	(1)	(2) Including the individual expectations to retire
<i>Working conditions</i>		
Not physically demanding (ref: agree)		
strongly not agree	0.058***	0.074***
not agree	0.037***	0.047***
strongly agree	-0.003	-0.004
Not under constant time pressure (ref: agree)		
strongly not agree	0.067***	0.066***
not agree	0.028***	0.028**
strongly agree	0.005	-0.002
Sufficient freedom in performing tasks (ref: agree)		
strongly not agree	0.021	0.035*
not agree	0.033***	0.030**
strongly agree	-0.026***	-0.018
Opportunity for skills development (ref: agree)		
strongly not agree	0.036*	0.038*
not agree	0.037***	0.042***
strongly agree	-0.038***	-0.031**
Receive adequate support (ref: agree)		
strongly not agree	0.042**	0.047**
not agree	0.039***	0.035***
strongly agree	0.0008	0.006
Receive recognition I deserve (ref: agree)		
strongly not agree	0.048**	0.046**
not agree	0.059***	0.053***
strongly agree	-0.029**	-0.032**
Salary is adequate to my efforts (ref: agree)		
strongly not agree	0.063***	0.061***
not agree	0.041***	0.035***
strongly agree	-0.022*	-0.020
Sufficient job promotion prospects (ref: agree)		
strongly not agree	0.033**	0.041**
not agree	0.009	0.013
strongly agree	0.002	0.003
Sufficient job security (ref: agree)		
strongly not agree	0.009	0.007
not agree	0.024**	0.019
strongly agree	0.010	0.010
<i>Physical health</i>		
Self-Perceived Health (ref: good)		
Excellent	-0.009	-0.011
very good	0.003	-0.001
Fair	0.024**	0.021
Poor	0.038	0.005
Number of daily limitations [0,23]	0.006*	0.002
<i>Mental health</i>		
Euro-D symptom scale [0,12]	0.009***	0.009***
<i>Income</i>		
Ability to make ends meet (ref: fairly easy)		
with great difficulty	0.043**	0.048*
with some difficulty	0.018	0.030**
easily	-0.008	-0.005
Net household income in percentiles	0.0003	0.0004

Continuation of table 8

	(1)	(2)
<i>Partner's work status</i>		
Partner is employed (ref)		
no partner	-0.005	-0.018
widow	0.003	0.013
partner is retired	0.042***	0.032**
other job situation (unemployed, disabled,...)	0.012	0.005
<i>Expectations to retire</i>		
Fraction retired		0.015
Years to retirement		-0.022
<i>Demographic variables</i>		
Age (in years)	0.015***	-0.019***
Gender (ref: male)	-0.062***	-0.071***
Years of education	-0.007***	-0.004***
Observations	18,104	14,104
Respondents	7,842	7,039

**Note:** The estimates are expressed in the average partial effects (APE). The APE equals the percent-point increase or decrease in the probability of being involuntary employed. The individual effects and an interaction between the country dummies and the time effects are included in the estimations but not mentioned in table. \*\*\* p<0.01, \*\* <0.05, \* p<0.1

**Table 9:** The country and time effects on the probability of being involuntarily employed, in average partial effects

	(1)
	Country and time effects
<i>Country and time effects</i>	
Time: 2011 (ref)	0.017*
2004-2005	0.013
2006-2007	0.021***
2013	
Country: Belgium (ref)	
Austria	0.096***
Germany	0.085***
Sweden	0.031*
Netherlands	0.039**
Spain	0.248***
France	0.212***
Denmark	0.040***
Switzerland	-0.032**
Individual effects (average)	0.130***
Observations	18,104
Individuals	7,842

**Note:** The estimates are expressed in the average partial effects (APE). The APE equals the percent-point increase or decrease in the probability of being involuntary employed. The variables working conditions, health, income, partner's work status, gender and years of education as in table 3 are included in the estimations (but not mentioned in the table). \*\*\* p<0.01, \*\* <0.05, \* p<0.1

## References

- Abduladze, L., Malter, F., & Börsch-Supan, A. (2013). *SHARE Wave 4: Innovations & Methodology*: Munich center for the economics of aging.
- Academische Raad van Pensioenen. (2017). Pension met punten uitgelegd. Retrieved 07/04/2018, from <http://www.academischeraadpensioenen.be/docs/nl/20171026%20-%20De%20verdeling%20per%20punten.pdf> (07/04/2018)
- Allison, P. D. (2009). *Fixed effects regression models* (Vol. 160): SAGE publications.
- Bavetta, S., & Navarra, P. (2012). *The Economics of Freedom: Theory, Measurement, and Policy Implications*: Cambridge University Press.
- Börsch-Supan, A., & Alcsér, K. H. (2005). *Health, ageing and retirement in Europe: first results from the Survey of Health, Ageing and Retirement in Europe*: Mannheim Research Institute for the Economics of Aging (MEA) Mannheim.
- Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., . . . Zuber, S. (2013). Data resource profile: the Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology*, 42(4), 992-1001.
- Botti, S. (2004). The psychological pleasure and pain of choosing: when people prefer choosing at the cost of subsequent outcome satisfaction. *Journal of personality and social psychology*, 87(3), 312-326.
- Brooke, L. (2003). Human resource costs and benefits of maintaining a mature-age workforce. *International journal of manpower*, 24(3), 260-283.
- Chamberlain, G. (1980). Analysis of Covariance with Qualitative Data. *Review of Economic Studies*, 47(1), 225-238.
- Chiu, W. C. K., Chan, A. W., Snape, E., & Redman, T. (2001). Age stereotypes and discriminatory attitudes towards older workers: An East-West comparison. *Human relations*, 54(5), 629-661.
- Coile, C. (2004). Retirement incentives and couples' retirement decisions. *Topics in Economic Analysis and Policy*, 4(1), art 17. 11-24.
- Davey, J. (2018). Age discrimination in the workplace. *Policy Quarterly*, 10(3), 42-48.
- Desmette, D., & Gaillard, M. (2008). When a "worker" becomes an "older worker" The effects of age-related social identity on attitudes towards retirement and work. *Career Development International*, 13(2), 168-185.
- Eurofound. (2016). *Extending Working Lives Through Flexible Retirement Schemes: Partial Retirement*. Luxembourg: Publications Office of the European Union.
- Fairlie, R. W. (2005). An extension of the Blinder-Oaxaca decomposition technique to logit and probit models. *Journal of economic social measurement*, 30(4), 305-316.
- FOD Werkgelegenheid Arbeid en Sociaal Overleg. (2018). Arbeidsmarkt schuifelt richting langere loopbaan. from <http://www.werk.belgie.be/defaultNews.aspx?id=47919> (26/11/2018)
- Greene, W. H. (2004). Fixed effects and bias due to the incidental parameters problem in the Tobit model. *Econometric reviews*, 23(2), 125-147.
- Greene, W. H. (2012). *Econometric Analysis (7th)*: Prentice Hall, Upper Saddle River, New Jersey.
- Gustafson, P. (2017). Spousal age differences and synchronised retirement. *Ageing & Society*, 37(4), 777-803.
- Gustman, A. L., & Steinmeier, T. L. (2004). Social security, pensions and retirement behaviour within the family. *Journal of Applied Econometrics*, 19(6), 723-737.
- Henkens, K. (1999). Retirement intentions and spousal support: A multi-actor approach. *The journal of Gerontology Series B: Psychological Sciences and Social Sciences*, 54(2), S63-S73.
- Henkens, K. (2005). Stereotyping older workers and retirement: The managers' point of view. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, 24(4), 353-366.
- Herzberg, F., Mausner, B., & Snyderman, B. B. (2011). *The Motivation to Work*: Transaction Publishers.
- Herzog, A., House, J. S., & Morgan, J. N. (1991). Relation of work and retirement to health and well-being in older age. *Psychology and aging*, 6(2), 202-211.
- Isaksson, K., & Johansson, G. (2000). Adaptation to continued work and early retirement following downsizing: Long-term effects and gender differences. *Journal of Occupational and Organizational Psychology*, 73(2), 241-256.
- Malter, F., & Börsch-Supan, A. (2015). *SHARE Wave 5: Innovations & Methodology*. Munich: MEA, Max Planck Institute for Social Law and Social Policy.
- Mundlak, Y. (1978). On the pooling of time series and cross section data. *Econometrica*, 56, 69-85.

- Neefs, B., & Herremans, W. (2015). Een baan voor het leven? Over jobanciënniteit en arbeidsmobiliteit op de Vlaamse arbeidsmarkt. *Over.Werk*, 2, 136-145.
- Nelson, T. D. (2004). *Ageism: Stereotyping and prejudice against older persons*. Cambridge: MIT press.
- Nielsen, H.S. (1998), Discrimination and Detailed Decomposition in a Logit Model, *Economics Letters*, 61(1), pp. 115-20.
- Nilsson, K., Hydbom, A. R., & Rylander, L. (2011). Factors influencing the decision to extend working life or retire. *Scandinavian journal of work, environment & health*, 37(6), 473-480.
- OECD. (2005). *Private Pensions: OECD Classification and Glossary*. Paris: OECD Publishing.
- OECD. (2014). *OECD Pensions Outlook 2014* Paris: OECD publishing.
- OECD. (2015). *Pensions at a Glance 2015: OECD and G20 Indicators*. Paris: OECD publishing.
- OECD. (2016a). *OECD Employment Outlook 2016*. Paris: OECD publishing.
- OECD. (2016b). *OECD Pensions Outlook 2016*. Paris: OECD publishing.
- OECD. (2017). *Pensions at a Glance 2017: OECD and G20 Indicators*. Paris: OECD Publishing.
- Peeters, H., Verschraegen, G., & Debels, A. (2014). Commensuration and policy comparison: How the use of standardized indicators affects the rankings of pension systems. *Journal of European Social Policy*, 24(1), 19-38.
- Schalk, R., & Desmette, D. (2015). Intentions to continue working and its predictors *Aging workers and the employee-employer relationship* (pp. 187-201): Springer.
- Sen, A., Muellbauer, J., Kanbur, R., Hart, K., & Williams, B. (1987). *The standard of living*: Cambridge: Cambridge University Press.
- Shacklock, K., & Brunetto, Y. (2011). A model of older workers' intentions to continue working. *Personnel Review*, 40(2), 252-274.
- Shacklock, K., Brunetto, Y., & Nelson, S. (2009). The different variables that affect older males' and females' intentions to continue working. *Asia Pacific Journal of Human Resources*, 47(1), 79-101.
- Smith, D. B., & Moen, P. (1998). Spousal influence on retirement: His, her, and their perceptions. *Journal of Marriage and the Family*, 60(3), 734-744.
- Sohier, L. (2018). Do Involuntary Longer Working Careers Reduce Well-being? *Applied Research in Quality of Life*. doi: 10.1007/s11482-017-9586-8
- Szinovacz, M. E., & Davey, A. (2005). Predictors of perceptions of involuntary retirement. *The Gerontologist*, 45(1), 36-47.
- Taylor, P., & Urwin, P. (2001). Age and participation in vocational education and training. *Work, employment and society*, 15(4), 763-779.
- Van Dam, K., Van der Vorst, J. D., & Van der Heijden, B. I. (2009). Employees' Intentions to Retire Early A Case of Planned Behavior and Anticipated Work Conditions. *Journal of Career Development*, 35(3), 265-289.
- Van Solinge, H., & Henkens, K. (2007). Involuntary retirement: The role of restrictive circumstances, timing, and social embeddedness. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 62(5), 295-303.
- Wang, M., & Shultz, K. S. (2010). Employee retirement: A review and recommendations for future investigation. *Journal of Management*, 36(1), 172-206.
- Wooldridge, J. M. (2015). Control function methods in applied econometrics. *Journal of Human Resources*, 50(2), 420-445.