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ARTICLE

Assessing the impact of partial early retirement on self-perceived health, depression level and quality of life in Belgium: a longitudinal perspective using the Survey of Health, Ageing and Retirement in Europe (SHARE)

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Abstract

For about 20 years, Belgium has successfully implemented working-time reduction policies for the older workforce. However, the impact of such policies on health has not been explored yet. Using longitudinal data from Waves 5 and 6 of the Survey of Health, Ageing and Retirement in Europe (SHARE) (N = 1,498), the paper assesses whether working-time reduction in late career is associated with a change in self-perceived health, depression (EURO-D) and quality of life (CASP-12). For that purpose, ordered logit and ordinary least squares regressions are performed, using four different models for defining working-time reductions. Results show that people reducing working time with or without additional social benefits tend to have a poorer self-perceived health at follow-up compared with people keeping the same or increasing working time. By comparison, people moving to retirement are more likely to present a better self-perceived health, depression level and quality of life compared to people increasing or keeping the same working-time level. Although, introducing an interaction effect, the paper shows that the change in quality of life for respondents reducing working hours in addition to social benefits tends to be less negative for those who wished to retire early at baseline than for those who did not.

Keywords: working time; self-perceived health; CASP-12; EURO-D; Survey of Health, Ageing and Retirement in Europe (SHARE); longitudinal

Introduction

The impact of labour market transitions on the health of older workers is subject to a considerable amount of research using longitudinal methods, particularly suitable for assessing the change in health conditions over a selected type of transition. Among the different possible transitions, many articles have focused on the impact

of the transition from work to retirement, unemployment and inactivity on health (Graetz, 1993; Calvo, 2006; Waddell and Burton, 2006; Rice *et al.*, 2011; Burton-Jeangros *et al.*, 2015). For instance, comparing Denmark, France, Italy and England, Di Gessa and Grundy (2014) have demonstrated that engagement in paid work contributes to maintaining health in later life compared to people leaving the labour market. More recently, taking into consideration labour market histories (using retrospective data covering the full professional career), Di Gessa *et al.* (2016) have shown that the health benefits of working beyond the state pension age are no longer significant. However, even though the literature about these arrangements at the policy level (Bluestone and Rose, 1998; Andor, 2012; Berg *et al.*, 2015; Dubois *et al.*, 2016) or at workplace level (Lewis *et al.*, 2017; Wheatley, 2017) is sparse, little attention was given to part-time arrangements allowing older workers to reduce working time in a move towards retirement.

This paper assumes that the growing use of working-time arrangements in late career – supported by public policies in most European countries – should be taken into consideration in the study of retirement pathways and their association with health. On the one hand, an extensive literature shows that working hours and flexible working time affect health. This is particularly the case for overtime which tends to have negative effects on stress, sleep, and social and mental health (Costa *et al.*, 2004), but this is also the case for part-time work, particularly for male workers (Verbakel and Diprete, 2007). On the other hand, it has been shown that workers who are 'not free to lower their usual working hours, workers who [are] hours-constrained, or over-employed, [are] more likely to retire than workers who were free to adjust their work hours' (Charles and DeCicca, 2007; Fisher *et al.*, 2016). As job satisfaction may be pointed out as a factor affecting health – as the 'highest levels of health risk are found amongst dissatisfied workers and the lowest levels amongst satisfied workers' (Graetz, 1993) – working-time reduction in late career should be taken into consideration. This paper aims to provide some evidence using Belgium as a particularly good example of how working-time policies have shaped transitions to retirement.

For that purpose, there is a need to look at the policy level and understand the ongoing transformation of the labour market, particularly affecting older workers. The paper aims to describe working-time arrangements in late career in Belgium, providing descriptive data about their recent evolution and assessing whether these arrangements have an impact on the self-perceived health (SPH), the level of depression and the quality of life of older workers, compared to those reducing their working time with no additional social benefits, those keeping or increasing working time, and those leaving the labour market. Panel data from Waves 5 and 6 of the Survey of Health, Ageing and Retirement in Europe (SHARE) are used. The paper is made up of four sections. The first section takes a policy-oriented point of view by looking at the evolution of early retirement arrangements in Belgium with particular emphasis on the recent development of the so-called 'Time Credit Scheme' allowing older workers to reduce working time in addition to unemployment benefits partly compensating the income loss. Access criteria and rules associated with the 'time credit' are mentioned shortly and descriptive data showing the evolution over the last decade are presented. The second section presents the methodological background of the paper and provides an overview of

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the panel data used for assessing the impact of the time credit on health. The third section presents descriptive results and the results of the different models that are tested in this research. The fourth section sets out the main limitations of the paper. Finally, the discussion section summarises the main results presented in the paper and suggests some ways to look in depth at this matter in further research.

Contextual background: from early retirement to time credit

Forty years of public policy reforms have shaped the end of professional careers in Belgium. Historically, the Belgian labour market has long been characterised by low participation rates in late career, explained in large part by the implementation of the 'conventional early retirement' scheme in 1973 (Claes, 2012). This scheme was initially implemented for two reasons. First, it aimed to regulate the labour market by allowing companies to use older workers as an adjustment variable. Early retirement was a costless way to reduce the labour supply, in an economic context adversely affected by the first oil shock, without relaxing labour market regulations. Second, the scheme aimed, by reducing the older workers' employment participation, to integrate young people – affected by mass unemployment – into employment (Wels, 2014). While the first aspect of the 'conventional early retirement scheme' worked well with a strong decrease in older workers' employment participation in the 1970s, the second aspect was later considered to be a lump of labour fallacy (Jousten *et al.*, 2010). Initially, the scheme was planned to be temporary, as a direct response to the economic slump, but from 1976 to 1995, early exit arrangements were developed further. The implementation of the 'legal early-retirement' scheme between 1976 and 1982, and of the 'early-retirement pension' between 1982 and 1991 reinforced a trend that began in the 1970s, but while the conventional early retirement scheme required the dismissal of the worker, these two mechanisms opened the right to an early exit, independent of dismissal. From that time, workers can freely choose their retirement age without incurring a penalty (Jousten *et al.*, 2010: 50).

Despite partial reforms in the 1990s, the conventional early retirement scheme continued until 2012, when its name was changed and access criteria were significantly revised. The conventional early retirement scheme then became a so-called 'unemployment benefit with income supplement paid by the company' (*stelsel van werkloosheid met bedrijfstoeslag – chômage avec complement d'entreprise*) and the pre-pensioners of 60 years and more, previously exempt from job searches, were encouraged to make themselves available on the labour market (Sorée, 2015). The new name given to the conventional early retirement scheme has both symbolic and practical impact. Symbolically, the reform focuses on the institution paying for early retirement benefits. Indeed, the term *early retirement* could suggest that benefits were paid by the National Office for Pensions (ONP) while this was never the case: early retirement benefits are paid partially by the unemployment institution (National Employment Office – ONEm-RVA) and, to a lesser extent, by the dismissing company. The contribution paid by the company gradually increased, with few exceptions, between 1973 and 2012. From a practical point of view, the rules for accessing conventional early retirement were tightened. The minimum age for access to unemployment with supplement paid by the company

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increased from 58 to 60 years of age with at least 40 years of seniority (a longer transitional period for women was planned as the length of their career was – and still is – on average shorter). Moreover, under certain conditions, this seniority can be lowered to 35 years in the case of heavy work. At the same time, older workers' unemployment regulations were changed. Before 2014, unemployed people aged 60 and over were exempted from job searches with no other conditions. From 2014, the job search exemption remains for this age category but the unemployed need to be registered as a job seeker and be involved in the follow-up organised by the job centre. Furthermore, they cannot refuse a job offer from the job centre and need to live permanently in Belgium.

In the mid-1990s, when access to full-time early retirement was restricted, new arrangements were gradually implemented to facilitate the adjustment of working time at the end of the career. Both early retirement and working-time arrangements co-existed for a long time. For nearly 15 years, conventional early retirement continued to play an important role, while mechanisms such as part-time career breaks and half-time early retirement were emerging. In January 1985 a new system, the 'part-time career break', was implemented for older workers in the public sector. This was a first step towards the current time credit as public policies showed willingness to facilitate the reconciliation between family and professional life and to allow the replacement of individuals who reduce their working time. Facing an increasing unemployment rate among young people, the government was re-affirming its objective of job sharing, which was already one of the reasons for why early retirement schemes were implemented. The collective labour agreement (CCT) No. 55 of 1993 then introduced a 'half-time pre-pension' scheme, which entitled the ONEm-RVA to provide social benefits compensating, under certain conditions, the reduction in working time. However, unlike the part-time career break, the reduction in working hours is no longer necessarily compensated by hiring younger workers. The scheme was not very successful and did not affect the early retirement rate.

Following the 'part-time career break' and 'half-time early retirement', the time credit appeared in Belgium at the beginning of the 2000s, in a context characterised by high rates of early exit from the labour market. The creation of time credit in 2001 must be seen in the context of the Lisbon Treaty and the European Employment Strategy. Encouraged by the European Councils of Amsterdam, Lisbon, Stockholm and Barcelona, held between 1997 and 2002 (Salais, 2004), European countries implemented arrangements aiming at increasing the employment rate of older workers by smoothing the transition from work to retirement, through, for instance, the adjustment of working time at the end of a professional career. In 2004, a national action plan for employment set such targets at the national level. In this context, the time credit can be considered both as a career extension tool – as it largely replaced the use of early retirement schemes, which decreased in the 2000s, with the system being phased out in 2012 – and a tool for the organisation of working time.

End-of-career time credit establishes a right for workers aged 55 or over at the time of application to reduce working time, with additional unemployment benefits from the ONEm-RVA aiming to compensate the loss of income. Several other criteria are also considered. First, the employee must have at least 24 months of

seniority in the company (including assimilated periods) unless the employer and the employee agree to a derogation from this rule. Second, a career of at least 25 years (assimilated periods included) as an employee is required. Third, the time credit might be considered as a right only in companies of 11 workers or more. In 2012, an exception system was introduced for heavy work with a shortage of labour, and in companies undergoing restructuring. In these particular cases and under certain conditions (having had a heavy job for at least five years), the age for access to the end-of-career time credit might be reduced to 50 years of age. In practice, the time credit allows full-time workers working five days a week to reduce their weekly working hours by one-fifth, *i.e.* one day or two half-days a week. Some part-time workers are also entitled to time credit. Workers employed at four-fifths have the possibility of reducing their working time by one-fifth and workers employed at three-quarter time can reduce it to half-time. There is no maximum duration for these reductions in working time but there is a minimum duration: the reduction of the working hours of one-fifth must apply for at least six months and the half-time for a minimum of three months.

End-of-career time credit is also partly considered in the calculation of the employee's state pension. Before 2012, all periods of time credit after the age of 50 were calculated based on a 'notional dummy pay' (the notional dummy pay is usually calculated based on the real incomes before the time credit). The system was reformed in 2012 and, from 2013, the calculation of the amount of the pension changed (except for transitional measures for time-credit recipients under the old scheme). The calculation is now carried out as follows: in the case of heavy work and a reduction in working time of one-fifth, or in the case of 312 equivalent days following the month in which the age of 60 is reached, the calculation is based on the same 'notional dummy pay'. In other cases, the calculation is now based on a 'limited dummy pay', less advantageous than the previous one.

Currently, three main schemes shape the end of professional careers in Belgium: the 'time credit', the 'unemployment exempted from job search' and the 'unemployment benefits with income supplement' (the former early retirement scheme). Using data provided by the ONEm-RVA, Figure 1 shows the trends from January 2008 to August 2017 for the three kinds of arrangements concerning people aged 50 and over.

In August 2017, unemployment exempted from job search concerned 15,078 males and 14,220 females aged 50 and over; unemployment benefits with income supplement concerned 52,091 males and 23,005 females; and 15,232 males and 29,178 females were under a time-credit scheme. However, looking at the trends over the selected period, one observes a significant decrease in both unemployment exempted from job search and unemployment benefits with income supplement, while the number of people benefiting from a time-credit scheme increased. These recent trends confirm that public policies aim at discouraging early retirement while encouraging working-time reductions at the end of the career (Dejemeppe *et al.*, 2015). However, one should remain cautious about this assertion as it has been shown that 'participation in [a time-credit scheme] initially prolongs the time spent in employment (during the first two years for men and four years for women), but subsequently it accelerates the exit to early retirement' (Albanese *et al.*, 2015: 41).

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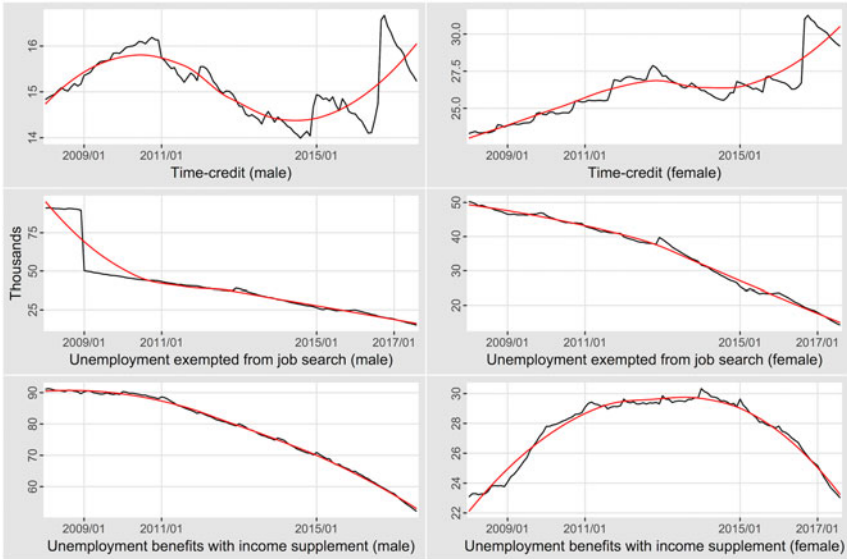

Figure 1. End-of-career time credit, unemployment exempted from job search and unemployment benefits with income supplement from January 2008 to August 2017, monthly data and loess curve (in thousands).
Source: National Employment Office (ONEm-RVA), author's calculation.

There are two additional remarks related to these figures. First, one can observe a difference between male and female, particularly when looking at the former early retirement scheme. This is particularly due to transitory measures that were made more gradual for female workers. Second, the linearity of the trends varies from one scheme to another. The time credit is indeed particularly affected by the economic activity as it depends on the employment participation of the older workers – which is less the case when looking at schemes allowing a total withdrawal from the labour market.

Data, variables and methods

Data

The paper uses data from Waves 5 and 6 of SHARE (Borsch-Supan, 2017). Compared with panel surveys such as the Health and Retirement Study (in the United States of America) or the English Longitudinal Survey of Ageing (in England), SHARE is not built using specific cohorts. Consequently, the sample contains respondents aged 50 and over followed over several waves and new respondents are included in the sample wave after wave. Therefore, it is relevant to use the last waves (in this case, Waves 5 and 6) as they reflect the current policy context. Wave 5 was completed in November 2013 and Wave 6 in November 2015. People aged 50 and over and declaring being in paid work (self-employed, employed or civil servant) at baseline (Wave 5) are selected and followed up to Wave 6, whatever their labour status is in Wave 6. Even though workers declaring being in paid work

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are selected at baseline, the sample is affected by a relatively high attrition rate. The original sample at baseline contains 1,498 respondents. At follow-up, the sample is 1,168 respondents. Put another way, 330 individuals dropped out from the survey between Waves 5 and 6; which can be estimated as a reduction of 22 percentage points. Looking at the characteristics of the population dropping out, it is observed that it contains 50 per cent males and 50 per cent females, with an average age at baseline of 55 for females and 56 for males. Interestingly, the attrition sample is composed of 80 per cent highly qualified workers (International Standard Classification of Education (ISCED) levels 5 and 6).

Dependent variables and statistical models

Health and quality of life were measured using three variables: SPH, depression level and quality of life. These three variables are pointed out by the scientific literature as particularly affected by employment (Kober and Eggleton, 2005) and retirement transitions (Coe and Zamarro, 2011). But they are also particularly affected by working time. Gains in quality of life from reducing working hours have been shown (Verbakel and Diprete, 2007), although it has to be assumed that the relationship between working hours and quality of life is non-linear (Drobnič *et al.*, 2010), mainly because lower working time might not always be voluntary.

Self-assessment of health 'clearly measures something more and something less than objective medical ratings' (Maddox and Douglass, 1973). For instance, it has been shown that self-rated health in an important predicator in explaining mortality (Idler and Benyamini, 1997). Furthermore, part of the problem when looking at 'objective' measurements of health is that they measure health as such rather than the 'capacity for work' (Bound, 1991) as SPH does. SPH was measured in terms of responses to the question: 'Would you say your health is…?', associated with five modalities: excellent, very good, good, fair or poor, coded from 1 to 5, respectively. The variable used in this paper is calculated as the difference between the value of SPH in Wave 5 and the value for the same variable in Wave 6. Therefore, a positive value means that a positive change was observed between baseline and follow-up. Conversely, a negative value means that a worsening SPH was reported at follow-up.

The second variable is the depression scale using the EURO-D indicator measuring depression on a scale from 1 (not depressed) to 12 (very depressed) (Prince *et al.*, 1999), covering 12 symptom domains: depressed mood, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment and tearfulness (Castro-Costa *et al.*, 2007). Like the change in SPH, the variable was calculated as the difference between what is observed in Wave 5 and what is observed in Wave 6. A positive change is associated with a value higher than zero while a negative change is associated with a value lower than zero.

Finally, the third variable is the quality of life (CASP-12) (Siegrist *et al.*, 2007; Borrat-Besson *et al.*, 2015) which is a shorter version of CASP-19 (Platts *et al.*, 2013). This is an index based on the answers to several questions about control, autonomy, pleasure and self-realisation. Even though CASP-12 is based on 12 questions (against 19 for CASP-19), it contains information about these four aspects.

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The quality of life index is ranked from 12 (the lowest) to 48 (the highest). The variable used in this paper is calculated as the difference between the value of CASP-12 observed in Wave 6 and the value of CASP-12 observed in Wave 5. Hence, it can be interpreted like the two previous variables: a positive value being associated with a positive change in quality of life and a negative value being associated with a negative change.

As the models aim to assess the association between health and change in working time, the models used in this paper assume a potential causal link between labour market transitions, on the one hand, and health and quality of life, on the other hand. As using a two-wave sequence does not ensure that a causal relationship is observed, the levels of SPH, EURO-D and CASP-12 are controlled at baseline. Furthermore, additional covariates (*see* below) are included in the models in order to control for the sector of activity (industry), the level of education, or whether the person worked continuously or not over the period. It would have been better to use a three-wave sequence that would allow the causality to be looked at directly, but this would have led to a drastic reduction in the size of the sample (and particularly of the size of the population reducing working time).

One issue with these variables is that they are numerical indicators built on ordinal questions, particularly in the case of SPH and EURO-D. Therefore, one can assume that the change calculated between Waves 5 and 6 reflects an ordinal change. If so, two main methods can apply: the ordered logit regression or the ordered probit regression (Winship and Mare, 1984). The benefits of using probit rather logit are not obvious but it can be assumed that the logit model tends to affect extreme values – due to the logarithmic scale that is used in the model – more than the probit model. However, the coefficients obtained through the ordered logit regression (log odds) are easier to interpret as they can be transformed into odds ratios, which is, by definition, not possible with the probit model. That is the reason why SPH and EURO-D variables are analysed in this paper using an ordered logit regression. The case of CASP-12 is slightly different as it is calculated on 12 Likert-scale indexes. Therefore, the change in CASP-12 is analysed using an ordinary least squares (OLS) regression, as done in other articles (for instance, *see* Howel, 2012).

As the sample attrition is particularly high for the selected sub-sample, models are calculated in two different ways. First, ordered logit models and the OLS regression are calculated based on the disposable data, excluding missing values. Second, ordered logit models and the OLS regression are calculated using random forest imputations. One of the benefits of using random forest imputations method is that it applies both to numerical and categorical variables, keeping the imputations homogeneous from one variable to another as it is able to capture non-linear selection models (Hayes *et al.*, 2015). For a description of the algorithms used in random forest and the benefits of using such a method, *see* Tang and Ishwaran (2017).

Independent variables

People in paid work are selected at baseline and what matters in this paper is the job situation (variable ep_005) they hold at follow-up, and particularly whether

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respondents reduced working time from Wave 5 to Wave 6. Therefore, several types of statuses at follow-up are distinguished depending on whether the person is still working, retired, unemployed, in long-term sickness or disability, home-worker or under another status. In the case of people remaining in paid work, a subdivision is made distinguishing respondents reducing working time, keeping the same working time or increasing working time over the period. The change in total hours worked per week is calculated as the difference between the weekly working time at follow-up and the weekly working time at baseline (variable ep_013). This categorical variable, distinguishing potential change in job situation and change in working time, is considered in this paper as our basic model (Model 0).

However, as the case of Belgium involves social benefits in addition to the working-time reduction (time credit), three other models (Models 1–3) are developed, aiming to capture the potential impact of working-time reduction with social benefits on the change in SPH, depression level and quality of life. Although SHARE contains country-level information about social benefits, no information about time credit was collected in Belgium in the disposable waves. Therefore, while the process of merging SHARE data with Belgian administrative data is ongoing, there is a need to develop assumptions. One way to do it is to look at the change in social benefits from one period to another and assume that a change in unemployment benefits associated with a decrease in working time would correspond to a case of time credit. Conversely, a decrease in working time which is not associated with a change is social benefits should be considered as a working-time reduction which is not supported by social benefits. Hence, three aspects are taken into consideration for doing so: the change in job situation (ep_005), the change in weekly working time (ep_013) and the change in income sources (ep_071 in Wave 5 and ep_671 in Wave 6).

Based on these three aspects, three models using three different assumptions are made for distinguishing people in time credit from people who reduce working time without a time credit:

- In Model 1, a broad definition of social benefits is chosen by taking into consideration people declaring benefiting from unemployment benefits, pension benefits or early retirement benefits in Wave 6.
- In Model 2, a limited definition of social benefits is given as it looks at the evolution of unemployment benefits (only) from Wave 5 to Wave 6. Put another way, Model 2 selects people reducing working time in addition to social benefits if there is an increase in unemployment benefits over the period.
- Finally, Model 3 is an intermediary model mixing the longitudinal approach of Model 2 with the broad definition of social benefits including unemployment benefits, pension benefits and early retirement benefits used in Model 1.

Model 2 is the one that fits the best with the definition of what the time credit is in Belgium as it takes into consideration the change in unemployment benefits associated with the change in working time only. By comparison, Model 3 includes pension benefits and early retirement benefits. The main reason why these three models are taken into consideration is the potential lack of understanding and

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the potential bias in replying to the questionnaire as no information is asked about this specific aspect.

Covariates

Both the ordered logit models and the OLS regression include several covariates that are selected based on what is usually pointed out by the scientific literature about this topic (for an extensive justification, *see* Wels, 2016). The gender of respondents is included in the models as a dichotomous variable for which the answer modality 'male' is selected as the reference category. Age is also controlled by the model as a numerical variable. The level of education based on the ISCED is taken into consideration. The variable is decomposed in three modalities: ISCED0–1 corresponds to no education or the lowest level of education, ISCED2–4 is the intermediary level of education and ISCED5–6, selected as the reference category, corresponds to the highest levels of education. The marital status distinguishing single people, widowed respondents, and married and living together (reference category) is included. So is a categorical variable distinguishing respondents working in the private sector (reference category), self-employees and public-sector workers, and a dichotomous variable distinguishing respondents who declared at baseline that they wish to retire early or not (reference category), and another dichotomous variable distinguishing respondents who worked continuously from Wave 5 to Wave 6 from people who did not (reference category). The model also controls for two wealth-related numerical variables: the yearly net income of the household, including earnings and social benefits (on a natural logarithmic scale) and the total household wealth (on a natural logarithmic scale). Finally, the models control for the type of industry in which respondents are working ('financial intermediation' is selected as the reference category). To reduce the amount of data, not all covariates are shown in the tables.

Results

The Results section is divided into five sub-sections. The first sub-section provides some descriptive data related to the different statistics used in the paper. The second sub-section presents results of the ordered logit models and OLS regression for the change in SPH, depression level and quality of life for some of the covariates included in the models. The third sub-section presents results for Model 0, *i.e.* looking at the change of working time without taking into consideration the change in social benefits. The fourth sub-section looks at the results of the regressive models for the change in working time and social benefits (Models 1–3). Finally, the fifth sub-section presents the results when an interaction effect is introduced in the model, looking at the interaction between wishing to retire early and reducing working time.

Descriptive statistics

Figure 2 shows the distribution (looking at the total sample without taking into consideration attrition) for the change in SPH, depression level (EURO-D) and quality of life (CASP-121). It shows particularly the change in SPH contains just

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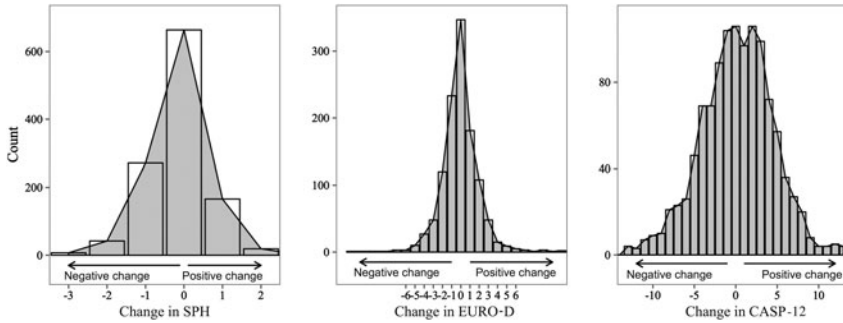

Figure 2. Distribution of the change in self-perceived health (SPH), depression (EURO-D) and quality of life (CASP-12).

a few modalities and that both the distribution of the change in SPH and the change in EURO-D look more like a Poisson distribution than a normal distribution which justifies the use of an ordered model (in this case, the paper uses an ordered logit model). The change in CASP-12 is composed of many modalities and the distribution has the characteristics of a normal distribution, justifying the use of an OLS regression.

Table 1 provides information about the dependent variable which the paper is investigating. The table shows both the number of respondents in each category and the percentage they represent among all respondents. Model 0 is the original model, looking at the change in working time only. Models 1–3 combine information about the change in working time and the change in social benefits. What can be observed when looking at the original model (Model 0) is that the percentage of respondents retiring from Wave 5 to Wave 6 counts for 11 per cent of the original sub-sample. Transition to unemployment is quite rare (1.4%) and the transition to permanent sickness or disability is higher (1.9%). Most of the respondents remained in paid work from Wave 5 to Wave 6 (84.4 out of 100), 30.4 per cent of the original sub-sample kept the same working time over the period, while 22 per cent declared an increase in working time and 32 per cent declared a decrease in working time from Wave 5 to Wave 6. When looking at the change in social benefits (Models 1–3), the percentage of people reducing working time in addition to social benefits is relatively low (4.3, 1.4 and 2.7% of the original sample, respectively), which indicates that taking into consideration social benefits would lead to an underestimation of the percentage of time credit.

The variable distinguishing respondents who want to retire early at baseline from respondents who do not is also interesting. For the total sample, the results show that 33.4 per cent of the respondents declared a wish to retire early at baseline, 34.2 per cent when looking at male workers and 32.6 per cent when looking at female workers. Among the respondents wishing to retire at baseline, 18.4 per cent were retired at follow-up, 27.5 per cent reduced working time, 27.3 per cent kept the same working time and, surprisingly, 19.7 increased working time.

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Table 1. Models summary, total population and percentages

	Model 0	Model 1	Model 2	Model 3
		Frequencies (%)		
Retired	128 (11)	–	–	–
Unemployed	16 (1.4)	–	–	–
Sick or disabled	22 (1.9)	–	–	–
Home-maker	5 (0.4)	–	–	–
Other	5 (0.4)	–	–	–
No information	6 (0.5)	–	–	–
Working time:				
Same	355 (30.4)			
Same or higher	–	611 (52.3)	611 (52.3)	611 (52.3)
Increase	257 (22)	–	–	–
Decrease and benefits	–	50 (4.3)	16 (1.4)	31 (2.7)
Decrease	374 (32)	325 (27.8)	359 (30.7)	344 (29.5)
Total	1,168 (100)	1,168 (100)	1,168 (100)	1,168 (100)

Results for the covariates

Table 2 shows results for some of the covariates that are taken into consideration when using the original model (Model 0) for the independent variable looking at job transitions from Wave 5 to Wave 6. It shows some interesting results. First, it can be clearly assumed that female workers at baseline are more likely than male workers at baseline to be affected by a negative change in depression level – in other words, the level of depression at follow-up tends to be worse for women. As the EURO-D is calculated using an ordered logit model, coefficients (log odds) can be easily transformed into odds ratios (by calculating the exponentials of the log odds). Odds ratios are 0.65 and 0.74, respectively, for the original model and for the model using random forest imputations which means that females are 35 and 26 percentage points, respectively, less likely to experience a positive change in depression level than men. Table 2 also shows that those who worked in the public sector in Wave 5 are more likely to experience a positive change in both depression level (only after imputations) and in quality of life (with or without imputations) compared to workers in the private sector at baseline. Independently, but in the same vein, respondents who worked continuously between Waves 5 and 6 are more likely to experience a positive change in SPH and quality of life; that is also true for the change in depression scale but only after imputations. For CASP-12 (OLS regression), workers who worked continuously from Wave 5 to Wave 6 show a greater change in CASP-12, of 1.28 and 1.22, respectively, when looking at the marginal effect (slope). Not surprisingly, it can also be observed that incomes and household wealth have a positive effect on the change in SPH, depression and quality of life, which is consistent with what can be observed in the literature (Benzeval *et al.*, 2014; Yamada *et al.*, 2015).

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Table 2. Selected covariates in Model 0

	SPH		EURO-D		CASP-12	
		rf		rf		rf
	Ordered logit regression (95% CI)				*OLS regression (95% CI)*	
Female	0.04	0.04	−0.43***	−0.30***	0.18	0.09
	(−0.22, 0.30)	(−0.07, 0.14)	(−0.66, −0.19)	(−0.40, −0.21)	(−0.35, 0.71)	(−0.11, 0.29)
Age	0.01	0.01	0.01	−0.01	0.10***	0.09***
	(−0.02, 0.04)	(−0.01, 0.02)	(−0.03, 0.03)	(−0.01, 0.01)	(0.03, 0.17)	(0.07, 0.12)
Civil servant	−0.14	−0.02	0.23	0.13**	0.72*	0.60***
	(−0.51, 0.24)	(−0.17, 0.119)	(−0.10, 0.56)	(0.01, 0.26)	(−0.04, 1.47)	(0.32, 0.88)
Self-employed	0.17	0.16**	−0.03	−0.01	0.41	0.26*
	(−0.22, 0.57)	(0.01, 0.32)	(−0.38, 0.31)	(−0.14, 0.13)	(−0.40, 1.22)	(−0.05, 0.57)
Wish to retire early	−0.65***	−0.55***	−0.23*	−0.19***	−0.15	−0.09
	(−0.91, −0.38)	(−0.65, −0.45)	(−0.47, 0.012)	(−0.29, −0.10)	(−0.69, 0.39)	(−0.29, 0.11)
Continuous work	0.60**	0.57***	0.43	0.45***	1.28**	1.22***
	(0.02, 1.19)	(0.31, 0.82)	(−0.09, 0.95)	(0.22, 0.68)	(0.11, 2.45)	(0.72, 1.72)
Household incomes	0.17**	0.12***	0.09	0.05**	0.25	0.22***
	(0.01, 0.33)	(0.06, 0.19)	(−0.05, 0.23)	(0.01, 0.11)	(−0.07, 0.57)	(0.10, 0.34)
Earnings	0.04	0.03***	−0.01	0.02*	0.11*	0.07***
	(−0.01, 0.10)	(0.01, 0.05)	(−0.05, 0.05)	(−0.01, 0.04)	(−0.01, 0.22)	(0.03, 0.12)

Notes: SPH: self-perceived health. EURO-D: depression scale. CASP-12: quality of life measure. OLS: ordinary least squares. rf: random forest. CI: confidence interval.
Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Model 0

Results observed for the change in job status from Wave 5 to Wave 6 (Model 0) are presented in Table 3. When looking at the table, what can be observed is that, compared with people moving to retirement from Wave 5 to Wave 6, all other kinds of transitions are associated with a negative change in self-reported health, depression and quality of life and, overall, this change is significant. In other words, this means that nothing is better for health, depression level and quality of life than retiring. When looking at the details for the different variables, some nuances appear. First, and this is consistent with what would have been expected, people moving from employment to permanent sickness or disability are highly likely to be affected by a negative change in SPH, EURO-D and CASP-12. This negative association is significant with or without imputations. As the total number of people moving to unemployment is low, results are not significant for the transition from work to unemployment for the change in SPH and EURO-D but the imputations lead to significant results when looking at the change in quality of life. The slope is −2.07 and significant at 95 per cent. It can therefore be assumed that moving to unemployment at old age leads to a reduction in the change in quality of life which can be estimated between −3.01 and −1.13, compared to people experiencing a transition from work to retirement. When looking at people remaining in employment in Wave 6, it is difficult to distinguish – when selecting the transition to retirement as the reference category – whether people reducing working time would be less likely than people keeping the same or increasing working time to experience a change in SPH, EURO-D and CASP-12. In the three cases (same working time, higher working time or lower working time), coefficients are negatively and significantly associated with a negative change in SPH, EURO-D and CASP-12 but confidence intervals overlap, which makes the comparison difficult.

Models 1–3

Up to now, we do know that compared with those who retired at follow-up, respondents remaining in paid work are more likely to experience a negative change in SPH, EURO-D and CASP-12, and this is observed independently from the change in working time. There are two ways to look in depth at this point. First, we can select another reference category for the change in status from Wave 5 to Wave 6. Second, we can use the assumptions (Models 1–3) and distinguish those who reduce working time in addition to social benefits from those who reduce working time without social benefits – keeping in mind that the number of people declaring reducing working time in addition to social benefits might be underestimated; this is done in Table 4. More concretely, Table 4 shows the results for Models 1–3 (distinguishing working time reduction with and without social benefits based on three different assumptions – as mentioned above) and taking as a reference category a null or positive change in working time. To keep the table tidy, only working-time reduction and transition to retirement are shown. What can be observed in this table? First, looking at the change in depression level, it can be observed that, compared to respondents keeping the same working time or increasing it over the period, people reducing working time without social benefits are more likely to

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Table 3. Association between labour market transitions and self-perceived health, depression level and quality of life (Model 0)

	SPH		EURO-D		CASP-12	
		rf		rf		rf
	Ordered logit regression (95% CI)				*OLS regression (95% CI)*	
Unemployed	−0.04	−0.22	0.11	0.01	−1.90	−2.07***
	(−1.13, 1.05)	(−0.70, 0.27)	(−0.86, 1.08)	(−0.42, 0.43)	(−4.18, 0.39)	(−3.01, −1.13)
Sick or disabled	−2.56***	−2.32***	−1.74***	−1.63***	−1.95*	−1.91***
	(−3.51, −1.60)	(−2.74, −1.91)	(−2.65, −0.84)	(−2.03, −1.22)	(−3.92, 0.02)	(−2.73, −1.08)
Home-maker	−1.34	−1.48***	0.76	0.69*	1.32	0.75
	(−3.07, 0.39)	(−2.24, −0.72)	(−0.79, 2.32)	(−0.01, 1.39)	(−2.73, 5.37)	(−0.85, 2.36)
Other	−0.57	−0.74*	−0.59	−0.47	−1.65	−1.81**
	(−2.45, 1.31)	(−1.57, 0.10)	(−2.25, 1.07)	(−1.21, 0.27)	(−5.35, 2.05)	(−3.43, −0.20)
Decrease working time	−1.10***	−1.13***	−0.83***	−0.86***	−1.60**	−1.51***
	(−1.80, −0.40)	(−1.43, −0.82)	(−1.45, −0.21)	(−1.13, −0.58)	(−3.01, −0.19)	(−2.11, −0.91)
Increase working time	−0.91**	−0.95***	−0.95***	−1.01***	−1.86**	−1.77***
	(−1.63, −0.19)	(−1.27, −0.63)	(−1.59, −0.31)	(−1.29, −0.73)	(−3.32, −0.39)	(−2.39, −1.15)
Same working time	−0.81**	−0.82***	−1.06***	−1.08***	−1.37*	−1.33***
	(−1.52, −0.10)	(−1.13, −0.51)	(−1.70, −0.43)	(−1.37, −0.80)	(−2.81, 0.06)	(−1.94, −0.73)

Notes: SPH: self-perceived health. EURO-D: depression scale. CASP-12: quality of life measure. OLS: ordinary least squares. rf: random forest. CI: confidence interval.
Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Association between labour market transitions and self-perceived health, depression level and quality of life (Models 1-3)

	SPH		EURO-D		CASP-12	
		rf		rf		rf
	Ordered logit regression (95% CI)				*OLS regression (95% CI)*	
Model 1:						
Retirement	0.90**	0.95***	0.94***	0.97***	1.39*	1.40***
	(0.19, 1.62)	(0.63, 1.26)	(0.31, 1.58)	(0.69, 1.25)	(−0.05, 2.83)	(0.78, 2.01)
Working time reduction plus social benefits	−0.42	−0.43***	−0.33	−0.25**	−0.87	−0.90***
	(−1.03, 0.19)	(−0.70, −0.16)	(−0.85, 0.18)	(−0.48, −0.02)	(−2.11, 0.37)	(−1.43, −0.36)
Working time reduction without social benefits	−0.22	−0.22***	0.27**	0.28***	0.11	0.18
	(−0.50, 0.05)	(−0.35, −0.10)	(0.02, 0.52)	(0.17, 0.39)	(−0.45, 0.68)	(−0.06, 0.43)
Model 2:						
Retirement	0.92**	0.96***	0.98***	1.00***	1.46**	1.46***
	(0.21, 1.63)	(0.65, 1.27)	(0.35, 1.62)	(0.72, 1.28)	(0.03, 2.90)	(0.85, 2.07)
Working time reduction plus social benefits	−0.44	−0.40*	−0.49	−0.37*	−0.92	−0.92**
	(−1.49, 0.60)	(−0.86, 0.06)	(−1.32, 0.34)	(−0.74, 0.01)	(−2.96, 1.11)	(−1.82, −0.02)
Working time reduction without social benefits	−0.24*	−0.24***	0.23*	0.24***	0.03	0.09
	(−0.51, 0.03)	(−0.36, −0.12)	(−0.01, 0.47)	(0.13, 0.34)	(−0.51, 0.58)	(−0.15, 0.33)
Model 3:						
Retirement	0.91**	0.95***	1.01***	1.01***	1.51**	1.52***

(*Continued*)

Table 4. (*Continued.*)

	SPH		EURO-D		CASP-12	
		rf		rf		rf
	(0.20, 1.63)	(0.64, 1.27)	(0.36, 1.64)	(0.73, 1.30)	(0.07, 2.97)	(0.91, 2.13)
Working time reduction plus social benefits	−0.63	−0.63***	−0.16	−0.08	−0.22	−0.28
	(−1.40, 0.14)	(−0.96, −0.29)	(−0.78, 0.47)	(−0.35, 0.20)	(−1.77, 1.33)	(−0.95, 0.39)
Working time reduction without social benefits	−0.22	−0.22***	0.22*	0.23***	−0.01	0.06
	(−0.49, 0.05)	(−0.344, −0.102)	(−0.02, 0.46)	(0.12, 0.34)	(−0.56, 0.54)	(−0.18, 0.30)

Notes: SPH: self-perceived health. EURO-D: depression scale. CASP-12: quality of life measure. OLS: ordinary least squares. rf: random forest. Reference category: same or higher working time. CI: confidence interval.
Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

experience a positive change in EURO-D, and this is true in the three models and with or without imputations. By contrast, respondents reducing working time in addition to social benefits are more likely to be affected by a negative change in EURO-D. This is true when looking at Models 1 and 2, after imputations, but results are not significant in Model 3. This would lead to the preliminary conclusion that, in terms of change in depression level, working-time reduction associated with social benefits tends to lead to poorer health compared with respondents keeping the same working time or increasing it (and after controlling for depression at baseline and other covariates). A similar conclusion can be drawn when looking at the change in quality of life. Coefficients are not significant when looking at working-time reduction without social benefits but when there are social benefits compensating the income loss, a negative association (and significant after imputations) can be observed for Models 1 and 2. Finally, when looking at the change in SPH, a negative association is observed for people reducing working time compared to people keeping the same or increasing working hours but the model does not allow a difference to be made between people reducing working time in addition to social benefits and people reducing working time without social benefits.

In summary, three main findings are observed and they vary depending on the type of health indicator we are looking at. The change in SPH tends to be negative when decreasing working time independently from social benefits. The change in EURO-D tends to be negative for people reducing working time in addition to social benefits but positive for people reducing working time without social benefits. The change in CASP-12 tends to be negative for those reducing working time with social benefits but non-significant for those who reduce working time without social benefits. Among the different models used for calculating social benefits, Models 1 and 2 provide results that tend to be significant while they tend to be non-significant for Model 3. As mentioned previously, Model 2 is the one that fits the best with the definition of time credit. One would conclude this sub-section by assuming that the time credit – using the assumption stated above – tends to have a negative impact on SPH, depression and quality of life compared to people keeping the same or increasing working time.

Interaction between wish to retire early and professional transition

As one of the purposes of the time credit was to replace early retirement schemes, it might be interesting to look at the interaction between working-time reduction and whether the respondent wished to retire early at baseline. As shown in the first section of this paper, the time credit is a kind of substitute for early retirement schemes and it can be expected that older workers would choose a time credit when access to early retirement is made more difficult (Albanese *et al.*, 2015; Cockx *et al.*, 2010). The introduction of an interaction effect between two variables in a regressive model basically provides three coefficients: one coefficient for the first variable, one for the second and a third coefficient looking at the association between the first and the second variables. What is provided in Table 5 is the sum of the coefficient for the variable 'early retirement' (respondents who want to retire at baseline) and the coefficient for the interaction variable 'early retirement × reduce working time' (respondents who want to retire at baseline and reduced

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Table 5. Interaction effect for Models 0–3

	SPH		EURO-D		CASP-12	
		rf		rf		rf
	Ordered logit regression (95% CI)				*OLS regression (95% CI)*	
Model 0:						
Increase working time[1]	−1.05*	−0.67**	−0.92	0.06	−1.07	−1.01*
	(−2.26, 0.15)	(−1.54, −0.48)	(−1.17, 0.96)	(−0.43, 0.86)	(−3.51, 1.37)	(−1.95, 0.1)
Reduce working time[1]	−0.47	−0.88	0.8	−0.06	0.5	0.65
	(−1.21, 1.56)	(−1.51, 0.75)	(−1.22, 0.89)	(−0.51, 0.68)	(−1.8, 2.81)	(−0.35, 1.65)
Model 1:						
Working time reduction plus social benefits[2]	0.62	0.67*	0.37	0.43	1.64	1.79***
	(−1.04, 2.28)	(−0.06, 1.41)	(−1.08, 1.81)	(−0.22, 1.07)	(−1.76, 5.04)	(0.41, 3.39)
Working time reduction without social benefits[2]	−0.67	−0.63**	−0.24	−0.13	0.38	0.51
	(−1.64, 0.30)	(−1.06, −0.20)	(−1.13, 0.65)	(−0.52, 0.27)	(−1.59, 2.34)	(−0.35, 1.37)
Model 2:						
Working time reduction plus social benefits[2]	−0.31	−0.39	0.17	0.15	2.49	2.79***
	(−2.79, 2.16)	(−1.47, 0.70)	(−1.87, 2.56)	(−0.77, 1.06)	(−0.48, 7.33)	(0.64, 4.93)
Working time reduction without social benefits[2]	−0.49	−0.45**	−0.17	−0.05	0.45	0.60
	(−1.45, 0.46)	(−0.87, −0.03)	(−1.04, 1.06)	(−0.44, 0.33)	(−1.35, 2.38)	(−0.24, 1.45)

Model 3:						
Working time reduction plus social benefits[2]	1.38	1.29	0.53	0.56*	1.11	1.26
	(−0.49, 3.25)	(0.47, 2.11)	(−1.05, 2.11)	(−0.14, 1.26)	(−2.73, 4.94)	(−0.42, 2.94)
Working time reduction without social benefits[2]	−0.67	−0.62**	−0.22	−0.10	0.52	0.67
	(−1.64, 0.30)	(−1.05, −0.19)	(−1.10, 0.67)	(−0.50, 0.29)	(−1.44, 2.48)	(−0.18, 1.96)

Notes: SPH: self-perceived health. EURO-D: depression scale. CASP-12: quality of life measure. OLS: ordinary least squares. rf: random forest. CI: confidence interval. Coefficients are calculated as the sum of the coefficients for the variable measuring whether the respondent wished to retire early at baseline and the interaction between wishing to retire and the variables shown in the table. Consequently, coefficients show what wishing to retire early at baseline adds in terms of coefficients (log odds for SPH and EURO-D and slope for CASP-12). 1. Reference category: same working time. 2. Reference category: same or higher working time.
Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

working time from baseline to follow-up). This shows what is the specific impact on health of wishing to retire early at baseline in relation with those who did not want to retire early at baseline. In other words, coefficients can be interpreted as what wishing to retire early at baseline adds to the model.[1]

As the number of respondents reducing working time and the number of respondents wishing to retire at baseline is relatively low, low significance can be expected – and that is the case when looking at Table 5. However, a few interesting observations can be drawn, particularly when looking at the change in quality of life.

Looking at Model 0, we can observe that people who wished to retire early at baseline and for whom working hours have increased are affected by a negative change in SPH. When taking into consideration the imputations related to missing data, it can be assumed that the odds of being affected by a positive change in SPH are from 38 to 78 percentage points lower for those who wanted early retirement at baseline. Other results are not significant. When looking at Models 1–3, what appears, particularly in Models 1 and 2, is that those who reduced working time in addition to social benefits and wanted to retire early at baseline are more likely to experience a positive change in quality of life compared with those who kept the same working time or increased it and did not want to retire early (wishing to retire at baseline adds 1.79 and 2.79 units, respectively, to the slope, significant at 95%). Put another way, even though it can be observed that reducing working time with social benefits tends to lead to a negative change in CASP-12 compared with those keeping the same working time or increasing it, those who wanted to retire early in Wave 5 are less likely than those who did not want to retire early to be affected by a negative change in quality of life. However, even though wishing to retire at baseline reduces the odds of being affected by a negative change in quality of life for people reducing working time with social benefits (in Models 1 and 2) compared with people keeping the same working hours or increasing working time, it is impossible to say – because of the size of the confidence interval – whether reducing working time in addition to social benefits for people wishing to retire early at baseline would have a positive or negative impact on health.[2]

Finally, another interesting point is about those who reduced working time without social benefits. It can be observed in Models 1–3 that those who wished to retire early and reduced working time without social benefits are less likely to experience a positive change in SPH – in comparison with those who increased or kept the same working time – compared with those who did not want to early retire.

Limitations

This research contains four main limitations.

(1) It assesses the association between working-time reduction and SPH, quality of life and depression level at a certain point in time and does not look at the change in this association from one period to another. Waves 5 and 6 were completed in November 2013 and November 2015, respectively, whilst the original time-credit scheme had already been overhauled. The association captured in this paper corresponds to what was observed during a particular

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period, particularly characterised both by restricted access to this arrangement and by a less positive impact on the calculation of the state pension.

(2) It is based on a two-wave sequence and does not capture the long-run changes in SPH, depression level and quality of life. Even though extending the analysis to three waves would not be likely to affect the sense of the association significantly (Wels, 2018), it can be expected that the long-run impact of change in working time might differ from the short-term impact (Coe and Zamarro, 2011). Although, this would reduce the size of the sample drastically, particularly because of a relatively high attrition rate.

(3) It controls for the sector of activity but does not look in depth at what the dynamics are that might be observed at the sector level, particularly in sectors of activity characterised by shift work, night work or short-term contracts.

(4) It uses different models for distinguishing those who reduced working time in addition to social benefits from those who did not. The type of model that is used slightly affects the distribution between these two groups. Hence, we must assume a certain degree of uncertainty when analyzing the results for the different models. This would not have been the case if the question were directly asked in the survey. Furthermore, we were unable to distinguish the whole range of arrangements used for reducing working time in the lead-up to retirement (for a comparative overview of these schemes, *see* Wels, in press).

Discussion

What do the results presented in this paper mean in terms of public policy?

First, they highlight the necessity of looking carefully at the heterogeneity of the different types of transitions to retirement, particularly taking into consideration working-time reductions in late career. These different types of trajectories towards retirement do not have the same nature as they correspond to different types of arrangement. The case of working-time reduction in late career is particularly significant as, in Belgium, the reduction might be associated with additional social benefits aiming to cover the income loss, but it might also not be covered by any kind of financial transfer coming from the state. What the paper clearly shows is that working-time reductions in late career tend to be associated with a negative change in SPH, depression level and quality of life.

Second, one also needs to take into consideration institutional changes that occurred over the selected period to understand the types of arrangement workers use before retiring. Using such a policy-oriented perspective, one may observe that the rise in time credit in Belgium may be explained by a strong reduction in the use of early retirement schemes. The time credit is, at least partly, explained by restricted access to arrangements that were used in the past for retiring before the pension age. What is obvious in terms of public policies is that part-time arrangements in late career were implemented following previous early retirement schemes (in countries where these schemes were implemented) and are, in their implementation, the extension of those schemes. These path dependencies (Palier, 2002) in the way working time can be reduced in late career play a great role in explaining arrangements implemented at the national level. This raises an

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issue about targeting a specific kind of arrangement within an international database which does not provide all the necessary information to do so. The paper investigates three different models and results seem to be consistent, *i.e.* no significant difference is observed when comparing the models. But they should be taken with caution as they are post-calculated models.

Third, one may assume that the heterogeneity in working-time reduction leads to different types of change in health once the working time is reduced. Results observed above suggest that – once controlled for external factors – the transition from work to retirement affects health, depression and quality of life positively, while reducing working time with or without additional social benefits is associated with a deterioration in health, depression and quality of life within the sequence. The paper uses an interaction effect between wishing to retire at baseline and the type of working-time transition over the period. What appears is that people wishing to retire early and reducing working time in addition to social benefits tend to be less affected by a negative change in quality of life compared to those who did not want to retire early at baseline. However, these results correspond to what is observed over a relatively short time sequence (two to three years in this case) and – as it is established that the benefits of retiring in terms of SPH tend to vary depending on the length of the sequence (Coe and Zamarro, 2011) – it would be relevant to look in further research at what happens over a longer time period. Further research will be developed in the coming years. The process of merging SHARE data with administrative data is ongoing and this will lead to more accurate estimates in terms of how public policies affect health and quality of life in late career.

Notes

1 Put another way, the interaction effect in the regressive model may be written as: $H = \beta_a \times A + \beta_b \times B + \beta_c(A \times B)$, where H is the dependent variable, A and B are two independent variables (in this case, early retirement wish and the type of transition), β_a and β_b are the coefficients related to each variable (either the log odds in the ordered logit model or the slope in the OLS regression) and β_c is the coefficient measuring the interaction between variables A and B. In our model, we can assume that A is a binary variable distinguishing people who want to retire early at baseline from people who do not. It is therefore coded 0 or 1. B is the type of transition, including the type of change in working time. Therefore, the coefficient explaining H can be calculated as follows when the person does not want to retire early at baseline: $H = \beta_a \times 0 + \beta_b \times B + \beta_c(0 \times B) = \beta_b \times B = \beta_b$; and, similarly, the coefficient explaining H can be calculated as follows when the respondent wants to retire early: $H = \beta_a \times 1 + \beta_b \times B + \beta_c(1 \times B) = \beta_a + (\beta_b \times B) + (\beta_c \times B) = \beta_a + \beta_b + \beta_c$. So, the difference between wishing to retire early or not is simply $\beta_a + \beta_c$, as shown in Table 5.

2 These results are not shown in Table 5 but are calculated as follow:$\beta_a + \beta_b + \beta_c$. For the change in CASP-12, for Model 1, the coefficient for people reducing working time in addition to social benefits is 0.02 (95% confidence interval (CI) = −4.86, 4.91) and 0.06 (95% CI = −1.96, 2.3) after imputations. For Model 2, the coefficient is −2.25 (95% CI = −4.97, 0.48) and −2.33 (95% CI = −3.54, 1.12) after imputations.

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References

Albanese A, Thuy Y, Albanese A and Cockx B (2015) Working time reductions at the end of the career: do they prolong the time spent in employment? IZA Discussion Paper, 9619: 51.

Andor L (2012) Employment trends and policies for older workers in the recession, European Foundation for the Improvement of Living and Working Conditions: 1–12, ec.europa.eu/social/BlobServlet?docId=9590&langId=en

https://doi.org/10.1017/S0144686X18001149 Published online by Cambridge University Press

Benzeval M, Bond L, Campbell M, Egan M, Lorenc T, Petticrew M and Popham F (2014) *How Does Money Influence Health?* York, UK: Joseph Rowntree Foundation.

Berg P, Hamman MK, Piszczek MM and Ruhm CJ (2015) Can policy facilitate partial retirement? Evidence from Germany. National Bureau of Economic Research, Cambridge, MA, NBER Working Paper 21478: 49.

Bluestone B and Rose S (1998) The macroeconomics of work time. *Review of Social Economy* **LVI**, 425–441.

Borrat-Besson C, Ryser V-A and Goncalves J (2015) An evaluation of the CASP-12 scale used in the Survey of Health, Ageing and Retirement in Europe (SHARE) to measure Quality of Life among people aged 50 + . Swiss Centre of Expertise in the Social Sciences, Geneva, FORS Working Paper 4.

Börsch-Supan A (2018) Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6. Release version: 6.1.1. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w6.611.

Bound J (1991) Self-reported vs. objective measures of health in retirement models. *Journal of Human Resources* **26**, 106–138.

Burton-Jeangros C, Editors DB, Howe LD, Firestone R, Tilling K and Lawlor DA (Eds) (2015) *A Life Course Perspective on Health Trajectories and Transitions*. Springer, Series Volume 4, 213. doi: 10.1007/978-3-319-20484-0.

Calvo E (2006) Does working longer make people healthier and happier? *Work Opportunities for Older Americans* **2**, 14.

Castro-Costa E, Dewey M, Stewart R, Banerjee S and Huppert F (2007) Prevalence of depressive symptoms and syndromes in later life in ten European countries: the SHARE study. *British Journal of Psychiatry* **191**, 393–401.

Charles KK and DeCicca P (2007) Hours flexibility and retirement. *Economic Inquiry* **45**, 251–267.

Claes T (2012) La prépension conventionnelle (1974–2012). *Courrier hebdomadaire du CRISP* **2154/2155**, 5–94.

Cockx B, Goebel C and Robin S (2010) L'effet sur l'emploi du complément de revenu au travail à temps partiel en Belgique. *Revue économique* **61**, 299.

Coe NB and Zamarro G (2011) Retirement effects on health in Europe. *Journal of Health Economics* **30**, 77–86.

Costa G, Åkerstedt T, Nachreiner F, Baltieri F, Carvalhais J, Folkard S, Dresen MF, Gadbois C, Gartner J, Sukalo HG, Härmä M, Kandolin I, Sartori S and Silvério J (2004) Flexible working hours, health, and well-being in Europe: some considerations from a SALTSA project. *Chronobiology International* **21**, 831–844.

Dejemeppe M, Smith C and der Linden B (2015) Did the Intergenerational Solidarity Pact increase the employment rate of older workers in Belgium? A macro-econometric evaluation. *IZA Journal of Labor Policy* **4**, 17.

Di Gessa G, Corna LM, Platts LG, Worts D, McDonough P, Sacker A, Price D and Glaser K (2016) Is being in paid work beyond state pension age beneficial for health? Evidence from England using a life-course approach. *Journal of Epidemiology and Community Health*.

Di Gessa G and Grundy E (2014) The relationship between active ageing and health using longitudinal data from Denmark, France, Italy and England. *Journal of Epidemiology & Community Health* **68**, 261–267.

Drobnič S, Beham B and Präg P (2010) Good job, good life? Working conditions and quality of life in Europe. *Social Indicators Research* **99**, 205–225.

Dubois H, Runceanu G and Anderson R (2016) *Extending Working Lives Through Flexible Retirement Schemes: Partial Retirement*. Luxembourg, Publications Office of the European Union, Ref. n°EF1629:88.

Fisher GG, Chaffee DS and Sonnega A (2016) Retirement timing: a review and recommendations for future research. *Work, Aging and Retirement* **2**, 230–261.

Graetz B (1993) Health consequences of employment and unemployment: longitudinal evidence for young men and women. *Social Science & Medicine* **36**, 715–724.

Hayes T, Usami S, Jacobucci R and McArdle JJ (2015) Using Classification and Regression Trees (CART) and random forests to analyze attrition: results from two simulations. *Psychology and Aging* **30**, 911–929.

Howel D (2012) Interpreting and evaluating the CASP-19 quality of life measure in older people. *Age and Ageing* **41**, 612–617.

Idler EL and Benyamini Y (1997) Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior* **38**, 21–37.

Jousten A, Lefèbvre M, Perelman S and Pestieau P (2010) The effects of early retirement on youth unemployment: the case of Belgium. In Gruber J and Wise DA (eds), *Social Security Programs and*

Retirement Around the World: The Relationship to Youth Employment. Chicago, IL: University of Chicago Press, pp. 47–76.

Kober R and Eggleton IRC (2005) The effect of different types of employment on quality of life. *Journal of Intellectual Disability Research* **49**, 756–760.

Lewis S, Anderson D, Lyonette C, Payne N and Wood S (2017) Public sector austerity cuts in Britain and the changing discourse of work–life balance. *Work, Employment and Society* **31**, 586–604.

Maddox GL and Douglass EB (1973) Self-assessment of health: a longitudinal study of elderly subjects. *Journal of Health and Social Behavior* **14**, 87–93.

Palier B (2002) De la crise aux réformes de l'État-providence: le cas français en perspective comparée. *Revue française de sociologie* **43**, 243–275.

Platts LG, Netuveli G, Webb E, Zins M, Goldberg M, Blane D and Wahrendorf M (2013) Physical occupational exposures during working life and quality of life after labour market exit: results from the GAZEL study. *Aging & Mental Health* **7863**, 37–41.

Prince MJ, Reischies F, Beekman AT, Fuhrer R, Jonker C, Kivela SL, Lawlor BA, Lobo A, Magnusson H, Fichter M, van Oyen H, Roelands M, Skoog I, Turrina C and Copeland JR (1999) Development of the EURO-D scale. A European-Union initiative to compare symptoms of depression in 14 European centres. *British Journal of Psychiatry* **174**, 330–338.

Rice NE, Lang IA, Henley W and Melzer D (2011) Common health predictors of early retirement: findings from the English Longitudinal Study of Ageing. *Age and Ageing* **40**, 54–61.

Salais R (2004) La politique des indicateurs. Du taux de chômage au taux d'emploi dans la stratégie européenne pour l'emploi (SEE). In Zimmermann B (ed.), *Les sciences sociales à l'épreuve de l'action. Le savant, le politique et l'Europe*. Paris: Maison des Sciences de l'Homme, pp. 1–28.

Siegrist J, Wahrendorf M, Von Dem Knesebeck O, Jürges H and Börsch-Supan A (2007) Quality of work, well-being, and intended early retirement of older employees – baseline results from the SHARE Study. *European Journal of Public Health* **17**, 62–68.

Sorée A (2015) 27.000 prépensionnés vont devoir retourner sur le marché du travail. *L'écho*.

Tang F and Ishwaran H (2017) Random forest missing data algorithms. *Statistical Analysis and Data Mining* **10**, 363–377.

Verbakel E and Diprete T (2007) Non-working time, income inequality, and quality of life comparisons. The Case of the U.S. vs. the Netherlands. Institute for Social and Economic Research and Policy, New York, NY, ISERP Working Paper 07-16.

Waddell G and Burton AK (2006) *Is Work Good for Your Health and Well-Being?*. UK: The Stationery Office, 257.

Wels J (2014) Le partage d'emploi entre générations. Analyse des effets régulateurs et redistributifs de la réduction du temps de travail en fin de carrière sur l'emploi des jeunes. *Recherches Sociologiques et Anthropologiques* **45**, 157–174.

Wels J (2016) The statistical analysis of end of working life: methodological and sociological issues raised by the average effective age of retirement. *Social Indicators Research* **129**, 291–315.

Wels J (2018) Are there health benefits of being unionized in late career? A longitudinal approach using HRS. *American Journal of Industrial Medicine* **61**, 751–761.

Wels J (in press) Assessing the association between late career working time reduction and retirement plans. A cross-national comparison using the 2012 Labour Force Survey ad hoc module. *Social Policy and Society*.

Wheatley D (2017) Employee satisfaction and use of flexible working arrangements. *Work, Employment & Society* **31**, 19.

Winship C and Mare RD (1984) Regression models with ordinal variables. *American Sociological Review* **49**, 512.

Yamada T, Chen C-C, Naddeo JJ and Harris JR (2015) Changing healthcare policies: implications for income, education, and health disparity. *Frontiers in Public Health* **3**, August, 3–6.

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