ACTIVE AGEING IN EUROPE: AN ANALYSIS OF THE ASSOCIATION BETWEEN LABOUR FORCE PARTICIPATION AND HEALTH

By

María Teresa Márquez López

A thesis submitted in conformity with the requirements
for the MSc in Economics, Finance and Computer Science

University of Huelva & International University of Andalusia

July 2020

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Universidad Internacional de Andalucía

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María Teresa Márquez López

MSc in Economics, Finance and Computer Science

Tutor: Concepción Román Díaz

University of Huelva & International University of Andalusia

Abstract

The concept of *active ageing* arises in response to the challenges posed by the demographic changes that Europe faces. Thus, economic policy has included this concept in its strategy to extend the quality of life of the older people without compromising public finances. The main aim of this work is to analyse the association between two dimensions of this phenomenon: the labour participation of the older people and their impact on health. To this end, we use microdata from the *Survey on Health, Ageing and Retirement in Europe* for the period 2004-2017. Our main results highlight the importance of people older than 50 remaining active to enjoy better health levels

Keywords: active ageing, health, labour participation, self-employment, paid employment, public policy, Europe.

Resumen

El concepto *envejecimiento activo* surge como respuesta a los desafíos planteados por los cambios demográficos a los que se enfrenta Europa. Así, la política económica ha incluido este concepto en su estrategia para extender la calidad de vida de los mayores sin comprometer las finanzas públicas. El objetivo de este trabajo es analizar la asociación existente entre dos dimensiones de este fenómeno: la participación laboral de los mayores y su impacto en la salud. Para ello, hacemos uso de los microdatos de la *Encuesta sobre Salud, Envejecimiento y Jubilación en Europa* correspondientes al periodo comprendido entre 2004 y 2017. Nuestros principales resultados ponen de manifiesto la importancia de mantenerse activo laboralmente una vez superados los 50 años para disfrutar de mejores niveles de salud.

Palabras-Clave: envejecimiento activo, salud, participación laboral, autoempleo, trabajo asalariado, políticas públicas, Europa.

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1. INTRODUCTION

Population ageing is one of the biggest social and economic challenges that European Union (EU henceforth) is facing in the 21st Century (Eurostat, 2019). It is having important consequences on different aspect of the society and economy, including housing, healthcare and social protection, labour markets, the demand for goods and services, macroeconomic and fiscal sustainability, family structures and intergenerational links (United Nations, 2015).

According to the latest statistics released by Eurostat, low birth rates and a higher life expectancy are modifying the EU-28's age pyramid's shape. The most important change will be the big transition towards a much older population structure in the EU Member States (Eurostat, 2019).

As a result, the proportion of the population over 65 years will almost double in number, and the number of people aged 80 years or above in the EU-28's population will increase from 5.6 % to 14.6 %, between 2018 and 2100. Al the same time, people of working age in the EU-28 is decreasing, while the number of retired people is increasing. As a consequence, during the period from 2018 to 2100 the old-age dependency ratio is projected to increase from 30.5% to 57.3% (Eurostat, 2019).

In short, the number of older people related to the total population will raise in the next decades, when a proportion of the post-war baby-boom generation achieves the retirement age. All this facts will give rise to an increased charge on those of working age to face social expenditure required by the ageing population (Eurostat, 2019). On the one hand, public pension costs in the EU is projected to increase in 0.4 percentage points of GDP during the period of 2013-2040, reaching a 11.7% of GDP. However, there will be different changes among the Member States (European Commission, 2015a). On the other hand, ageing of population involves important changes in family structures and an imbalance between younger and older populations (European Commission, 2015a). Thus, it is important to guarantee intergenerational solidarity systems (United Nations, 2007), since nowadays retired public pensions are paid with the contributions of social workers (Patel & Gray, 2006). This fact implies that a low number of workers had to pay a bigger number of retired people.

However, ageing should not be considered a factor which avoids growth, but a potential growth resource (European Commission, 2019). Due to the knowledge of these changes, it is possible to act in advance (United Nations, 2007) and implement effective public policies to make people remain healthy and active in their working life and ageing (Nilsson, 2016).

In this context, active ageing surges as a concept whose main priority is to guarantee older people's rights to stay healthy (reducing health and social care's costs), work much longer (shrinking pension costs), and participate in political and community activities at the same time (Foster & Walker, 2014).

Concretely, in response to population demographic ageing, and its social, economic and political consequences, European governments will be aimed at increasing labour market participation of older people and retirement age (over 65 years). In fact, some Member States have already increased retirement age (for example, Ireland to 68 years by 2028; and Germany to 67 years by 2031), and they have implanted ways to let workers remain in their jobs longer (Eurofound, 2020). Nevertheless, although older people stay economically active or healthy, the fact of finding an adequate employment can be difficult (United Nations, 2007). Thus, societies, organizations and companies should comprehend and take care of older workers in their working life (Nilsson, 2016).

In this sense, self-employment is becoming a viable option to face the enlargement of retirement age, both at the level of the individual and at the macro-policy level (Lewis & Walker, 2014). Thus, governments can promote self-employment as a choice to early retirement to reduce the economic impact of ageing. The success of these measures will depend on the positive way in which self- employment affects health (Rietveld et al., 2015).

Taking into consideration all the previous facts, the main aim of this paper is to contribute to the analysis on the relationship between older people employment situation and their health, with a special emphasis on the differences between paid and self-employment. To this end, we use micro data of the seven regular waves (from 2004 to 2017) of the Survey of Health, Ageing and Retirement in Europe (SHARE).

Our main results show the importance of being active once workers are over 50 years to enjoy the best mental and physical health levels. In addition, our empirical analysis also highlights differences between different types of employment, emphasizing the role of self-employment as physical health enhancer. These results have implications for a better design of policies that try to respond to the ageing of the population by lengthening the working life of workers.

This paper is organized in six sections, of which the first one is this introduction. The second section analyses demographic ageing challenges, active ageing in Europe, and the different European policies which are about active ageing. The third section shows the related literature about labour participation and health. The fourth section presents the data and the methodology, whereas the fifth discusses the estimated results. Finally, the sixth section concludes with the implications of the analysis.

2. BACKGROUND

2.1. DEMOGRAPHIC AGEING: CHALLENGES

The biggest challenge related to ageing is to know how to take advantage of all people potential, including those at an older age. Particularly, demographic and social changes in industrialized countries create challenges for ageing policies in four dimensions (Walker, 2002).

Firstly, ageing is a source of pressure on pensions systems. Pensions' sustainability affects all generations, not just older people who receive them. The EU Member States have some of the most comprehensive and generous public pension systems in the world (European Commission, 2012a), but the rising life expectancy and a fixed retirement age imply an increase of the pensions cost. This fact raises the question of how to ensure Europe's pensions remain adequate, safe and sustainable.

This situation has worsened in the last few years due to the economic and financial crisis - a low economic growth, budget deficit, public debt, financial instability and a low employment rate - (European Commission, 2017). Public pensions sustainability

depends crucially on contributions, taxes and savings of today's active workers (European Commission, 2019).

In this way, it is necessary to modify long term pension systems to ensure an adequate income in retirement. If these public costs keep on increasing, the future well-being of retired people and employees will be affected. Definitely, it is important to act now to make all generations, including baby-boomers, contribute to the adjustment process (European Commission, 2006).

Secondly, it is necessary as well to raise employment to achieve a higher economic growth and a better productivity (European Commission, 2012a). Over the future years, Europe should not lose the employment potential of the only population group which can grow in size: the over 50s. An important issue is to make older workers stay in productive employments to generate economic growth and employment opportunities (European Commission, 2012a).

Thus, ageing of the workforce implies new challenges such as age management, lifelong education and continuous training; these new challenges will modify old policies which provoked an early exit of the labour market to upgrade employment and productivity (Walker, 1997)

Thirdly, population ageing implies a challenge for European public health and long-term-care systems. On the one hand, these systems have let to reduce old-age mortality during the 21st century (Rechel et al., 2013). However, the financial sustainability of these systems is in danger (European Commission, 2012b). In the EU, it is expected an increase in old-age social policy expenditure of 1.7 pps. of GDP from 2016 to 2070 (European Commission, 2018).

In this context, it is necessary to upgrade support and social assistance, adapt health services and prevent chronic diseases, since health is an important factor in the improvement of older people's capacity in work environment (Forma et al., 2005). Smoking, obesity and alcohol prevention will be necessary to achieve the previous statement, as well as the avoidance of a sedentary lifestyle, poor diets, and in general, poor living conditions (Doyle et al., 2012). In short, a change in healthcare systems from curative to preventive model, and in social care systems from supporting

dependency to promoting rehabilitation and an independent living, should be achieved in order to get all the previous goals (Walker, 2002).

Fourthly, the increase of older people in number, and the risks of exclusion of these people imply that governments have to create a common citizenship, regardless of age, genre, race, education, health state, income and other resources.

An older workforce and a longer working life should not imply less productivity. However, in most European countries, older workers have a negative status in the labour market. They are discriminated with respect to labour recruitment and represent a little proportion of long-term employees (Phillipson & Smith, 2006).

The main reason for that is the existence of a stereotype that older workers have a lower job performance than younger workers. There are a variety of explanations to clarify this stereotype; for example, it is thought that older workers have less mental and physical ability, cannot handle stress or are less competent; and as a consequence, their job performance is reduced. On the other hand, some employers think that older workers cannot learn new concepts easily (Posthuma & Campion, 2009).

In this context, despite the necessity of increasing retirement age and reducing pension costs, governments should consider that these measures can contribute to a bigger discrimination and exclusion of older workers (Walker & Maltby, 2012). Thus, public policies will need to avoid such social exclusion in the advanced age (Walker, 2002).

In conclusion, an ageing population should not be a problem for society. Furthermore, it can be an incentive to create new working conditions, as well as new products and services. The fact of older people staying longer in their work position will help Europe to face demographic revolution in the next decades with an economic in expansion, safe and sustainable pensions and extended long-term care and health services (European Commission 2012a). In response to these political challenges, governments have proposed an active ageing strategy which will be explained in the following.

2.2. ACTIVE AGEING: CONCEPT

In the last few decades, the concept of active ageing has been used in Europe as the main political response to the problems related to ageing of the population (European Commission, 2012b). This concept surged in the United States in 1960, and in Europe in the 1990s. It was adopted in order to amplify the term of healthy ageing and consider other important factors which affect population ageing, apart from health care (Kalachea & Kickbusch, 1997). In this way, active ageing established a relationship between activity and health, and the importance of healthy ageing (World Health Organization -WHO-, 1994).

The most widely used definition is the one stated by the WHO which defines active ageing as "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age" (WHO, 2002).

Nowadays, three important pillars of active ageing are distinguished: participation, health and security. At the same time, the concept *active* is a relevant term which should be taken into account. It is referred to a continued participation in economic, cultural, spiritual and civic areas, as well as the active role which is played by the retired people and the ones who are ill or disabled (WHO, 2002).

These ideas changed the ageing concept which was characterised by passivity and dependency. Nowadays, ageing is associated with greater autonomy and participation of older people (Townsend, 2007).

On the other hand, it is necessary that active ageing has the objective of improving well-being through measures which eliminate age discrimination in the workplace, and emphasize flexible ways of employment and training opportunities (Corsi & Samek, 2010). Definitely, alternative lifestyles and different concepts and ways of employment are necessary.

However, despite these approaches stated by the United Nations and the WHO, active ageing policies have a productive perspective whose main objective is to extend working life. As a consequence, people, who do not have a paid employment, are not included in active ageing; and it can be observed how their contributions to society are in danger of being omitted (Boudiny, 2013).

Regarding the previous idea, the EU is taking action in lifelong learning, flexible working arrangements and being active after retirement; nevertheless, its main goal is to extend older people working life to improve economic growth (Hamblin, 2010).

In short, it is fundamental to address these kinds of problems (such as age discrimination in the workplace or inflexible working conditions) to achieve an integral approach of active ageing with better employment conditions and opportunities for the huge number of older people that is continuously growing.

2.3. ACTIVE AGEING IN EUROPE

Nowadays, facing active ageing through adequate policies is still a huge challenge. As a consequence, an *Active Ageing Index* (AAI) has been created to help policymakers to design new strategies based on quantitative, comparative, and substantive evidence of indicators and indexes of active ageing for EU Member States, and in this way to promote an active and healthy ageing for citizens.

Fort the first time, during *The European year for Active Ageing and Solidarity between generations 2012*, the AAI managed to put into practice the multidimensional concept of active ageing, since till this moment this concept has only been considered theoretically (European Commission, 2007a). The development of this index was a common project realised by *The United Nations Economic Commission For Europe* and *The European Commission's Directorate-General for Employment Social Affairs and Equal Opportunities*. This project pretended to compare active ageing levels between European countries and identify strengths and weaknesses of each country.

In detail, the objective of this tool is "to measure the untapped potential of older people for active and healthy ageing across countries. It measures the level to which older people live independent lives, participate in paid employment and social activities, and their capacity to age actively" (UNECE/European Commission, 2015).

AAI consists of 22 indicators which are grouped into four dimensions: employment, social participation, independent, healthy and secure living, and a capacity and enabling environment for an active ageing. The first three dimensions are referred to active

ageing real experiences and are linked to the main principles of The European year for Active Ageing and Solidarity between generations 2012, while the fourth one makes reference to the capacity and environmental conditions which are necessary for an active and healthy ageing. This dimension measures health and human capital. Figure 2.1 shows index composition.

AAI 22 indicators 4 domains	Active Ageing Index			
	Employment domain	**Social participation domain**	**Independent, healthy and secure living domain**	**Capacity and enabling environment for an active ageing domain**
	Employment Rate 55-59	Voluntary activities	Physical exercise	Remaining life expectancy at age 55
	Employment Rate 60-64	Care to children and grandchildren	Access to health services	Share of healthy life expectancy at age 55
	Employment Rate 65-69	Care to infirm and disabled	Independent living	Mental well-being
	Employment Rate 70-74	Political participation	Financial security (3 indicators)	Use of ICT
			Physical safety	Social connectedness
			Lifelong learning	Educational attainment
	Actual experiences of active ageing			Capacity of actively age

Fig. 2.1. Active Ageing Index – Indicators and domains.

Source: Own elaboration based on data provided by UNECE

In relation with the advantages that the index has for every country, this tool allows us to determine in which way countries are using the untapped potential of the ageing population. In addition, this tool offers a method to assess modifications or improvements in the policies. Thus, politicians will identify that their programmes and policies are inefficient when index values are lower. In this sense, the general objective is to identify individual and common policies between the EU countries to take advantage of older people potential (UNECE/ European Commission, 2015).

Related to the index interpretation, its value can range from 0 to 100. Higher values imply a bigger participation of older people in society, and better life conditions. Theoretically, it is possible to achieve a value equal to 100, although this does not occur

in practice because this will mean the full participation of the population in different society aspects (Zaidi et al., 2013).

Figure 2.2 shows the AAI in 2018 for EU-28 countries. It can be observed how Sweden occupies first place of the EU-28 ranking with a value of 47 points. After Sweden, we can find countries such as Denmark, Netherlands, United Kingdom and Finland with higher values over 40 points.

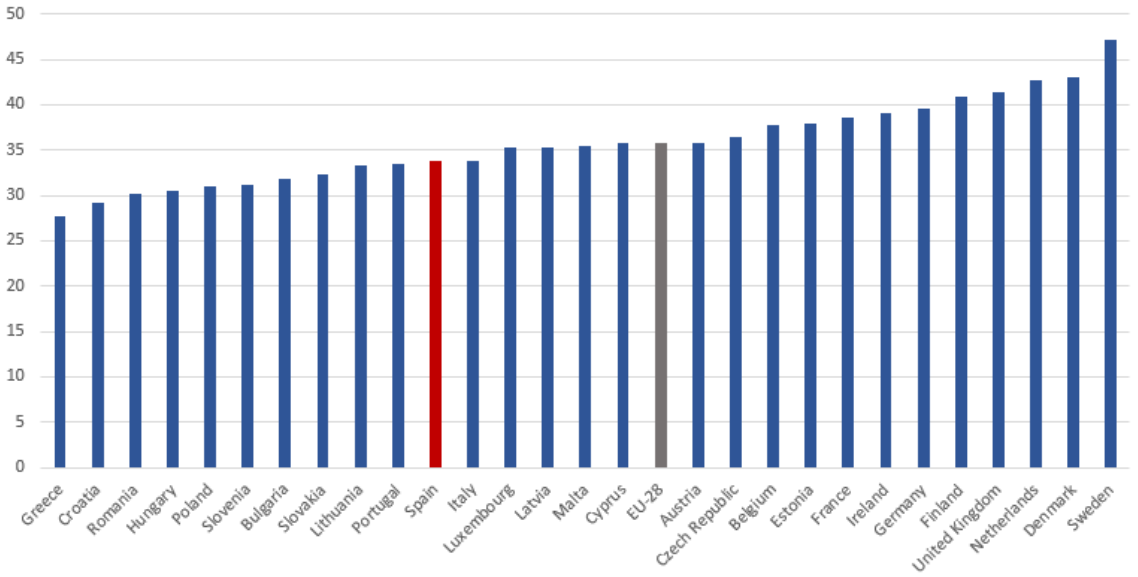

Fig. 2.2. Active Ageing Index – 2018 – EU-28.

Source: Own elaboration based on data provided by UNECE

At the other end of the ranking, we can see how Greece and Croatia have values under 30 points. Therefore, these countries have a clear margin of improvement and should realise bigger political strengths.

Spain is next to other European southern countries as Italy and Portugal with values below EU-28 average with an index of 33.7 points. In this way, our country has only 6 points more than Greece (the country with the worst punctuation) and 13.5 points less than Sweden (the country with the best punctuation).

Considering separately the four domains of the index, we can observe in figures 2.3 to 2.6 that Spain is below EU-28 average for the *employment* domain (Figure 2.3) and for

the *social participation* one (Figure 2.4). On the other hand, Spain is above EU-28 average for the *independent, healthy and secure living* domain (Figure 2.5), and for the *capacity and enabling environment for an active ageing* one (Figure 2.6). Particularly, the weakest position in Spain is referred to the *employment* domain, since it has one of the lowest positions in the ranking with an employment rate for people over 65 years which barely exceeds 25%.

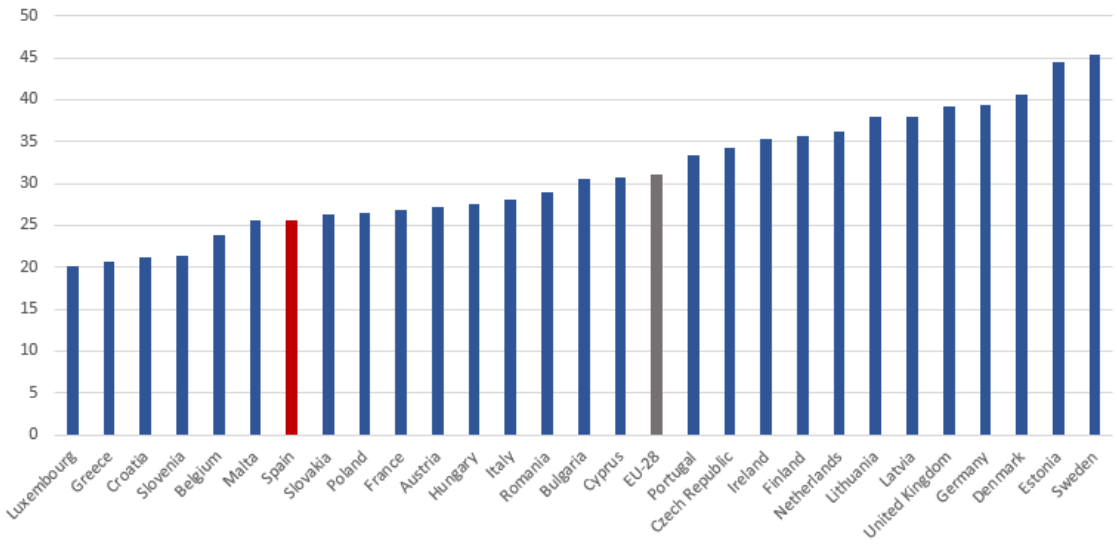

Fig. 2.3. *Employment* domain – 2018 – EU-28.

Source: Own elaboration based on data provided by UNECE

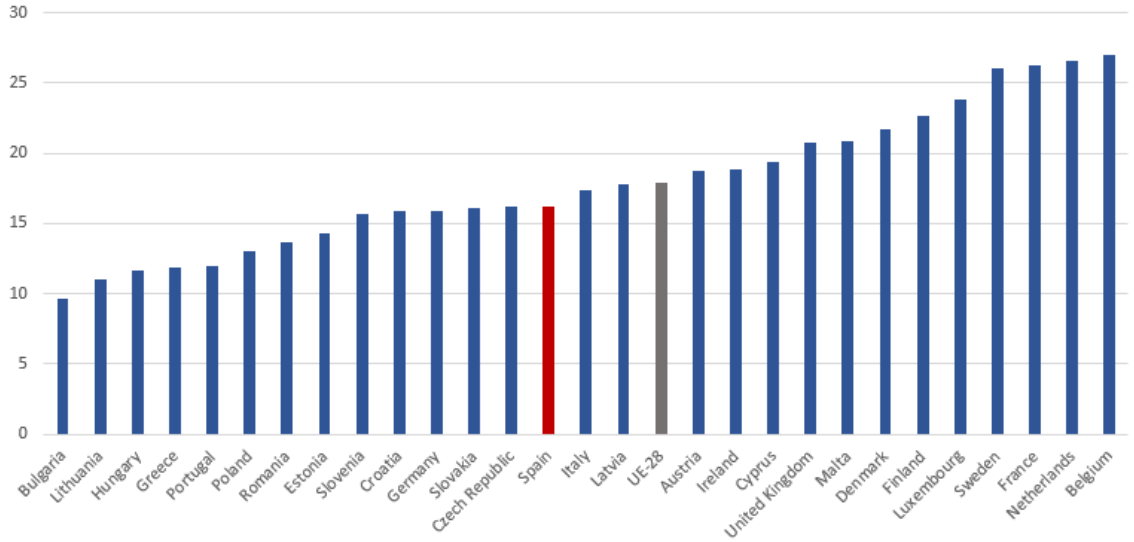

Fig. 2.4. *Social participation* domain – 2018 – UE -28

Source: Own elaboration based on data provided by UNECE

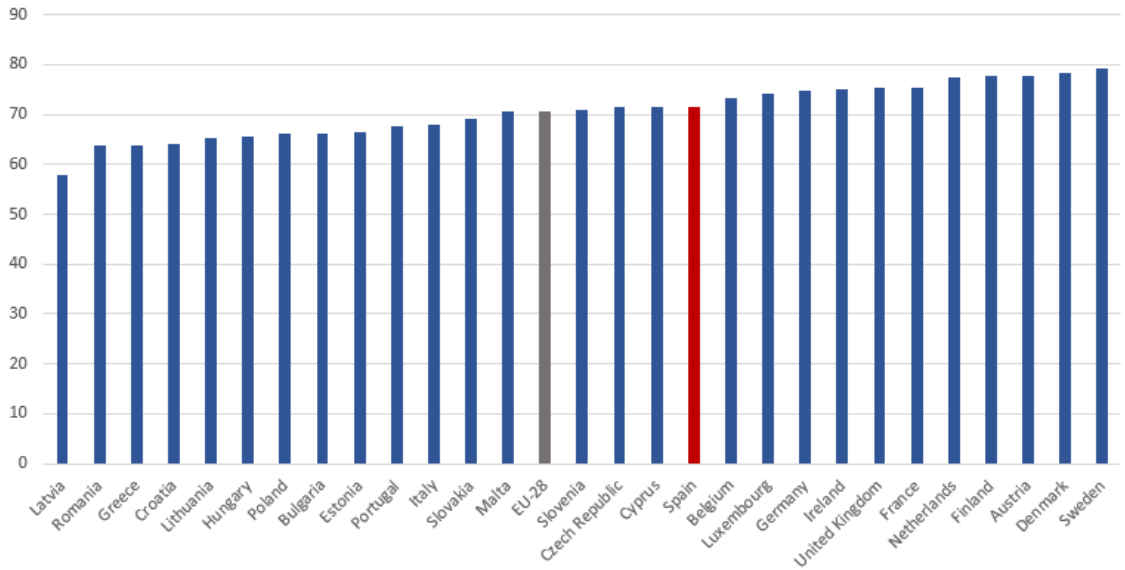

Fig. 2.5. *Independent, healthy and secure living* domain – 2018 – UE -28

Source: Own elaboration based on data provided by UNECE

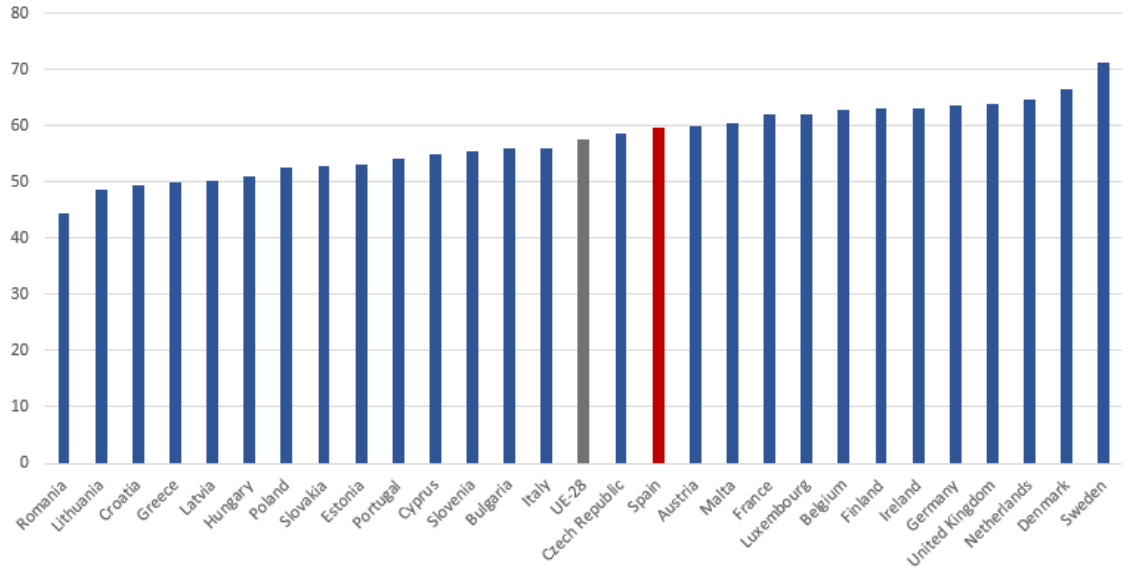

Fig. 2.6. *Capacity and enabling environment for an active ageing domain* – 2018 – UE-28

Source: Own elaboration based on data provided by UNECE

Precisely, if we focus on the differences of the *employment* domain, it is important to highlight Sweden, Estonia and Denmark with values over 40%. By contrast, Luxembourg, Greece, Croatia, Slovenia and Belgium are the countries with the biggest potential for improving older people employment. Malta, Spain, Slovakia, Poland and France are the countries which have a similar margin of improvement with values around 25%.

The empirical research of this paper focuses on analysing the association between labour participation and older people health in Europe, what is directly related to the *employment* domain.

2.4. EUROPEAN POLICY ABOUT ACTIVE AGEING

Population ageing is a recent European political issue. European countries started to formulate active ageing policies at the end of the 20th century. Until this moment, older people were seen as simple passive recipients of pensions (Walker & Maltby, 2012). However, the active ageing approach has changed this negative conception and has solved some of the problems connected to ageing.

The Member States are responsible for employment and social protection policies, for defining common objectives and a mutual learning process. Concretely, this common framework covers pensions, health and long-term care, and social exclusion; and provides common indicators to measure progress and identify efficient practices (European Commission, 2012a).

In the following we present some relevant policies associated with the four population ageing challenges previously explained in section 2.1.

2.4.1. An adequate and sustainable pension systems design

As it is previously stated, public pension systems have to face demographic changes and their sustainability is in danger. This is the main threat related to fast population ageing (Tempest et al., 2002).

The main measures to get adequate and sustainable pension systems in Europe are included in the White Paper, *An Agenda for Adequate, Safe and Sustainable Pensions* (European Commission, 2012c). This report establishes as important measures the following ones: (I) guaranteeing financial sustainability in pension systems which is at risk due to the bad economic situation, (II) maintaining the adequacy of pensions since they are a considerable income source for most of the European population, (III) improving older people and women participation in the labour market to work against the negative effects of the pension costs increase.

Related to the pension systems sustainability, the 2019 Ageing Report has stated that expenditure on pensions is expected to rise in both absolute terms and as a share of GDP (Eurostat, 2019).

On the other hand, the *2018 Pension Adequacy Report* establishes that the adequacy level of pensions has not been the same for all regions and population groups. Concretely, women have a higher possibility of having inadequate pensions. In most EU countries, women pensions are much lower if we compare them with the men ones; and in addition, one of every five women over 65 years is at risk of social exclusion and

poverty. Nowadays, the gender gap in pensions is 37.2 % in the EU (European Commission, 2018).

This fact reflects differences that exist between women and men related to working hours, salary and career duration (European Commission, 2015b). Thus, it is necessary to design policies in charge of the improvement of the women situation in the labour market (European Commission, 2012a).

Furthermore, in 2016, the European Commission compiled *The Pension Reforms in the EU since the Early 2000's: Achievements and Challenges Ahead report* which resumes the Member States measures to achieve more sustainable pensions (Carone et al., 2016).

Regarding this report, the principal measure adopted in the EU has been the enlargement of the retirement age. In fact, almost all European countries have raised early and statutory retirement age, except Luxembourg. In particular, countries such as Greece, Sweden, France and Finland have experimented huge increases of these ages from 2008 to 2013 (European Commission, 2016a).

2.4.2. Labour-force participation increase

The Europe 2020 Strategy (adopted by the EU in 2010) pursues the goal of increasing the employment rate and the productivity in Europe. One of the main parameters is to ensure the employment for 75% of the people aged 20 to 64 by 2020. This can be achieved if a bigger number of older people remain in their jobs longer (European Commission, 2012a).

The EU uses the employment rate as the main indicator to measure its employment objective. According to the statistics released by Eurostat, the number of employees from 2017 to 2018 increased in 2.3 million (1% more than in 2017).

Furthermore, the EU has imposed national targets in order to measure different circumstances of each country. In 2018, Greece and Spain were the countries which obtained the worst results since they had not achieved their national targets (Eurostat, 2020).

The main measures to achieve this labour-force participation increase are lifelong-learning education and flexible working conditions.

2.4.2.1. Lifelong Education

Learning and training are important factors for an ageing population because they help people to remain in their employments longer, have a bigger physical and mental capacity, and wellbeing. In this way, the EU objective is to give to all population groups education and training in order to boost the participation in the labour market and proportionate a quality job. In addition, training and education will let older people to improve the transition from work to retirement and their life standards.

The EU provides the necessary tools to guarantee the population employability in all Member States which are responsible for their own education and training systems. Thus, the strategic framework for *European cooperation in education and training* (ET 2020) was created. This tool lets the mutual learning exercises and studies exchange, best practices in education policy, and data collections (European Commission, 2014a). One of the indications of this strategy was to improve the lifelong learning participation of people aged 25 to 64 to more than 15% by 2020 (European Commission, 2012a).

In particular, this strategy includes *the Agenda for new skills and jobs* which pretends to develop policies to improve the transition from inactivity into employment, and the older workers qualifications.

Furthermore, the EU has developed the *Erasmus for all* programme (2014- 2020) which faces the most important educational and training challenges in Europe, it includes adult education strategies too.

2.4.2.2. Flexible working conditions

Member States pursue careers and working conditions adaptation to older workers actual necessities, because it will avoid early retirement (European Commission, 2012a). One of the fundamental factors to expand older people's work life is the working hours modification, for example, part-time work contributes to the upgrade of the work-life balance, and to the increase of the older workers employment rate, especially among women (Leber & Wagner, 2007).

The EU provides a legal framework related to the working day which is established in the Directive (EU) 2003/88/CE. It states minimum health and safe requirements in work, such as holidays, work shifts, and extra hours. All Member States have to incorporate these measures to the national legislation with a certain level of autonomy.

On the other hand, the Directive (EU) 97/81/CE has the objective of improving the part-time workers situation. All EU countries should facilitate the access to this type of jobs to achieve a bigger professional and family life reconciliation (Plantenga & Remery, 2009). For example, in Austria exists a partial old age part-time scheme which lets older workers to reduce their working hours without giving away any of their pension entitlements, unemployment or health insurance (Foster & Walker, 2013).

Furthermore, *The European Foundation for the Improvement of Living and Working Conditions* (Eurofond) provides information, advice and experience to support active ageing, in particular, measures to modify the working environment, maintain older workers in their jobs longer, and increase their participation in the labour market when they are over retirement age.

2.4.3. Health care

There is a broadly-based perception that age is associated with a poor health, what produces important differences related to older workers productivity, as well as an early exit from the labour market (Walker & Maltby, 2012). As a consequence, it is necessary to develop measures to improve population health and prevent diseases related to age (Rechel et al., 2009).

The most effective way to promote a healthy ageing is to manage policies to young and middle-aged adults. In this way, people could reach the retirement age with a good health level. In addition, preventive strategies will be the most efficient and adequate (Ilmarinen, 2005).

Member States have the responsibility to define their health policies, but the EU can contribute to the knowledge development to face public health problems and prevent diseases. In addition, the EU establishes key priorities in public health, and long-term

common objectives to promote an active and healthy ageing (European Commission, 2012b).

The European Commission has created Health Security Committees and expert groups to improve exchange and learning among national, local and regional governments. These committees' study important issues related to healthy ageing (as smoking, obesity, excessive alcohol consume and cancer), and cooperative mechanisms about nutrition, physical activity, security and health information.

On the other hand, in 2014 *The* European Commission created a new programme called *Health for Growth* (2014-2020) which pursues the European Strategy 2020 objectives. This programme emphasizes the relation between health and economic prosperity, since population health has a direct influence on productivity, job offer and labour force (European Commission, 2014b).

Furthermore, in *The EU Strategic Framework on Health and Safety at Work* (2014-2020), the EU has established the importance of managing ageing of the EU's workforce, and of the new emerging challenges.

2.4.4. Developing inclusive and non- discriminatory societies

Nowadays, discrimination against older workers is other of the principal issues of the European political agenda. *The Age Barriers Project* (1994) was the first European investigation which was focused on good practices, such as the recruitment and training of ageing workers. It performed initiatives to achieve older workers retention, reintegration and retraining, which were adopted by seven Member States: Belgium, France, Germany, Greece, Italy, the Netherlands and the UK (Walker, 1999).

Ever since, European policymakers are still applicating measures to eliminate age discrimination and achieve active ageing policies. In particular, *The Employment Equality Directive* (2000/78/CE) states equal treatment and employment formation, regardless of religion, disability, sexual orientation or age (European Commission. 2012b).

Furthermore, the European Commission has financed a European campaign called "For Diversity Against Discrimination" since 2003; its aim is to publish videos, images and documents to eliminate negative stereotypes related to age discrimination, and improve the current legislation in this field. It also supports, in the European area, *The EU Platform of Diversity Charters* which incentives companies to achieve voluntarily compromises connected with diversity.

In spite of these policies, age discrimination is still one of the fundamental barriers for older people in the European labour market, and in the whole society. It is necessary an integral policy which takes into account all the working life, preventive measures (education ad lifelong learning) and corrective ones (older workers training for those people who do not have specific abilities, for example, in new technologies) (Posthuma & Campion, 2009). Probably, active ageing policies will not succeed without these measures against age discrimination (Walter & Maltby, 2012).

3. LABOUR PARTICIPATION AND HEALTH: RELATED LITERATURE.

As it has been previously stated, health is a key factor to guarantee older people participation in the labour market, and a long working life. Public health and wellbeing advances are giving new opportunities to older people to get an employment. However, some experts consider that there is still an unused capacity for active work at older ages (Gruber & Wise, 2004; Kalwii & Vermeulen, 2008). On the other hand, job position characteristics can have an influence on health levels (Ravesteijn et al., 2013). In this way, participation in social and productive activities has been always considered important for older people health and wellbeing.

Under these circumstances, it is necessary to analyse what type of occupations can be beneficial to take advantage of the older people unused work capacity with good health conditions. Particularly, there are studies which compare paid work with self-employment one (Parslow et al., 2004; Dahl et al., 2010; Yoon & Bernell, 2013).

First of all, we refer to the employment demand-control model to comprehend the self-employment effect in workers' health (Theorell & Karasek, 1996). This model links employment control (which is associated with decision-making power in professional activities) and labour demand (intensity and workload perception) with people characteristics. These two concepts can determinate workers stress level, as well as their physical health (Stephan & Roesler, 2010).

In this sense, self-employed workers, in comparison with employees, have higher job control levels and a bigger independency in professional activities development. However, self-employment also has some disadvantages because self-employed individuals experiment a higher workload (Stephan & Roesler, 2010).

For example, comparing them to employees, self-employed workers are used to work more hours a day, and more days a week, have to solve difficult problems related to work, and put their income, goods and financial assets in risk (Dolinsky & Caputo, 2003). On the other hand, employees are not totally responsible for the business survival (Bjuggren et al., 2012). Definitely, financial, physical and mental stress factors among self-employed workers can imply bigger physical and mental problems (van der Hulst, 2003).

By contrast, there is also evidence that support that self-employed workers have better health levels than employees (Rietveld et al., 2015). Thus, self-employment is associated not only with a better economic situation (Koellinger & Thurik, 2012), and physical vitality (Stephan & Roesler, 2010), but also with higher levels of job and leisure satisfaction and wellbeing (Abreu et al., 2018).

Self-employment also indicates a bigger autonomy and schedule flexibility, which can imply different health levels compared to employees. Theoretically, self-employees can have better health due to the positive association between health and life satisfaction (Binder & Coad, 2013).

In this way, job satisfaction is a key factor for individual wellbeing, and affects workers productivity, retirement decisions, and economic prosperity (Faragher et al., 2005). Furthermore, any factor which raises job satisfaction (for example, better working

conditions) would be beneficial for health perception and health state (Fischer & Sousa-Poza, 2009).

Moreover, self-employment is a good option for older people since their professional and social abilities, and knowledge constitute an important human resource capital. This social and human capital proportionates a more competitive position to older people in comparison to younger one (de Bruin & Firkin, 2001).

Finally, the positive relationship between self-employment and health can be conditioned by a selection effect, which implies a self-selection of healthy individuals into self-employment. In this case, good health indicators will not be influenced by self-employed work characteristics (Rietveld et al., 2015).

In short, the relation between labour participation and health is complex. There are opposed factors which imply better health conditions in self-employment work (bigger autonomy, flexibility, job satisfaction, etc,), as well as in paid work (more reduced workdays, less responsibility, etc.). We should not forget either the possible selection effect of healthy individuals into self-employment.

Considering the previous view, it will be presented in the following section our empirical analysis which contributes to the study of the association between health and labour participation highlighting differences between employees and self-employed workers.

4. METHODOLOGY

4.1. DATA AND SAMPLE

In this paper, we use microdata of the *Survey of Health, Ageing and Retirement in Europe* (SHARE). It is a multidisciplinary and cross-national panel database of microdata on health, socio-economic status and social and family networks. SHARE includes approximately 140,000 individuals aged 50 and over in different European

countries. It is an interdisciplinary and international project developed by the European Commission in order to promote European ageing investigation.[1]

The application of common procedures and protocols guarantees data harmonization among all the participant countries. Also, this survey is harmonized with the *Health and Retirement Study* (HRS) of the United States, and with the *English Longitudinal Study of Ageing* (ELSA) of the UK. On the other hand, new investigations, based on the SHARE model, are been carried out in Japan, Korea, China and India.

The first SHARE wave took place from 2004 to 2005, and involved eleven European countries; from Scandinavia (Denmark and Sweden) to Central Europe (Austria, France, Germany, Switzerland, Belgium and the Netherlands) and the Mediterranean (Spain, Italy and Greece). After this, more countries have been added to the following waves which have been made every two years until achieving 27 European countries and Israel in total.[2]

Particularly, our analysis uses microdata of the seven regular waves (from 2004 to 2017). The longitudinal design of the survey lets us to analyse the dynamic dimension of the ageing process.

The selected sample includes men and women aged between 50 and 69 in the participant countries. After sample filtering (excluding people who do not answer some relevant questions for our analysis), and depending on the estimation which has been made, our final sample has around 160,000 observations.

4.2. VARIABLES[3]

4.2.1 Dependent variables.

[1] More detailed information about the project can be obtained at www.share-project.org

[2] Currently, this is the complete list of countries included in the survey: Austria, Belgium, Bulgaria Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Finland, Germany, Greece, Hungary, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland.

[3] A detailed description of all variables included in the analysis can be found in the Appendix (Table A.1)

Health level is a difficult concept to measure using surveys (Coe & Zamarro, 2011). On one hand, self- perceived health indicators can present problems related to justification bias. On the other hand, objective health measures are referred to concrete diseases, so they can be incomplete. Our analysis uses three dependent variables with the aim of avoiding previous obstacles. These variables capture physical and mental health levels in a global manner. The first variable is the *self- perceived health level*. It is an ordered discrete variable which measures the self- perceived physical health level individually in a scale that ranges from 1 to 5, with higher values of the variable indicating a worse health level.[4]

The second dependent variable captures if the individual suffers some *chronic disease*. It is a dummy variable which indicates if the individual has been anytime diagnosed some of the following diseases: heart attack, blood pressure or hypertension, blood cholesterol, a stroke or cerebral vascular disease, diabetes or high blood sugar, chronic lung disease, cancer or malignant tumour, stomach or duodenal ulcer, peptic ulcer, Parkinson disease, cataracts or hip fracture or femoral fracture.

Finally, we analyse a *mental health* variable based on the scale EURO-D (Prince et al., 1999). This variable indicates if the individual has suffered in the last month some of the following states or symptoms: depressed mood, pessimism, suicidal tendencies, guilt, sleep problems, lack of interest, irritability, appetite problems, fatigue, lack of concentration, lack of enjoyment, tearfulness.

4.2.2 Independent variables.

In this section, we list variables used as regressors. Given the aim of our analysis, *main independent variables* are a set of dummies related to the individual employment situation: employee, self-employed worker, civil servant, unemployed, retired, disabled, homemaker and other. We incorporate mutually exclusive categories as explanatory variables, so it is essential excluding one of them to avoid perfect correlation problems.

[4] Variable values correspond to the following health levels: 1 (excellent), 2 (very good), 3 (good), 4 (fair), 5 (poor).

In the present analysis, we exclude the employee category. In this way, we can interpret our results in relation to the excluded category, which will be our reference category.

In addition to main regressors, our estimations add some *control variables* which are related to health, employment situation, or both, according to previous literature (Di Gessa & Grundy, 2014). These variables include demographic characteristics such as gender (being female against being male), age, household size, education level, and households' financial situation. We also include variables associated to individual's healthy habits as smoking daily, and body mass index. Finally, our estimations include country and wave dummies.

4.3. METHODS

We use two different methodologies depending on the nature of the dependent variable. The first dependent variable, *self-perceived health level*, is an ordered discrete variable, and thus, the appropriate methodologies for its analysis are the ordered discrete-choice models. These models will be estimated through *logit* approaches.

On the other hand, the other two dependent variables (*chronic disease* and *mental health*) are discrete dichotomous variables, which should be estimated through discrete-choice models with a binary dependent variable. As in the previous case, we will use the *logit* function for these estimations.

5. RESULTS

This section presents the results of our empirical analysis about the association between employment situation of older people aged over 50 and their health level. These results are presented in tables 1 and 2, as it is explained hereafter. Table 1 includes three specifications (specifications I-III), which correspond to each of the three health variables defined in the previous section. We include as independent variables the main regressors, which reflect individual's employment situation; as well as demographic and

health habits control variables, and country and wave dummies, as mentioned in section 4.2.2.

On the other hand, table 2 presents two additional specifications (specifications IV and V). These specifications reproduce the analysis which has been made for two of our dependent variables, *self-perceived health level* and *mental health*, but adding as an additional control the respective health variable lagged one period.[5]

As regards the way our results are presented, the upper part of the table shows, for each specification, predicted probabilities for the mean values of the independent variables. In the case of specifications I (table 1) and IV (table 2), we present predicted probabilities that the self-perceived health level has some of the five possible values. Referring to specification II (table 1), we present the predicted probability of suffering a chronic disease. Finally, in relation with specifications III (table 1) and V (table 2), we present the predicted probability of suffering some of the symptoms included in the mental health variable.

Results are presented in a two-column format. The first column shows *marginal effects* of each independent variable on the respective predicted probability. In this way, marginal effects give information about how much this predicted probability increases when the independent variable increases by one unit in the case of continuous and discrete non-dichotomous independent variables and when the independent variable goes from 0 to 1 in the case of dichotomous discrete variables -dummies-. The second column shows the significance (t-statistic) of each variable.

5.1. MAIN RESULTS

Focusing on the results of table 1, our models predict that the probability of having an excellent health is around 10%, of having poor health achieves 7%; of having a chronic disease is around 56%; and of having depressive symptoms is over 75%.

[5] Because of the way in which the chronic disease variable is built (which is referred to whether the person has been ever diagnosed certain diseases), the analysis with the variable delayed one period for this dependent variable is not presented.

In this section, we focus on the results related with main independent variables, which are associated with the individual's employment situation. Firstly, we highlight that labour market participation improves health levels, both physical and mental dimensions. In this way, we observe that unemployed and inactive individuals (compared to employees) present higher probabilities of having a poor health level, a chronic disease, or mental health problems. These results reflect the importance of guaranteeing the active participation of people aged over 50 in society.

Concretely, in relation to different types of occupation, self-employment seems to be the most beneficial option in physical health terms, while paid work seems to beneficiate mental health. So, being a self-employed worker (as compared with being an employees) increases the probability of having an excellent health in 1.32 percentage points; and decreases the probability of having a poor health in 0.51 percentage points, or a chronic disease in 2.92 percentage points.

As it has been stated previously, these better health conditions could be explained by the bigger control and flexibility of self-employees in their work. However, being self-employed worker increases the probability of having mental health problems in 0.95 percentage points, as compared with paid-employees counterparts. This confirms that self-employed individuals are subject to higher stress levels.

On the other hand, table 2 shows that previous results remain if we control with the health level of the previous period. These associations remain the same, although effects' magnitude has decreased significantly. Thus, we discard that the whole labour participation effect in health is determined exclusively by a self-selection of healthy individuals into self-employment. Health level can determinate individual's job choice, although job's type can significantly affect health levels too.

5.2. RESULTS RELATED TO CONTROL VARIABLES

In this section, we present briefly results related to control variables. We observe that women (compared to men) present a lower probability of having an excellent health, and a higher probability of having a poor health or a mental disease.

Our analysis also confirms that people with an advanced age present a lower probability of having an excellent health (-0.22%), and a higher probability of having a poor health (0.15%), or a chronic disease (1.45%). The obtained results for mental health and age are non-significant.

On the other hand, in households where three people or more live (compared to households where one person lives), the individual presents a higher probability of having an excellent health (0.40%), and a lower probability of having a poor health (-0.3%).

Furthermore, individuals with a secondary or tertiary education (compared to individuals with a basic or lower education) present a higher probability of having a better physical health (2.21% and 4.9% respectively), and a lower probability of suffering a mental disease (-2.14% and -2.33%). There are different arguments which explain the relationship between health and education. Some authors consider that education can improve health just because it implies bigger resources, including healthcare access (Cutler & Lleras- Muney, 2006).

Other authors think that individuals with a higher education can choose more satisfactory jobs with better conditions and salary, health insurances and safer work environments (Mirowsky & Ross, 2008). In any case, it is showed that higher education levels imply improvements in the individual's health.

A similar effect occurs with the individual's financial situation. Concretely, individuals, whose household makes ends meet easily, present higher probabilities of having an excellent health (2.87%), and a lower probability of having a poor health (-2.06%), a chronic disease (-2.47%), or a mental disease (-4.81%). This effect can be due to a higher source of income, and a better healthcare access.

Finally, we are going to explain the variables associated with individual's health habits. Results show that individuals, who have ever smoked throughout life, present worse health levels, both mental and physical. In relation with the body mass index, it is important to highlight that obesity has a considerable effect in chronic diseases increase, since obesity rise the possibility of suffering any type of chronic disease in 25%.

Table 1. Determinants of mental and physical health

Specification	I										II		III	
Model	Ordered *Logit*										*Logit*		*Logit*	
Health measure	Self-perceived health level										Chronic disease		Mental health	
	Excellent		Very good		Good		Fair		Poor					
Predicted probability (*y*)	0.0981		0.2161		0.3835		0.2296		0.0727		0.5597		0.7583	
Independent variables (*x*)	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*
Employment situation														
Employee [a] (*ref.*)														
Self-employed worker [a]	0.0132	6.29***	0.0134	6.51***	-0.0064	-5.96***	-0.0150	-6.51***	-0.0051	-6.61***	-0.0292	-5.54***	0.0095	2.11**
Civil servant [a]	-0.0392	-2.26**	-0.0043	-2.24**	0.0017	2.30**	0.0049	2.24**	0.0017	2.23**	0.0034	0.72	0.0146	3.49***
Unemployed [a]	-0.0342	-17.85***	-0.0435	-16.05***	0.0080	16.62***	0.0497	15.86***	0.0199	14.43***	0.0163	2.59***	0.0610	10.91***
Retired [a]	-0.0365	-27.47***	-0.0470	-27.64***	0.0079	17.01***	0.0539	28.08***	0.0218	28.38***	0.0630	15.72***	0.0240	6.75***
Disabled [a]	-0.1048	-90.25***	-0.2004	-117.03***	-0.1657	-53.26***	0.2227	111.29***	0.2482	60.32***	0.2047	35.96***	0.1649	36.95***
Homemaker [a]	-0.0294	-17.78***	-0.0365	-16.80***	0.0080	16.72***	0.0416	16.81***	0.0163	15.94***	0.0356	6.92***	0.0169	3.54***
Other [a]	-0.0348	-11.52***	-0.0444	-10.05***	0.0080	15.91***	0.0508	9.86***	0.0204	8.78***	0.0322	3.13***	0.0513	5.73***
Control variables														
Women [a]	-0.0078	-9.29***	-0.0094	-9.32***	0.0010	8.05***	0.0107	9.34***	0.0055	9.35***	-0.0150	-5.80***	0.1068	45.61***
Age	-0.0022	-21.69***	-0.0026	-21.84***	0.0003	14.08***	0.0030	21.87***	0.0015	21.59***	0.0145	48.84***	0.0002	0.92
Household size														
A person [a] (ref.)														
Two people [a]	0.0024	2.17**	0.0030	2.16**	-0.0002	-2.39**	-0.0034	-2.16**	-0.0018	-2.15**	0.0059	1.68*	-0.0280	-8.99***
Three people or more [a]	0.0040	3.21***	0.0050	3.19***	-0.0004	-3.34***	-0.0056	-3.19***	-0.0030	-3.18***	-0.0028	-0.72	-0.0117	-3.36***
Education level														
Basic education or lower [a] (*ref.*)														
Secondary education[a]	0.0221	25.94***	0.0318	25.55***	0.0003	1.51	-0.0355	-25.64***	-0.0186	-25.34***	-0.0161	-5.43***	-0.0214	-8.11***
Tertiary education[a]	0.0491	41.68***	0.0623	42.04***	-0.0090	-17.93***	-0.0691	-43.03***	-0.0334	-43.46***	-0.0278	-8.02***	-0.0233	-7.68***
Households' financial situation	0.0287	58.97***	0.0350	62.90***	-0.0034	-17.61***	-0.0397	-63.51***	-0.0206	-57.46***	-0.0247	-17.73***	-0.0481	-37.94***
Smoke daily[a]	-0.0149	-18.99***	-0.0182	-19.05***	0.0018	13.43***	0.0206	19.04***	0.0107	18.92***	0.0399	16.43***	0.0268	12.50***
Body mass index														
Low weight [a] (*ref.*)														
Normal weight [a]	0.0452	14.19***	0.0590	11.66***	-0.0050	-4.29***	-0.0668	-11.35***	-0.0325	-9.63***	0.0132	1.08	-0.0457	-4.12***
Overweight [a]	0.0224	7.09***	0.0324	6.40***	0.0017	1.54	-0.0371	-6.29***	-0.0194	-5.72***	0.1178	9.60***	-0.0367	-3.31***
Obesity [a]	-0.0119	-3.77***	-0.0203	-3.98***	-0.0066	-5.64***	0.0239	4.02***	0.0147	4.30***	0.2591	20.95***	-0.0015	-0.14
Country dummies (29 categories; *ref*. Spain)	Yes										Yes		Yes	
Wave dummies (7 categories; *ref*. 2004)	Yes										Yes		Yes	
Number of observations	160,187										160,288		160,288	
Log-likelihood	-210,174.88										-100,727.24		-83,747.29	

Notes: * 0.1 >*p* ≥ 0.05; ** 0.05 >*p* ≥ 0.01; *** *p*< 0.01. [a] *Dummy* variable. *Source: Own elaboration based on SHARE'S micro data.*

Table 2. Determinants of the physical and mental health level - Controlling by the health level in t-1

Specification	IV										V	
Model	Ordered *Logit*										*Logit*	
Health measure	Self-perceived health level										Mental health	
	Excellent		Very good		Good		Fair		Poor			
Predicted probability (*y*)	0.0926		0.2143		0.3916		0.2352		0.0661		0.7491	
Independent variables (*x*)	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*	d*y*/d*x*	*t*
Employment situation												
Employee [a] (*ref.*)												
Self-employed worker [a]	0.0050	2.06**	0.0052	2.08**	-0.0009	-1.88*	-0.0065	-2.08**	-0.0028	-2.1**	0.0183	2,69***
Civil servant [a]	-0.0017	-0.86	-0.0018	-0.86	0.0002	0.89	0.0023	0.86	0.0010	0.86	0.0134	2.24**
Unemployed [a]	-0.0175	-6.64***	-0.0203	-6.24***	0.0005	1.37	0.0253	6.27***	0.0121	5.93***	0.0462	5.16***
Retired [a]	-0.0130	-7.97***	-0.0147	-7.98***	0.0008	4.21***	0.0184	8.02***	0.0086	8.22***	0.0185	3.60***
Disabled [a]	-0.0652	-39.67***	-0.0100	-33.59***	-0.0398	-16.0***	0.1202	34.0***	0.0848	26.2***	0.1354	18.14***
Homemaker [a]	-0.0144	-6.91***	-0.0164	-6.69***	0.0007	3.46***	0.0205	6.73***	0.0096	6.59***	0.0267	3.86***
Other [a]	-0.0147	-3.61***	-0.0167	-3.40***	0.0007	2.3**	0.0208	3.41***	0.0098	3.23***	0.0426	3.20***
Control variables												
Women [a]	-0.0015	-1.41	-0.0016	-1.42	4.75E-05	1.30	0.0020	1.42	0.0011	1.42	0.0805	23.93***
Age	-0.0012	-8.51***	-0.0013	-8.52***	3.67E-05	3.80***	0.0016	8.52***	0.0009	8.49***	0.0008	1.88*
Household size												
A person [a] (ref.)												
Two people [a]	0.0002	0.16	0.0002	0.16	-6.29E-06	-0.17	-0.0003	-0.16	-0.0002	-0.15	-0.0216	-4.96***
Three people or more [a]	0.0010	0.60	0.0011	0.60	-3.1E-05	-0.61	-0.0013	-0.60	-0.0007	-0.60	-0.0030	-0.59
Education level												
Basic education or lower [a] (*ref.*)												
Secondary education[a]	0.0076	6.71***	0.0091	6.62***	0.0002	2.21**	-0.0110	-6.64***	-0.0059	-6.65***	-0.0135	-3.54***
Tertiary education[a]	0.0200	14.20***	0.0226	13.92***	-0.0012	-5.62***	-0.0273	-14.06***	-0.0141	-14.43***	-0.0150	-3.46***
Households' financial situation	0.0155	26.42***	0.0172	26.65***	-0.0005	-4.13***	-0.0209	-26.97***	-0.0113	-26.25***	-0.0364	-19.64***
Smoke daily[a]	-0.0065	-6.65***	-0.0072	-6.64***	0.0002	3.57***	0.0087	6.64***	0.0047	6.65***	0.0135	4.40***
Body mass index												
Low weight [a] (*ref.*)												
Normal weight [a]	0.0337	8.73***	0.0416	7.44***	0.0023	1.49	-0.0502	-7.52***	-0.0273	-6.47***	-0.0356	-2.27**
Overweight [a]	0.0237	6.14***	0.0306	5.47***	0.0035	2.30**	-0.0368	-5.51***	-0.0209	-4.92***	-0.0321	-2.04**
Obesity [a]	0.0030	0.78	0.0043	0.77	0.0011	0.71	-0.0052	-0.77	-0.0032	-0.75	-0.0039	-0.25
Self-perceived health level in *t*-1	-0.0874	-103.2***	-0.0971	-131.71***	0.0027	4.24***	0.1181	139.22***	0.0636	84.76***		--
Depression in *t*-1 [a]		--		--		--		--		--	0.2071	73.33***
Country dummies (29 categories; *ref*. Spain)						Yes						Yes
Wave dummies (7 categories; *ref*. 2004)						Yes						Yes
Number of observations						74,783						74,888
Log-likelihood						-85,347.52						- 37,851.83

Notes: * 0,1 >*p* ≥ 0,05; ** 0,05 >*p* ≥ 0,01; *** *p*< 0,01. [a] *Dummy* variable. *Source: Own elaboration based on SHARE'S micro data.*

6. CONCLUSIONS

In this paper, we have analysed the association between the employment situation of Europeans aged over 50, and their health level. Among the main obtained results, it is highlighted that individuals who participate actively in the labour market present better physical and mental health levels. Particularly, if we focus on the differences between self-employees and employees, it is observed that self-employment encourages better physical health levels, both in objective and subjective terms. By contrast, it implies higher probabilities of having mental health problems. Other relevant results state that individuals with better financial conditions, or higher education levels, present better health levels. Finally, we have obtained that certain health habits, as smoking daily or being obese, decrease considerably older people health levels.

Particularly, these results have implications for active ageing policy makers. On one hand, it is necessary to consider self-employment as a viable alternative for early retirement, since it allows older people to be active and healthy. Thus, authorities should strengthen support programmes which promote entrepreneurial initiatives among older workers by designing tools to manage the stress associated with this type of work, because it can conditionate individual's physical health.

Referring to pensions systems, we propose a reorientation of pension policies, since these policies have had the retirement age increase as their main objective. That is to say, Member States should give absolute priority to guarantee the necessary sources of income for this age group. The main problem is that a lot of older people receive their pension as the unique source of income, which is not enough in most occasions. As a consequence, this lack of income not only can restrict their participation in society, but it also implies worse mental and physical health levels.

On the other hand, higher education plays an important role in the participation decision, because it provides higher knowledge and necessary abilities in the job position, and better health conditions to older people. However, it exists a general opinion that adult learning is the weakest link in the lifelong learning systems' development (Council of the EU, 2011). In this way, it is necessary that policymakers

keep on promoting higher education and learning, and increasing capital human investment.

At the same time, the improvement of public health policies, and especially, health promotion and disease prevention can encourage health awareness, and individual's healthy attitudes. All it has been stated previously will contribute to achieve better health levels.

All in all, increasing older people labour participation will not be an easy task, because it will suppose important changes in entrepreneurs and older workers' attitudes, and in policy instruments. Additionally, European policies have not paid enough attention yet to healthy ageing, since they are still considering older people health as a cost instead of a long-term investment in human capital. Nevertheless, there is an ever-increasing awareness that a healthy and active society is a key factor to achieve economic growth and sustainable productivity in an ageing Europe.

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APPENDIX

Table A.1. Detailed description of the variables used in the analyses.

Variable	Description
	Dependent variables
Self-perceived health level (1-5)	Discrete ordered variable which measures the self-perceived health level on a scale of 1 (excellent) to 5 (poor). This variable lagged one period is used as explanatory variable in specification IV (Table 2),
Chronic disease (0-1).	*Dummy* equals 1 for individuals claiming that the doctor has ever confirmed that he has any of the following diseases: heart attack, blood pressure or hypertension, blood cholesterol, a stroke or cerebral vascular disease, diabetes or high blood sugar, chronic lung disease, cancer or malignant tumour, stomach or duodenal ulcer, peptic ulcer, Parkinson disease, cataracts or hip fracture or femoral fracture.
Mental health (0-1)	*Dummy* equals 1 for individuals claiming to have suffered any of the following states or symptoms: depressed mood, pessimism, suicidal tendencies, guilt, sleep problems, lack of interest, irritability, appetite problems, fatigue, lack of concentration, lack of enjoyment, tearfulness. This variable lagged one period is used as explanatory variable in specification V (Table 2).
	Independent variables
Employment situation	
Employee (0-1) (*ref.*)	*Dummy* equals 1 for employees.
Self-employed (0-1)	*Dummy* equals 1 for self-employed workers.
Civil servant (0-1)	*Dummy* equals 1 for civil servants.
Unemployed (0-1)	*Dummy* equals 1 for unemployed.
Retired (0-1)	*Dummy* equals 1 for retired.
Disabled (0-1)	*Dummy* equals 1 for disabled or permanently disabled people.
Homemaker (0-1)	*Dummy* equals 1 for homemaker.
Other (0-1)	*Dummy* equals 1 for people whose employment situation is different from the previous ones.
Control variables	
Woman (0-1)	*Dummy* equals 1 for women.
Age (50-69)	Individual's age (ranges from 50 to 69).
Household size	
A person (0-1) (*ref.*)	*Dummy* equals 1 for individuals who live alone.
Two people (0-1)	*Dummy* equals 1 for individuals who live with another person.
Three people or more (0-1)	*Dummy* equals 1 for individuals who live with two or more people.
Education level	
Basic or lower education (0-1) (*ref.*)	*Dummy* equals 1 for individuals with basic or lower education (ISCED 1-2).
Secondary education (0-1)	*Dummy* equals 1 for individuals with secondary education or non-university specialized education (ISCED 3-4).
Tertiary education (0-1)	*Dummy* equals 1 for individuals with a university education or master's degree and PhD (ISCED 5-6).
Households' financial situation (1-4)	Discrete ordered variable which measures if the individual's household can make ends meet on a scale of 1 (the individual's household makes ends meet with difficulty) to 4 (the individual's household makes ends meet very easily).
Smoke daily (0-1)	*Dummy* equals 1 for individuals claiming to have ever smoked daily throughout their lives.
Body mass index	
Low weight (0-1)	*Dummy* equals 1 for individuals whose body mass index is less than 18.5.

Normal weight (0-1)	*Dummy* equals 1 for individuals whose body mass index is between 18.5 and 24.9.
Overweight (0-1)	*Dummy* equals 1 for individuals whose body mass index is between 25 and 29,9.
Obesity (0-1)	*Dummy* equals 1 for individuals whose body mass index is greater than 30.
Country dummies	29 *dummies* equalling 1 for individuals who live in any of the following countries: Austria, Belgium, Bulgaria Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Finland, Germany, Greece, Hungary, Ireland Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain (*ref.*), Sweden, Switzerland.
Wave dummies	7 *dummies* equalling 1 for the observations corresponding to each of the seven waves: 2004 (ref.), 2006, 2010, 2013, 2015, 2016 and 2017.