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Fundación MAPFRE

THE SENIOR ECONOMY TRACKER: QUANTIFYING THE PROGRESS OF THE LONGEVITY ECONOMY IN EUROPE

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Presentation

Together with climate change and the pace of technological change, population aging is the third corner of the triangle that is altering the foundations of the socioeconomic environment on a global scale. There is a palpable need to anticipate the consequences of these phenomena so that we can adapt to them and, as far as possible, minimize their negative effects. Demographic evolution brings with it certain consequences that impact on basic aspects of our societal organization. Focusing on the European model, founded on the concept of the welfare state, this means that pensions, health and long-term care schemes are being affected.

However, demographic change offers unmissable opportunities, because falling birth rates and the increase of life expectancy can be offset by improved health and vitality in individuals at ages that, until a few decades ago, were considered to herald the onset of old age. Improved prevention, medical advances and the culture of healthy aging are making it possible to enjoy an additional period of fully active life and regain the demographic dividend that our societies already previously enjoyed with the "baby boom" from the middle of the last century.

To help raise awareness and promote these opportunities, in 2020 Fundación Mapfre launched the Ageingnomics Research Center, whose specific objective is to analyze, measure and monitor the Silver Economy, in other words, the part of the economy that revolves around older adults. This group, which can be defined as people aged 50 - 55 and up, is already the main group demanding goods and services in our economies, driving sectors of activity that go beyond the traditional health and care sectors, including security, housing, cosmetics and fashion, tourism, transport, culture, banking and insurance. On the other hand, today's senior generation has skills and attitudes that allow its members to increasingly engage in the labor market, either as employees or entrepreneurs and self-employed workers, while remaining flexible and willing to decide on how much they want to participate and how long they want to remain in the workforce.

Turning the potential of older adults into tangible realities requires coupling demographic evolution with that of the economic and social spheres; and, in order to determine the extent to which this occurs, it is advisable to have measurement and analysis tools that make it possible to monitor this evolution in specific regions, as well as compare the situation between different geographical areas, to help import best practices or, where appropriate, apply corrective measures. This is why the Ageingnomics Research Center decided to develop a method for measuring the Silver Economy, a task it entrusted to a research team at the University of Comillas, with which the Center has worked intensively to define the objective and scope of the study.

The Senior Economy Tracker, resulting from a combination of the dimensions and indicators chosen to typify the Silver Economy, is a first step that can be enriched with inputs from the scientific community, the authorities in the different economic spheres and experts in this field, as well as with the experience resulting from its application and the availability of the necessary data. We are confident that this proposal will be useful for its intended purpose and we are grateful for any suggestions and contributions that people who are interested in this work will be kind enough to send us.

Juan Fernández Palacios
Director of the Ageingnomics Research Center
in MAPFRE Foundation

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Executive Summary

This work has been commissioned by Fundación MAPFRE's Ageingnomics Research Center with the aim of developing a methodology to measure the progress of the longevity economy and its application to European countries. Fundación MAPFRE's Ageingnomics Research Center seeks to promote and disseminate the economic and social benefits associated with longevity, while contributing positively to economic activity related to the demographic transition. In order to measure and monitor the degree of national progress towards the longevity economy, we propose a composite indicator, the Senior Economy Tracker.

The Senior Economy Tracker offers a holistic view of national or regional progress toward a longevity-oriented economy, adjusted for population pressure.

Main ideas and results:

- Long-lived societies constitute the most important demographic change in recent years, known as the demographic transition.
- In the absence of indicators to measure the progress of the longevity economy as a whole, this study proposes a holistic indicator to quantify the progress of the longevity economy: the Senior Economy Tracker.
- The Senior Economy Tracker is made up of four dimensions: Social, Institutional, Macroeconomic, and Individual. In turn, each dimension is composed by several categories. In total, it collects 53 public access variables per country and year.
- The Senior Economy Tracker highlights the progress made in the field of longevity economics and the positive externalities offered by the longevity dividend.
- Denmark is the country with the greatest progress in the development of the longevity economy in our sample, with 43.41 points.
- Spain shows an intermediate degree of progress in relation to the 27 European countries considered, with 31.02 points.
- The countries of Eastern Europe are the ones with the weakest evolution, with Croatia being the worst of the entire sample with 18.22 points.
- When grouping the countries by geographical area, we observe that that Northern Europe shows the greatest progress, followed by Central and Mediterranean Europe. The worst results are found in Eastern Europe.
- The Senior Economy Tracker's ranking of countries presents an important parallel with their ranking by GDP per capita.
- Developments over the 2005-2020 study period show an increasing trend in all countries.
- In Spain, the Senior Economy Tracker has grown by 12% between 2015 and 2020, and by 7.5% and 16% in each of the previous five years.
- In the analysis by dimensions, Denmark, the Netherlands and Norway lead, respectively, the institutional, macroeconomic and individual dimensions in 2020. Italy and Spain lead the social dimension, made up of demographic variables.
- Sensitivity analyses with different weighting and aggregation options confirm the robustness of the Senior Economy Tracker.

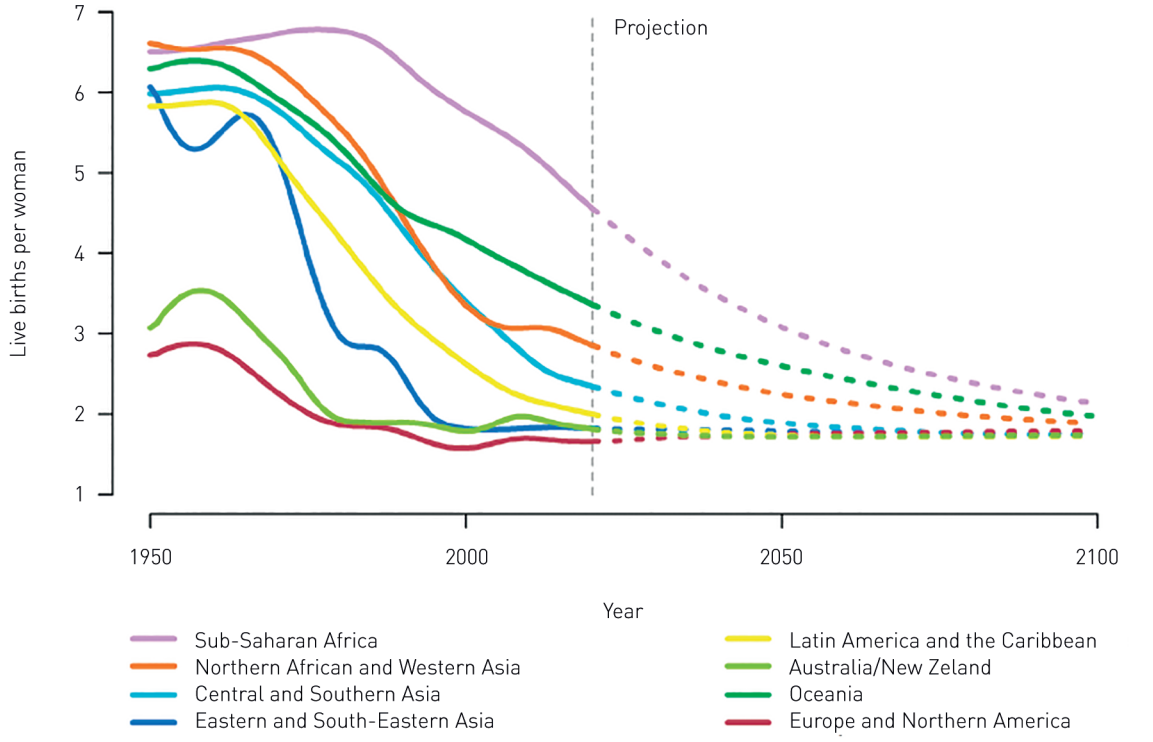
1. The Longevity Economy: A Quantitative Approach

1.1. The demographic transition

The United Nations (UN) (2019) warns that we are facing a profound demographic transformation, which will lead to a global demographic transition, a "*sine qua non*" consequence of economic and social development (World Economic Forum, 2016). The demographic transition is mainly due to two vectors of change: the reduction in the birth rate and the increase in life expectancy or longevity. These dynamics are reflected in the greatest demographic change experienced in recent decades: long-lived societies.

Fertility rates have declined over the past few decades in a large number of countries (Figure 1). This phenomenon is due to behavioural (Bloom *et al.*, 2015) and institutional changes related to economic and social development, including: reduction in infant mortality, improved education (particularly for women and girls), enhanced urbanisation, increased access to reproductive health services (including family planning), and women's empowerment. as well as their growing participation in the world of work. The UN (2019) indicates that currently about half of the world's population lives in countries where the birth rate is below 2.1 children per woman. This value constitutes the frontier that determines zero population growth in the long term, if the mortality rate is also low.

Figure 1. Evolution of the birth rate (1950-2100)

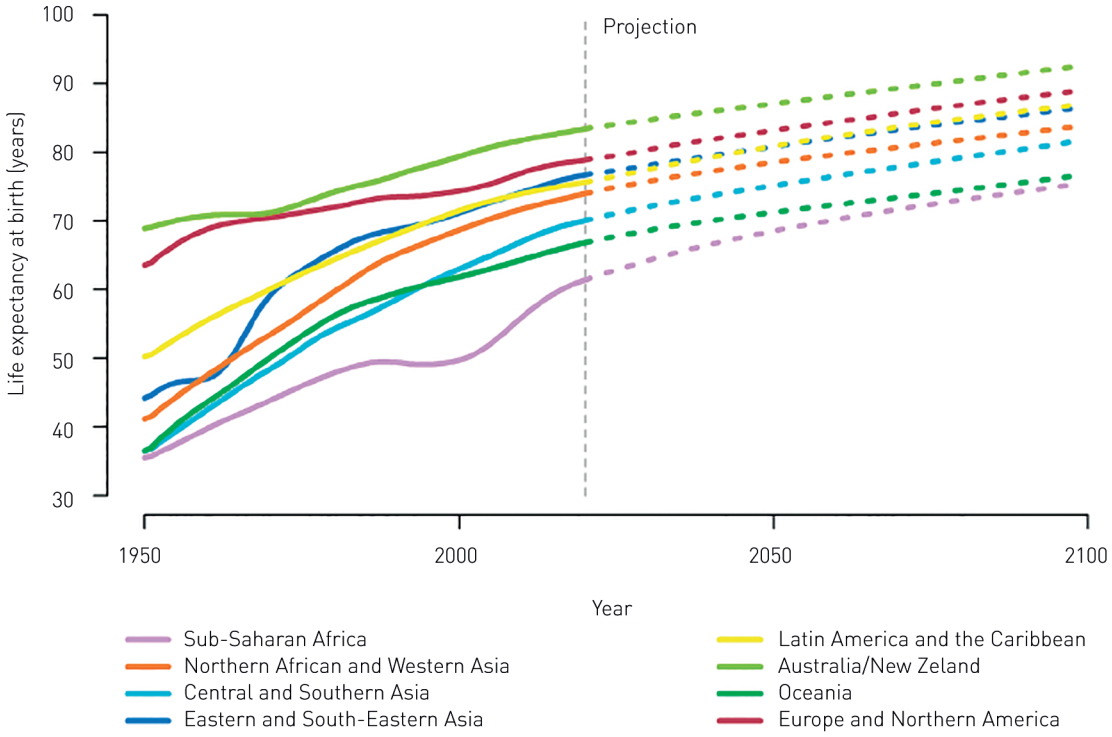


Source: United Nations Department of Economic and Social Affairs, Population Division (2019).

The reduction in the birth rate is accompanied by a decrease in mortality (in general, not only infants), or in other words, a clear increase in life expectancy. The decline in mortality is part of progress in areas such as access to modern medicine, income security, poverty reduction through pensions and other social benefits, access to clean water, sanitation and electricity, and hunger reduction, among others. These advancements reflect the success of human effort, resulting in a significant improvement in life expectancy and also in the quality of life. UN's estimates (2019) show that the life expectancy of the world's population will increase to 77.1 by 2050, from 72.6 years in 2022 and 66 years in 1990 (Figure 2). In developed countries, life expectancy values are improving dramatically. For example, the Mapfre Research Service (2019) indicates that life expectancy in the regions of Australia-New Zealand, Europe and North America will increase from 85 years (2019) to 88 years by 2055-2060, reaching 93 years by 2100. The case of Spain (ranked among the five countries with the highest life expectancy) is, if possible, more extreme: the same source estimates a life expectancy of 90 years for 2055-2060 and 95 years for 2100.

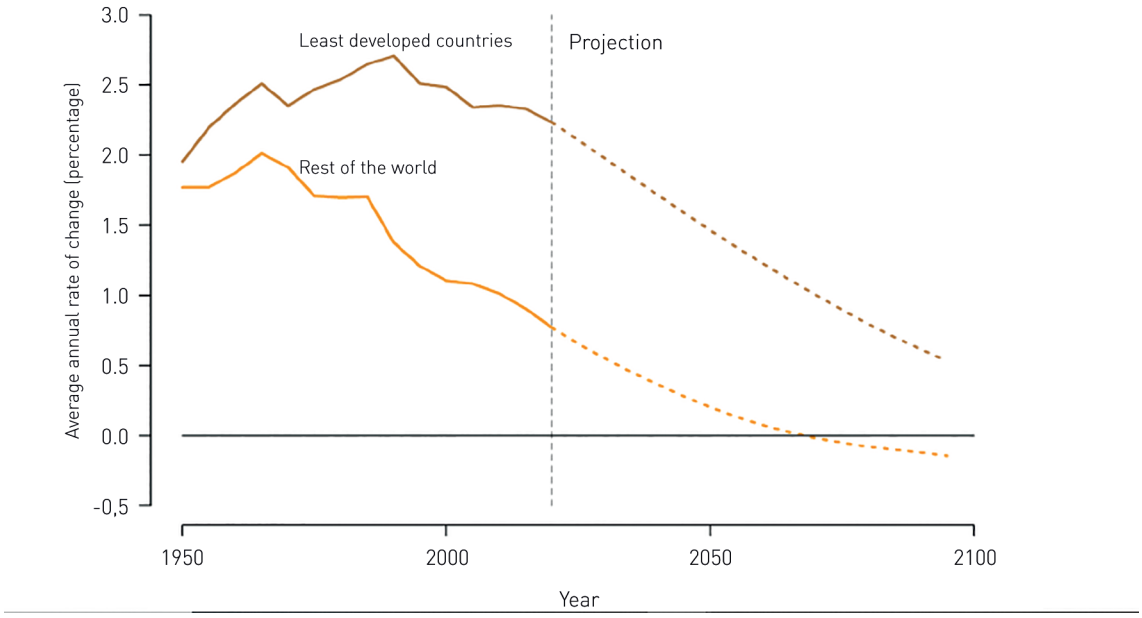
The reduction in birth and mortality levels presented in the previous paragraphs mark important changes in trend or demographic transition in terms of population size and the composition of the underlying age groups. Regarding population size, the UN (2019) estimates that the world population growth rate will attenuate, reaching the lowest population growth rate since 1950. Estimates from this source indicate that the world population will increase to 8.5 billion (2030), 9.7 billion (2050) and 10.9 billion (2100). The difference between developed and developing countries in this regard is very pronounced in the short term (Figure 3): while the population in developing countries will continue to increase, in many developed countries there will be a demographic decline from mid-century onwards (Huertas, 2020; UN, 2019). The World Health Organization (2019) states that 25% of the European Union's population will be over 65 years of age by 2050, which will reduce the labour force by more than 30% (European Commission, 2019). Spain is no stranger to this reality: predictions by the INE estimate that by 2050 the proportion of the population aged 65 or over will be 34% compared to 21% today. In any case, in the long term, we can expect convergence between developed and developing countries in the process of demographic transition.

Figure 2. Evolution of life expectancy (1950-2100)



Source: United Nations Department of Economic and Social Affairs, Population Division (2019).

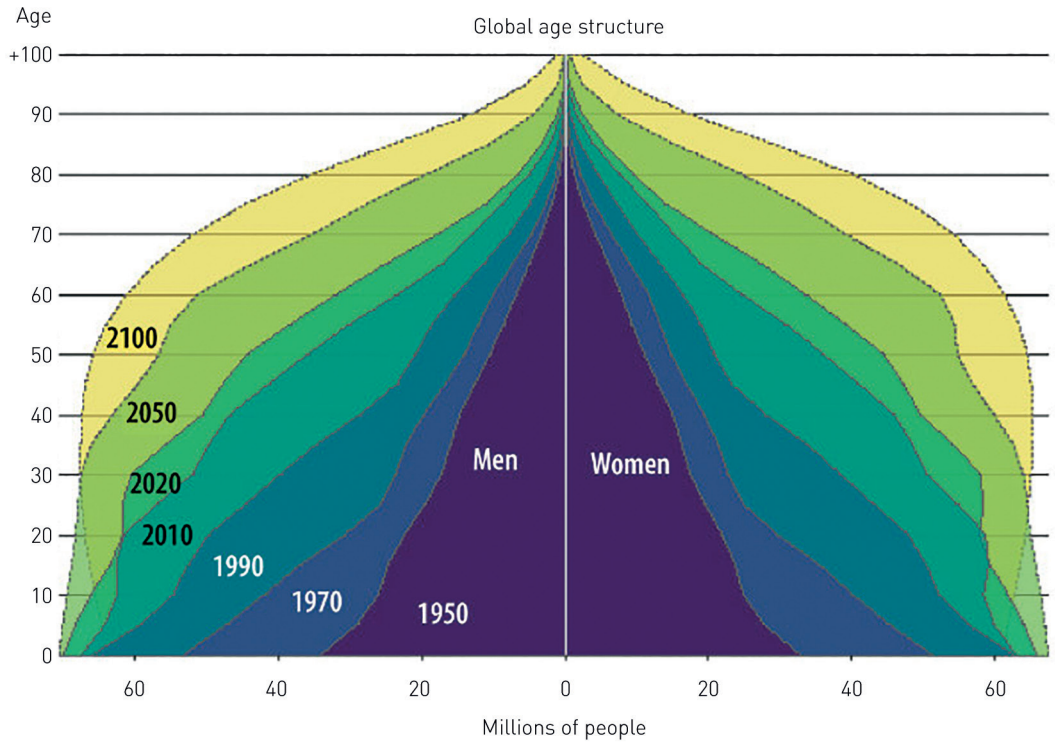
Figure 3. Evolution of population growth rates (1950-2100)



Source: United Nations Department of Economic and Social Affairs, Population Division (2019).

The distribution of the population by age group at the global level shows that the main consequence of the global demographic transition is a longer-lived society. According to the UN (2019), 2018 was the first year in which the population aged 65 years or older surpassed the population under 5 years of age. Predictions suggest that, following this trend, by 2050 the number of people aged 65 and over will be higher than the number of adolescents and young people (aged 15-24). The population pyramid represented in Figure 4 illustrates the effects of the demographic transition. On the horizontal axis, population growth since 1950 can be observed, although the growth rates are attenuated. The vertical axis shows the population structure by age group, highlighting over time the strong increase in the age group from 65 years of age. The age structure makes the figure go from a pyramid in 1950 to an inverted U in 2100.

Figure 4. The Global Demographic Transition and Long-Lived Societies



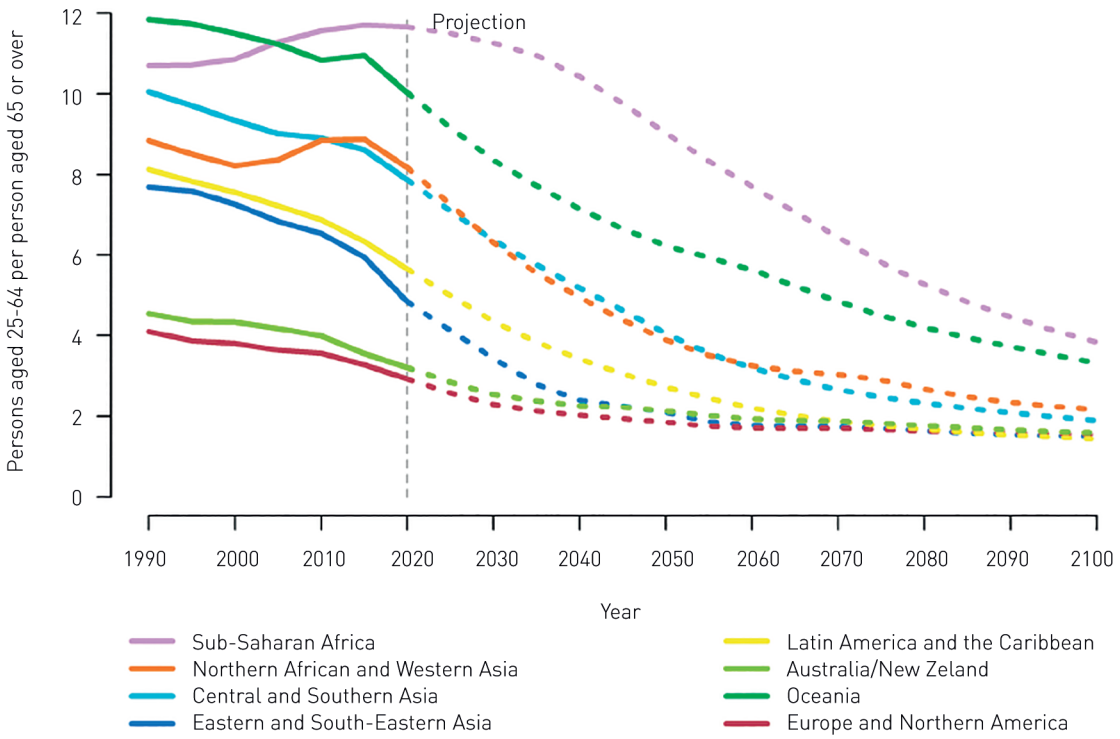
Source: United Nations Department of Economic and Social Affairs, Population Division (2017).

1.2. The longevity economy

The longevity of the population is framed in the so-called '*societal grand challenges*' (Bill and Melinda Gates Foundation). Major societal challenges are driven by social phenomena (Buckley *et al.*, 2017), in the case of longevity, driven by demographic transition. In addition, the grand challenges span multiple levels of analysis. In other words, they can and should be analyzed at the regional, country or industry level, and also from the point of view of the different economic agents or interest groups (Buckley *et al.*, 2017).

The demographic transition poses a number of societal challenges, e.g., the dependency ratio (Figure 5) increasing from 28% (2015) to 50% (2060) according to European Union estimates (2018). This trend may raise fears of a crisis in government funding of health systems, pensions, and intergenerational equity (Peine *et al.*, 2015) and, in short, the welfare system.

Figure 5. Evolution of the dependency ratio



Source: United Nations Department of Economic and Social Affairs, Population Division (2019).

However, the World Health Organization (WHO) (2019) clarifies that there is no empirical evidence that the aging of the population leads to an unsustainable economic situation. The great challenge of the ageing of society can be offset by the so-called "longevity dividend" or positive externalities associated with the demographic transition. According to Olshansky *et al.* (2007), it is the combination of the social, economic and health benefits derived from delaying ageing, understood from a biological point of view. This delay extends the period of full physical and mental capacities, allowing them to work for more years, increase their accumulated income and savings and, therefore, reduce the impact on pension systems.

At the same time, multiple opportunities for business, economic and social growth are emerging, such as the "*silver economy*", which incorporates radical socio-economic changes and influences organisational and institutional behaviour. In the words of the European Commission (2015)[1], "Rapid demographic ageing is not only a major societal challenge (in terms of public budgets, workforce, competitiveness and quality of life), but also a huge opportunity for new jobs and growth, also known as the Silver Economy". As a result, the European Commission defines the silver economy as "the sum of all economic activity that meets the needs of people aged 50 and over, including products and services they buy directly and additional economic activity" (European Commission, 2018). It is also considered as "an environment in which the over-60 years interact and thrive in the workplace, engage in innovative entreprise, help drive the marketplace as consumers, and lead healthy, active and productive lives" (OECD, 2014), or, "the silver economy is a concept that attempts to capture the economic effects and opportunities resulting from an ageing population" (World Health Organization, 2019). Along the same lines, Fundación Mapfre proposes the concept of 'Ageingnomics' formed by the convergence between ageing and economics, denoting the potential of this tandem and the

1 Comisión Europea (2015): 'Growing the European Silver Economy'.

positive perspectives on the economic opportunities of the demographic transition[2].

The longevity economy represents a constructive and optimistic view of the economic consequences of the demographic transition. The longevity economy refers to the opportunities for governments, businesses, societies, and individuals that arise from adapting and creating policies, products, and processes to the needs of aging populations (Scott, 2021). The longevity economy, similar to any other economic system, is composed by a range of different economic actors that affect or may be affected by the system, such as individuals, organizations, governments, non-profit organizations, and society at large. Therefore, a successful management of the great social challenge represented by the demographic transition requires the participation of different economic agents, public and private (Gallouj *et al.,* 2015). In addition, in order to adequately respond to the challenges associated with the demographic transition and turn them into opportunities, it is necessary to understand the longevity economy notion in a comprehensive way, adequately quantify its risks and opportunities, demystify false taboos associated with population ageing and propose policies that adequately manage the risks and opportunities arising from it.

A challenge common to all longevity studies is to delineate the population group or birth cohort associated with the concept of population ageing. A birth cohort is conformed by a population group that shares relevant events throughout their lives (a World War, man to the moon, or a pandemic), beyond fitting a specific age group (Gilleard & Higgs, 2005). In addition, the delimitation is confusing since, according to Gallouj *et al.* (2015: 87) "the ageing population does not form a homogeneous group in terms of income, educational level, physical and health status, place of life (urban/rural) and even age range". Therefore, there is no agreement in academic literature, nor among supranational institutions, on the optimal threshold at which the population is considered 'aged'. Some authors even suggest that a moving average should be considered when associating an age group with the concept of ageing (Abellán-García *et al.,* 2018) or even a dynamic threshold (Sanderson & Scherbov, 2005). As a result of this debate, different supranational organisations apply the notion of ageing to different age lines (see Table 1). In the same vein, other authors consider that the focus should shift from 'chronological' age to 'biological' age (Gratton & Scott, 2016), which implies that the potential negative macroeconomic effects of population ageing diminish (Sanderson & Scherbov, 2005). As Rodríguez-Pardo and López-Farré (2017: 261) indicate, 'the basic unit of mea (2017: 261) indicate, 'the basic unit of measurement of biometric science, which is chronological age considered in isolation, does not adequately measure the risk of death of an individual in a precise and limited time, and even more, if the assessment refers to the risk of longevity, actuarial uncertainty forces us to rethink the predictive value of chronological age. We give way to biological age as an alternative or at least complementary proposal to mere chronological age.

2 The opportunities of the silver economy can arise in the following niches of economic activity (Huertas & Ortega, 2000: Ortega, 2018): i) Leisure and tourism: with longer lives, more free time and considerable purchasing power, the demand for silver tourism and health tourism presents great business opportunities that have not been developed so far (World Economic Forum, 2016); ii) Health: To promote active ageing, the World Health Organization (2019) recommends new approaches to health and care that could change the relationship between disability and independence. (iii) Work: according to the World Economic Forum (2016), the longevity economy will be an engine of growth and jobs. In addition, it is necessary to adapt current jobs to a longer-lived population, avoiding ageism. It is also necessary to study the economic value and informal/unpaid work of seniors (World Health Organization, 2019); (iv) Housing: the accessibility of housing is essential to improve the quality of life of a long-lived population. According to the barometer on senior consumption (Fundación MAPFRE, 2020), the vast majority of Spanish seniors aspire to live until their death in their home, which opens up a multitude of opportunities for renovations, home automation (smart homes) and home care services; v) Finance: different studies (Lee *et al.,* 2014) debunk the popular belief that older people are economically dependent on the State. On the other hand, it is necessary to study in depth the implications of the ageing of the population on the pension system, which is an incentive for the pension companies to be able to pay for the pension system. bare ownership or annuities; vi) Technology: Acemoglu and Restrepo (2017) argue for a positive relationship between technology (robotics) and longevity, giving rise to gerontechnology. These dynamics create business opportunities and contribute to improving the quality of life of seniors.

Table 1. Age Groups as Thresholds for Longevity Economics

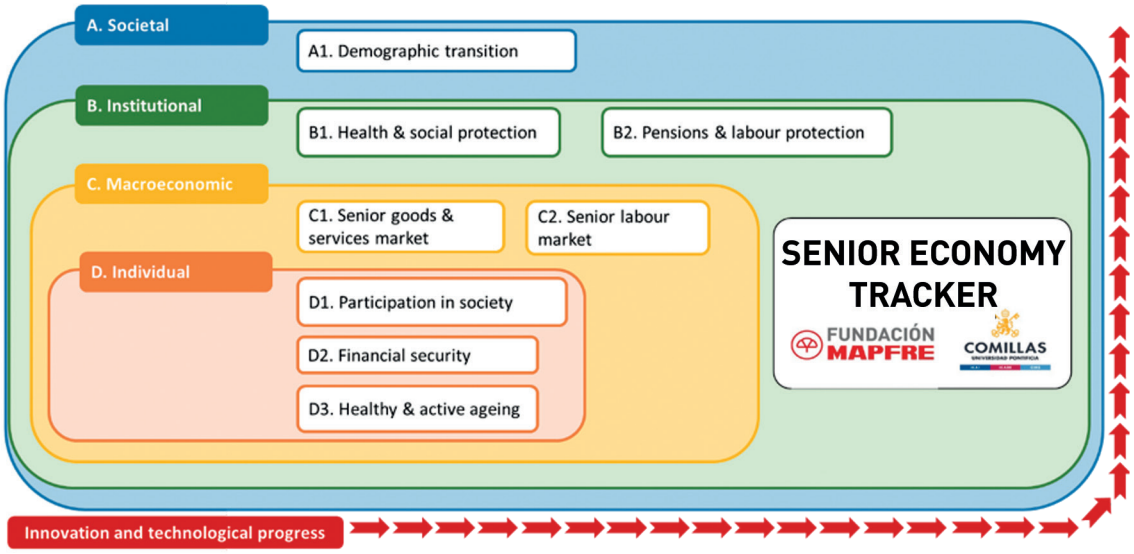
AGE THRESHOLD	ORGANIZATION/SOURCE
50+	World Health Organization (2019)
	Will population ageing spell the end of the Welfare State? A review of evidence and policy options.
	EU Commission (2019)
	The silver economy. An Overview of the European Commission's Activities
	EU Commission (2018)
	The silver economy
60+	World Economic Forum (2016)
	The Silver Economy: How 21st-Century Longevity Can Create Markets, Jobs and Drive Economic Growth
	Organisation for Economic Cooperation and Development (OECD) and the Global Coalition on Aging (GCOA) (2014)
	The Silver Economy as a Pathway for Growth Insights from the OECD-GCOA Expert Consultation

Source: Authors.

1.3. Measuring the Longevity Economy: The Senior Economy Tracker

There are different international indices related to economy and longevity: for example, the European Active Ageing Index, on quality of life, inspired by the WHO, or the Shift Index on inclusion and longevity (The Economist). However, none of them provide a comprehensive view of the longevity economy. The Senior Economy Tracker offers a holistic view derived from an analytical framework for the longevity, economy based on several interrelated dimensions (Figure 6). The dimensions of the Senior Economy Tracker allow us to conceptualize the longevity economy from the most general to the most particular, including the social, institutional, macroeconomic and individual dimensions. In turn, these dimensions can be understood as challenges, that is, the social, institutional, macroeconomic and individual challenge associated with longevity. Technological advances and innovation permeate each of these dimensions or challenges.

Figure 6. The Senior Economy Tracker: Structure



Source: Authors.

To facilitate reading and interpretation, we use a color code to differentiate the levels of analysis. Following the sequence from the outside in:

- The *social* dimension is the most general level, representing the demographic transition. In particular, the demographic challenge is associated with the potential pressure of population ageing on health systems, public finances and intergenerational equity.

- Faced with this challenge, society and governments must promote changes and innovations at *the institutional* level included in the categories associated with health and social protection, and pensions and labor protection, respectively. These categories present the institutional response to the potential problem of health pressure (e.g., through preventive health programs) and public pension coverage (e.g., flexible retirement structures).

- These institutional transformations can promote changes at *the macroeconomic* level, as shown in the next level in Figure 6. The methodology presents the macroeconomic dimension categorized into 'senior goods and services market' and 'senior labor market'.

- Finally, the *individual* level shows the contingencies and personal behaviors that promote, limit or condition the well-being of seniors. These include participation in society, financial security, and healthy, active aging.

The dimensions are vertically and horizontally interrelated, as is the case in all complex socio-economic systems. Each dimension is made up of different categories (A1, B1, B2, etc.) composed of different indicators. Table 2 shows the indicators included in each of the categories, specifying their sources (Eurostat or OECD).

Table 2. Base indicators included in each category of the Senior Economy Tracker

A. SOCIAL	
A1. Demographic transition	
A1.1 Median age of population (age)*	A1.4 Healthy life years (years)*
A1.2 Senior population (+55) as a proportion of total population (%)*	A1.5 Life expectancy above 55 years (years)*
A1.3 Life expectancy (years)**	A1.6 Old-age dependency ratio (ratio)*

B. INSTITUTIONAL	
B1. Health and social protection	**B2. Pensions and labour protection**
B1.1 Public-sector health expenditure (% of GDP)**	B2.1 Average annual old age pension (purchasing power standard) per inhabitant*
B1.2 Public expenditure on preventive medicine (% GDP)**	B2.2 Pensions beneficiaries (% of total population)*
B1.3 Density of workers in the health and social sector (number of workers in the health and social sector per thousand inhabitants)**	B2.3 Aggregate replacement ratio for pensions (Income earned after retirement relative to income earned before retirement)*
B1.4 Private health expenditure (% GDP)**	B2.4 Average effective age of retirement (age)**
	B2.5 Expected years in retirement (years)**
	B2.6 Personal pension schemes (% of GDP invested in personal pension funds, per 100)**
	B2.7 Pension funds (autonomous) (% GDP employers' contributions to pension funds)**
	B2.8 Pensioners' risk of poverty (% of people with a disposable income below 60% of the national average income)*

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Table 2. Base indicators included in each category of the Senior Economy Tracker

C. MACROECONOMIC	
C1. Senior Goods & Services Market C1.1 Senior consumption*	**C2. Senior Labour Market** C2.1 Duration of working life (years)* C2.2 Transition from unemployment to employment (ratio)* C2.3 Employed seniors working from home (55+) (% of total employed +55)* C2.4 Senior Employment Rate (55-64)* C2.5 Senior self-employed (55-74) (both per million)*
D. INDIVIDUAL	
D1. Social participation D1.1 Persons who cannot afford to spend a small amount each week on themselves (55+) (% of senior population)* D1.2 Persons who cannot afford to regularly participate in leisure (% of senior population)* D1.3 Persons who cannot afford to get-together with friends or family for a drink or meal at least once a month (% of senior population)* D1.4 Income inequality for older people (65+)* D1.5 Persons who cannot afford internet connection for personal use (% of senior population)* D1.6 Independent and autonomous living. One adult over 65 (% of Senior Population)* D1.7 Independent and autonomous living. 2 adults over 65 (% of senior population)* D1.8 Participation rate in education and training (50-74) (% of senior population)* D1.9 Individuals frequency of internet use (+55) (% of Senior Population)* D10. Political participation	**D2. Financial Security** D2.1 Relative median income ratio (+60) (€ Senior/€ Total population)* D2.2 Absence of risk-of-poverty (+55) (% senior population)* D2.3 Absence of severe material deprivation (+65) (% senior population)* D2.4 Absence of energy poverty. Households 1 adult > 65 years (% senior population)* D2.5 Absence of energy poverty. Households 2 adults, at least 1 > 65 years old (% senior population)* D2.6 In-work at risk of poverty (+55) (% senior population)* D2.7 Inability to face unexpected financial expenses. Households 1 adult > 65 years (% senior population)* D2.8 Inability to face unexpected financial expenses. Households 2 adults, at least 1 > 65 years old (% senior population)* D2.9 Share of housing cost in disposable household income. Households 1 adult > 65 years (ratio)* D2.10 Share of housing cost in disposable household income. 2 adults, at least 1 > 65 years old (ratio)* D2.11 Housing cost overburden rate (+65) (% of senior population indebted>40% their income)* D2.12 Percentage of home ownership. Households 1 adult > 65 years (%)* D2.13 Percentage of home ownership. Households 2 adults, at least 1 > 65 years old (%)*
D3. Healthy and active ageing D3.1 Access to health services (+55) (% of senior population)* D3.2 Self-perception of very good or good health status (+55) (% of senior population)* D3.3 People having long-standing illness or health problem (+55) (% of senior population)* D3.4 Self-perception of absence of activity limitations due to disabilities (+55) (% of the senior population)* D3.5 Self-perception of absence of unmet medical care (+55) (% of senior population)* D3.6 Healthy life expectancy at age 65+ (years)* D3.7 Premature deaths due to exposure to fine particullate matter*	

*Source: EUROSTAT.
**Source: OECD.

The technical specification of the methodology for measuring the longevity economy is inspired by the following principles:

- **Current**: its different dimensions can be measured with current indicators, although historical series are also available.
- **Generalizable/Universal**: valid and generalizable for different geographical and temporal contexts.
- **Extensible**: dimensions can incorporate future conjunctural, structural or regulatory patterns that can be evaluated in the measurement of the longevity economy.
- **Interdisciplinary**: includes dimensions and variables associated with different fields of study, so that the information provided by this methodology is sensitive to variations in different areas of economic and social reality.
- **Extra-financial nature**: due to its interdisciplinary nature, it includes financial, economic and extra-financial indicators, as the variation of the latter influences the evolution of the first two.
- **Global/Holistic**: due to the interdisciplinary approach, the proposed methodology allows the study of the longevity economy in a holistic way, avoiding partial perspectives such as the exclusive focus on the demand for goods and services (commonly referred to as the "silver market").
- **No double accounting**: the methodology avoids double accounting between indicators belonging to different fields.
- **Open access**: it can be calculated from public information or easily accessible.
- **Multidimensional**: to capture aggregate economic activity and the conditions that describe the longevity economy, we use a broad set of variables.
- **Inclusive**: capturing possible shortcomings or adverse effects on the most disadvantaged.
- **Comparable**: the indicator's results can be compared across countries or regions.
- **System-focused**: the methodology is presented as a system of several interrelated dimensions, so its representativeness would decrease if each dimension were measured separately.

In sum, the Senior Economy Tracker consists of four dimensions related to society, institutions, markets and people. Specifically, the dimensions are denominated: Social (A), Institutional (B), Macroeconomic (C, and Individual (D). These dimensions are omposed by different categories, which in turn are fed by baseline indicators obtained from public databases. The aggregation and normalization techniques are specified in the methodological guide, including the final correction criterion and the overweight of the macroeconomic dimension relative to the others. This overweight lies in the focus of the Ageingnomics Research Centre on the silver economy, which, by its nature, generates significant indirect or second-round effects on the other dimensions. However, we offer a sensitivity analysis quantifying the possible outcomes with different weights, including equal weighting scenarios. The Senior Economy Tracker takes values between 1 and 100. A higher indicator value indicates progress in moving towards the longevity economy.

2. The Senior Economy Tracker in Europe

2.1. Results by country

This section presents the results from the Senior Economy Tracker methodology (see Methodological Guide in Annex I). The Senior Economy Tracker draws on publicly accessible data (Eurostat and OECD), with Eurostat data being the majority, as can be seen in Table 2). Priority has been given to a selection of variables available in an open format, with frequent and continuous periodicity, over an extended period, and which are provided in the different countries under study. Table 3 shows the results of the Senior Economy Tracker in 27 European countries between 2005 and 2020. The selected countries include all EU members except Malta and Cyprus, due to their low representativeness and availability of data. In addition, Norway and the United Kingdom are included due to their proximity to EU countries and their relevance.

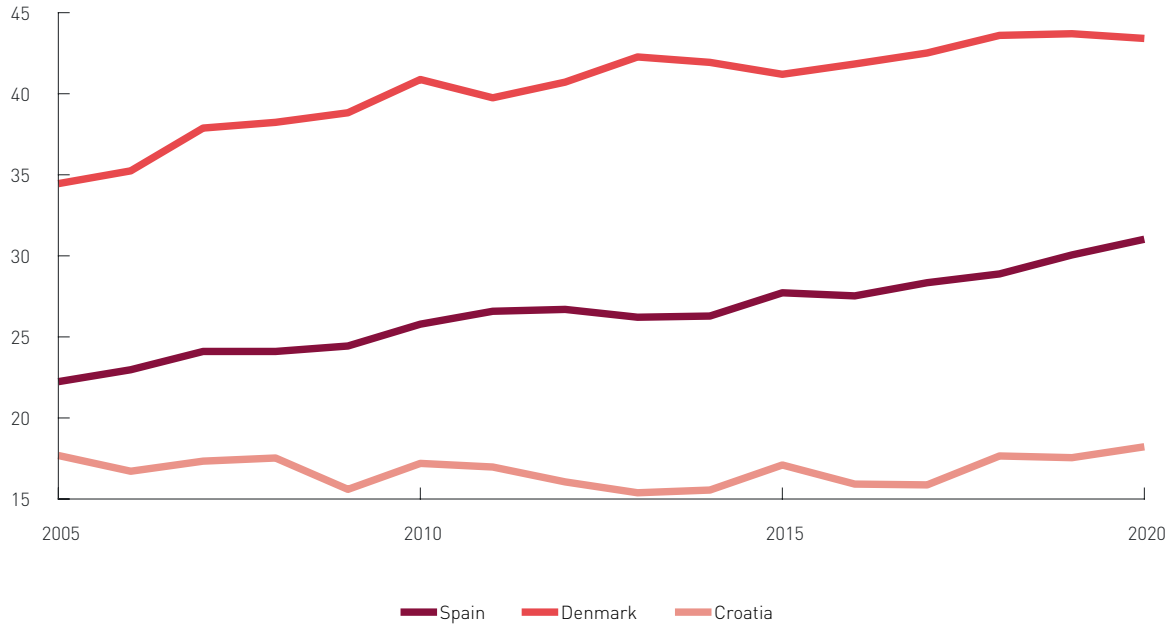
To illustrate the evolution of the most representative cases, three countries have been chosen with the best and worst evolution (Denmark and Croatia) as well as an average evolution (Spain) in the period 2005-2020 (Figure 7).

Table 3. Senior Economy Tracker results. Scores by country and year sorted according to results in 2020.

COUNTRY	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Denmark	34.45	35.24	37.88	38.24	38.83	40.88	39.75	40.72	42.27	41.93	41.20	41.84	42.51	43.60	43.70	43.41
Norway	34.49	35.06	37.69	38.99	39.37	38.20	37.33	41.06	40.86	41.23	42.46	41.27	41.69	43.41	44.64	43.27
Netherlands	35.03	34.10	35.09	36.08	36.06	37.80	36.94	37.59	38.15	38.23	40.46	39.98	41.73	41.97	42.26	42.91
Sweden	35.74	38.21	38.61	39.56	39.55	37.00	37.77	39.01	39.85	40.02	40.99	40.63	41.05	42.85	41.36	42.13
Finland	32.05	33.10	33.83	35.04	35.54	35.26	34.91	35.57	36.04	35.82	38.62	38.73	39.45	41.27	41.31	41.33
Austria	30.83	32.34	33.08	32.71	33.44	33.59	33.90	34.51	35.51	34.99	36.49	36.79	36.77	38.41	38.79	39.57
Luxembourg	24.22	24.75	25.68	25.73	34.77	34.67	33.38	33.60	33.86	36.63	35.64	29.73	36.68	35.50	37.46	38.98
UK	36.12	35.98	37.01	37.21	37.89	33.75	33.31	34.95	35.07	35.20	36.74	37.76	37.60	38.50	39.45	38.15
Germany	29.54	31.37	32.46	32.52	33.26	32.57	33.19	32.42	31.76	34.39	34.90	35.59	36.56	37.59	38.11	37.07
Ireland	34.98	34.09	35.48	36.59	36.60	37.43	36.97	35.57	34.87	34.17	34.45	35.53	35.68	35.64	37.09	36.03
France	30.73	32.00	31.48	32.63	33.21	32.90	32.62	32.91	32.56	33.05	34.59	34.24	34.38	35.06	34.66	35.52
Belgium	29.67	28.53	28.73	28.84	31.15	31.91	32.28	32.74	33.32	33.06	34.28	33.92	34.60	36.91	36.02	34.09
Italy	26.16	26.28	27.27	27.78	27.36	26.32	25.75	26.83	26.33	27.45	29.44	30.28	31.44	31.63	32.60	33.11
Portugal	26.75	27.09	26.97	28.36	29.24	29.60	29.64	29.11	28.76	27.74	30.01	30.59	31.08	31.79	32.54	32.27
Spain	22.24	22.97	24.10	24.10	24.44	25.79	26.58	26.70	26.21	26.29	27.72	27.53	28.34	28.89	30.06	31.02
Slovenia	22.72	21.52	22.78	22.87	22.96	23.50	23.57	23.70	26.20	24.80	23.41	25.23	25.99	27.80	26.82	29.18
Estonia	18.68	19.06	19.17	20.15	20.14	19.14	18.63	19.56	19.67	19.24	19.63	21.23	20.62	21.93	22.63	26.02
Greece	25.01	23.69	25.08	25.59	26.71	26.29	26.94	24.20	22.53	22.49	23.56	22.79	24.49	24.13	25.35	25.85
Czech Rep.	17.73	18.23	18.91	19.78	20.20	20.14	19.29	21.25	20.79	21.67	21.47	22.03	23.20	24.02	24.51	25.65
Hungary	16.71	16.17	16.11	15.99	16.33	19.25	18.59	18.82	19.93	20.30	21.13	22.39	22.00	23.15	22.54	25.34
Lithuania	15.91	16.11	17.16	17.76	16.50	19.36	19.15	17.45	20.49	20.56	21.53	21.40	22.13	23.74	22.91	23.17
Latvia	17.25	18.52	17.83	17.33	17.48	18.04	18.11	19.14	19.22	17.52	18.10	20.63	19.72	21.22	21.50	22.48
Poland	15.24	16.22	17.01	18.66	19.76	19.45	19.24	19.02	19.61	20.02	21.45	22.04	23.75	22.94	22.51	21.36
Slovakia	16.11	16.96	19.12	19.76	20.20	20.06	19.03	19.79	18.79	18.07	19.44	19.53	20.27	19.84	21.09	20.70
Bulgaria	12.14	12.14	12.55	13.72	12.96	15.25	15.36	16.54	16.00	17.40	17.49	18.19	18.40	18.85	19.49	19.62
Romania	9.63	9.61	10.00	11.23	11.99	16.39	14.52	14.75	14.72	14.25	14.36	15.09	16.75	17.59	17.79	19.52
Croatia	17.68	16.71	17.34	17.53	15.60	17.20	16.97	16.06	15.38	15.55	17.10	15.92	15.87	17.66	17.55	18.22

Source: Authors.

Figure 7. The Senior Economy Tracker over time. Selected countries with best, worst and average scores in 2020 (Denmark, Croatia and Spain, respectively)

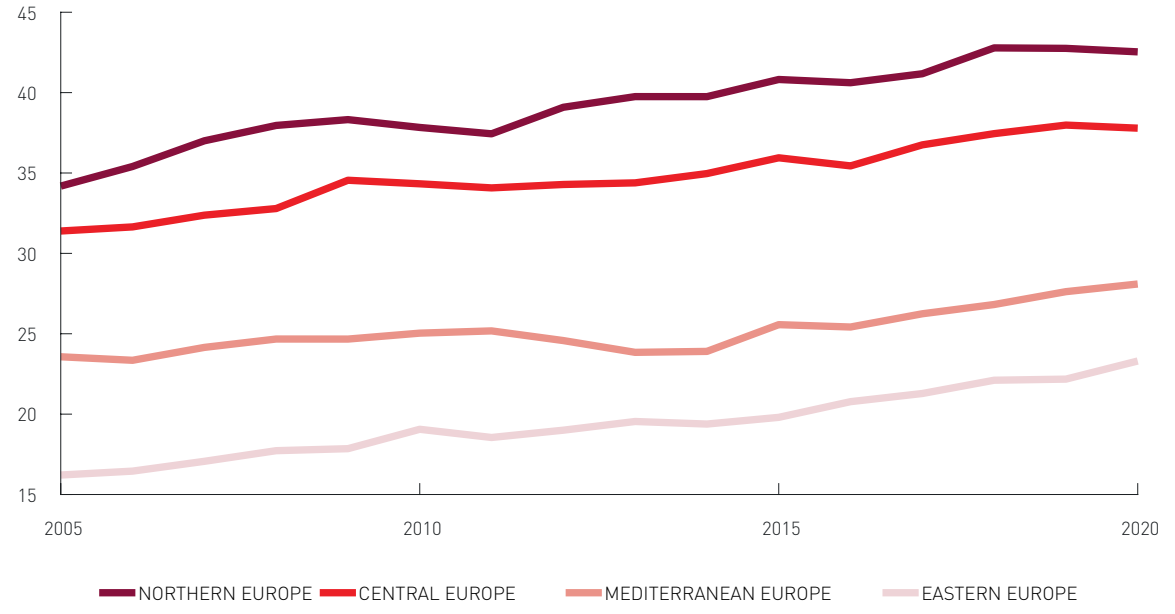


Source: Authors.

2.2. Aggregated results

Figure 8 shows the evolution of the Senior Economy Tracker by grouping countries into geographical areas representing Northern Europe, Central Europe, the Mediterranean and Eastern Europe. We observe that the countries of Northern Europe lead the advance of the longevity economy, while the countries of the East are lagging behind.

Figure 8. The Senior Economy Tracker over time in different regions of Europe

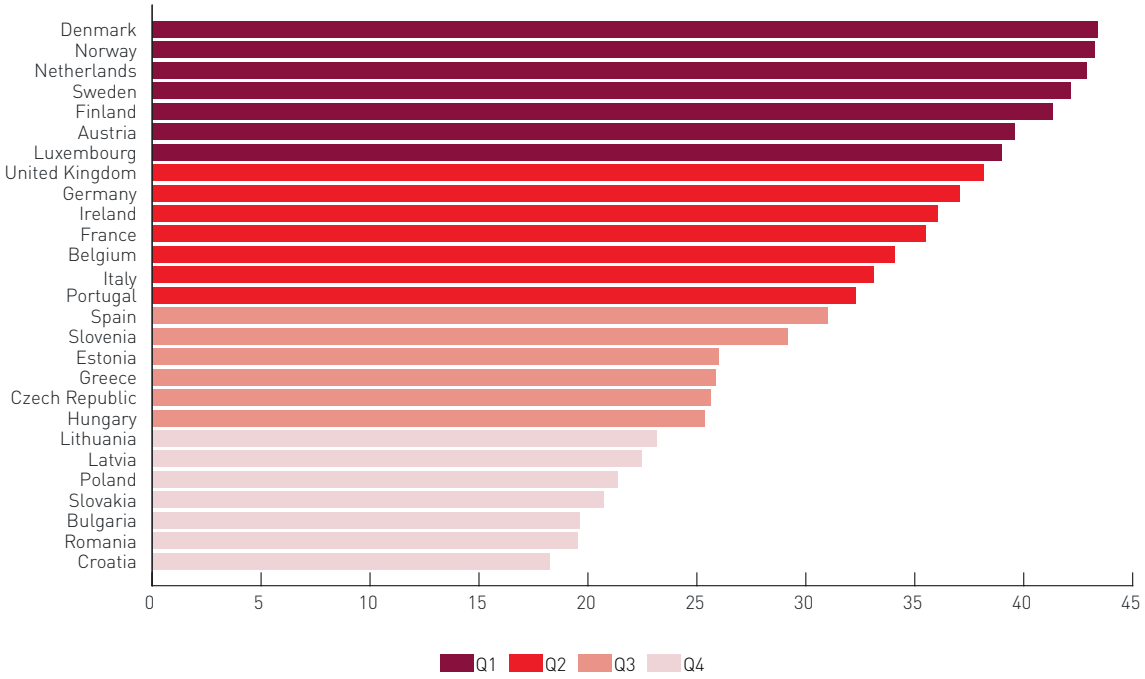


Source: Authors.

Figure 9 groups countries into quartiles based on the Senior Economy Tracker score in 2020. Denmark is a pioneer in progress towards the longevity economy, with a 2020 Tracker score of 43.41 points. It shares the first quartile with other Nordic countries such as Norway and Finland, which also stand out in their progress towards the longevity economy. The second quartile is led by the United Kingdom (38.15 points), and also includes Mediterranean countries such as France, Italy and Portugal (35.52, 33.1 and 32.27 points, respectively). In the third quartile we find Spain and Greece with a score of 31.02 and 25.85. Finally, the last quartile is mostly composed by Eastern European countries, with Croatia being the worst country in 2020 with 18.22 points.

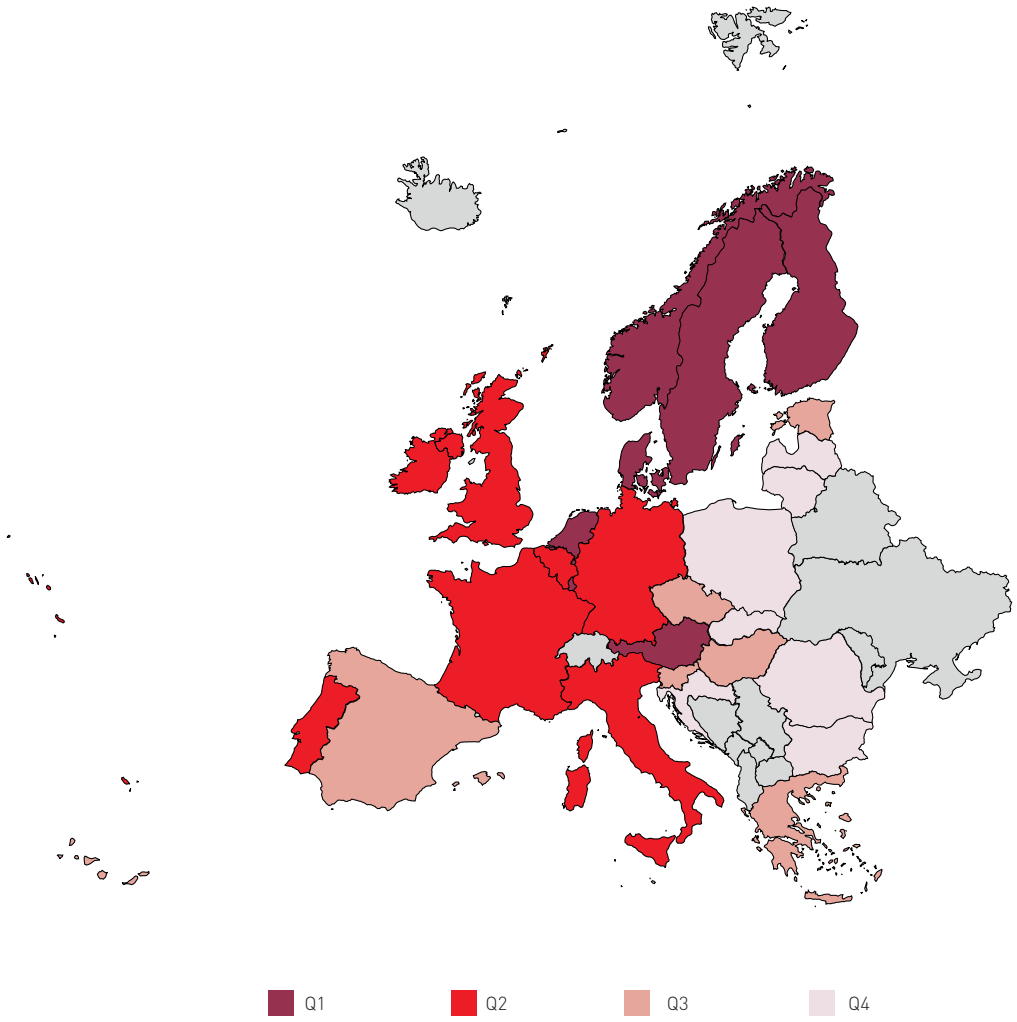
The 2020 Senior Economy Tracker scores are presented grouped by quartile on the Senior Economy Tracker map (Figure 10). We observe the leadership of the Scandinavian countries, followed by the Mediterranean countries, including Spain, which is in the third quartile.

Figure 9. Ranking of countries by quartile according to the Senior Economy Tracker scores (2020)



Source: Authors.

Figure 10. Geographic representation of longevity economy progress by quartiles based on the Senior Economy Tracker scores (2020)

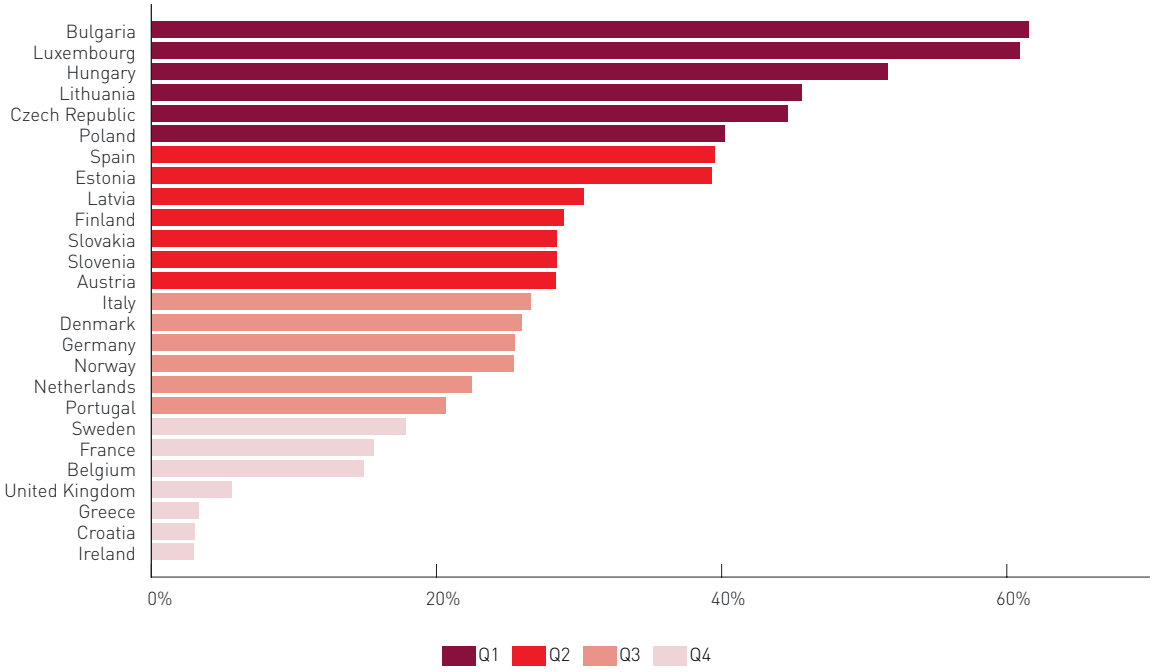


Source: Authors.

2.3. Evolution over time

Figure 11 shows the evolution of the Tracker between 2005 and 2020 by grouping countries by quartiles. We highlight countries whose Tracker score in 2005 is weak, which allows for higher percentage improvements. This is the case of Bulgaria, Luxembourg and Hungary, all in the first quartile. On the other hand, those countries that present a prominent position in the 2005 Tracker show lower growth throughout the period analyzed, as is the case of Ireland, which appears in the last quartile. Spain is in the second quartile, showing an improvement of 40% between 2005 and 2020.

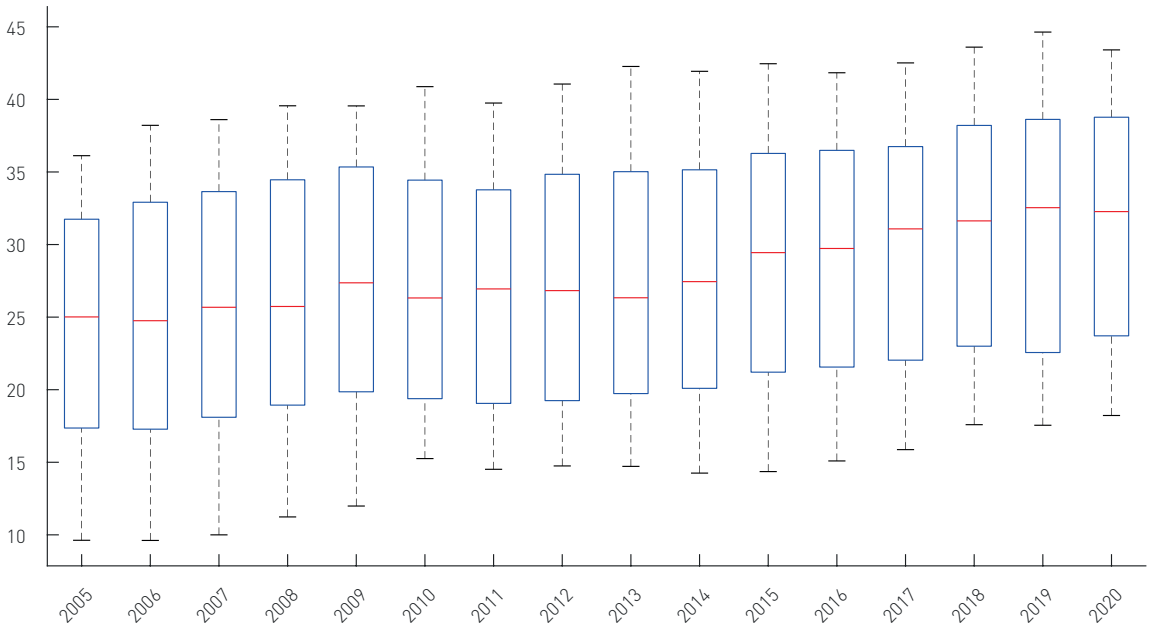
Figure 11. Rate of change of the Senior Economy Tracker (2005-2020). Classification of countries by quartile



*Note: Romania is not represented in this figure because it is an outlier (rate of change = 103%).
Source: Authors.

To analyse the evolution of the full sample in the period 2005-2020, we present a box plot (Figure 12) which allows to visualize and compare data trends and distribution by quartile. An upward trend is observed, i.e., continued improvements in the progress of the longevity economy for the sample as a whole, and less dispersion between countries.

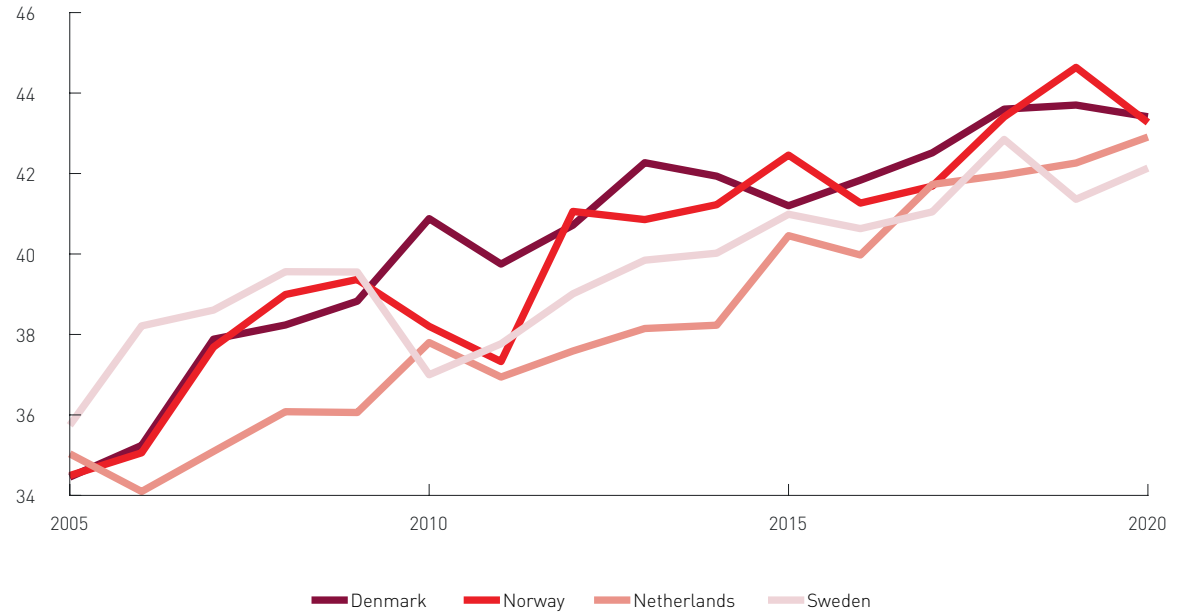
Figure 12. Evolution over time (2005-2020) of the Senior Economy Tracker scores for the entire sample of European countries



Source: Authors.

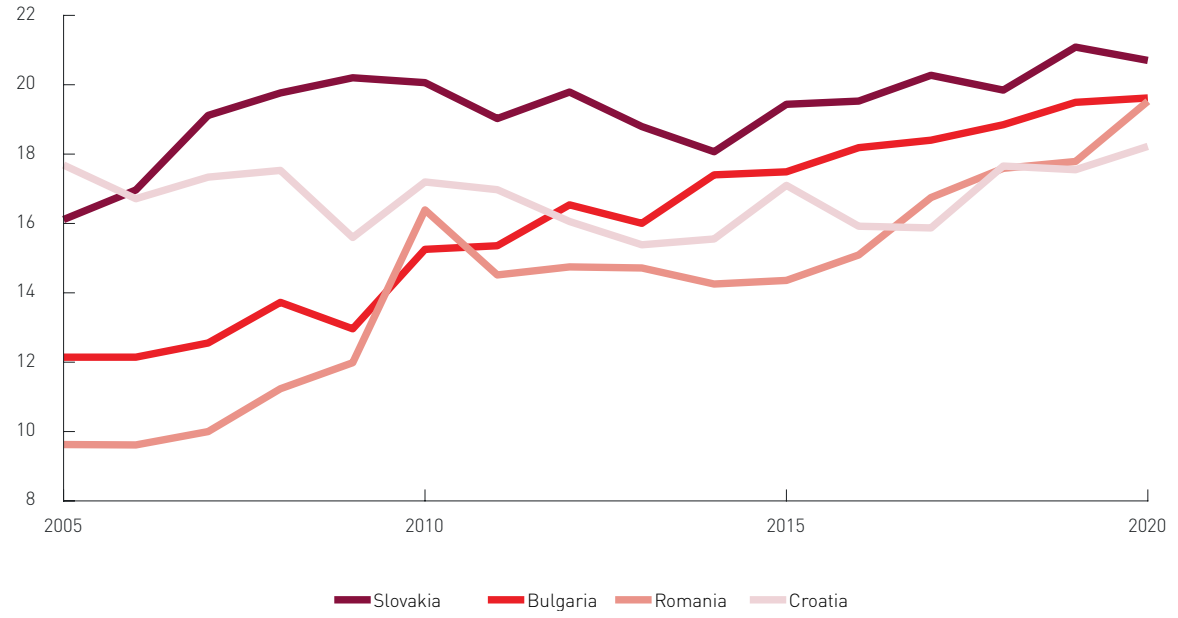
The evolution over time of the performance of the best countries in 2020 (Denmark, the Netherlands, Norway and Sweden) is shown in Figure 13. Similarly, Figure 14 presents the evolution over time of the countries that lagged the furthest behind in their Tracker score in 2020 (Slovakia, Romania, Bulgaria, Croatia).

Figure 13. Countries with the highest score in 2020. Evolution over time



Source: Authors.

Figure 14. Countries with lowest scores in 2020. Evolution over time

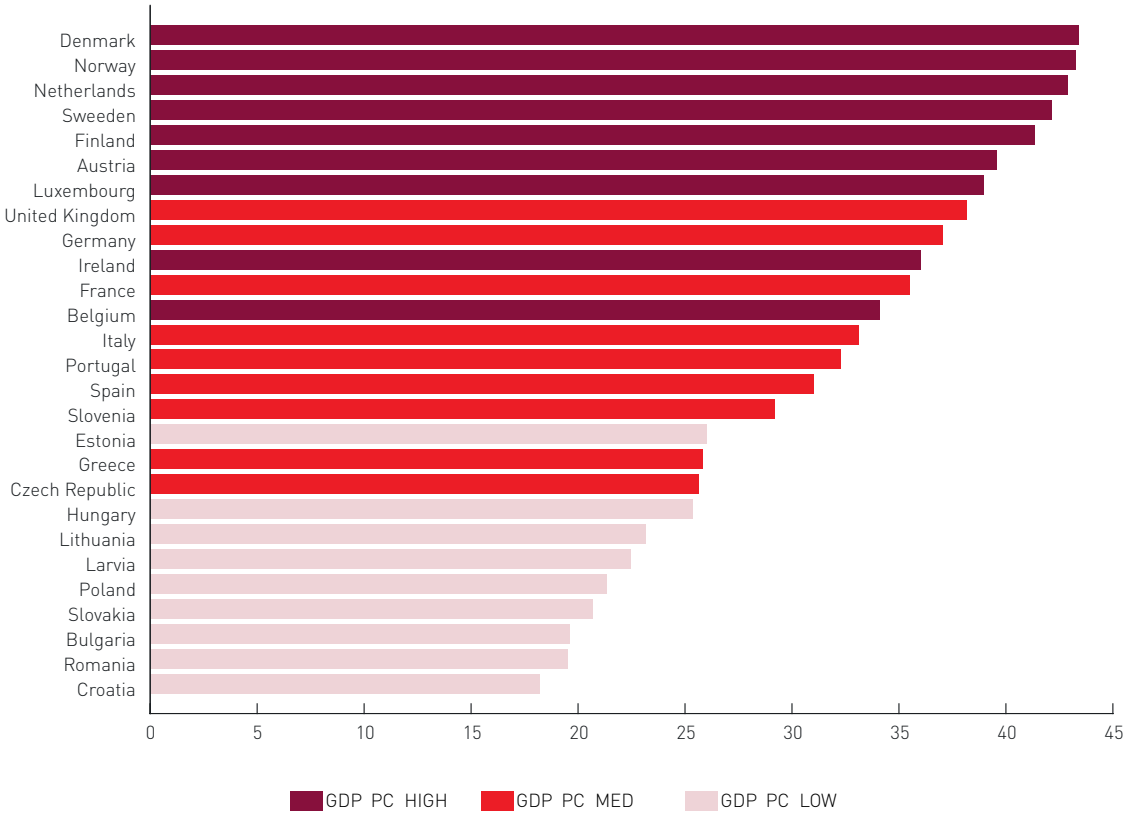


Source: Authors.

2.4. Results grouped by countries' economic power

To analyze the possible correlation between the Senior Economy Tracker and the evolution of the economy, Figure 15 shows scores in 2020 and countries grouped according to their GDP per capita levels (Eurostat). A correlation exists between countries with GDP per capita and Senior Economy Tracker scores, except for Ireland and Belgium (with scores below their GDP group) and Estonia (with scores above their GDP group). General correlations suggest a two-way relationship whose causality needs to be proved. That is, it could be argued that the advancement of the longevity economy may lead to greater economic development in terms of GDP per capita and/or that such greater development facilitates the advancement of the longevity economy.

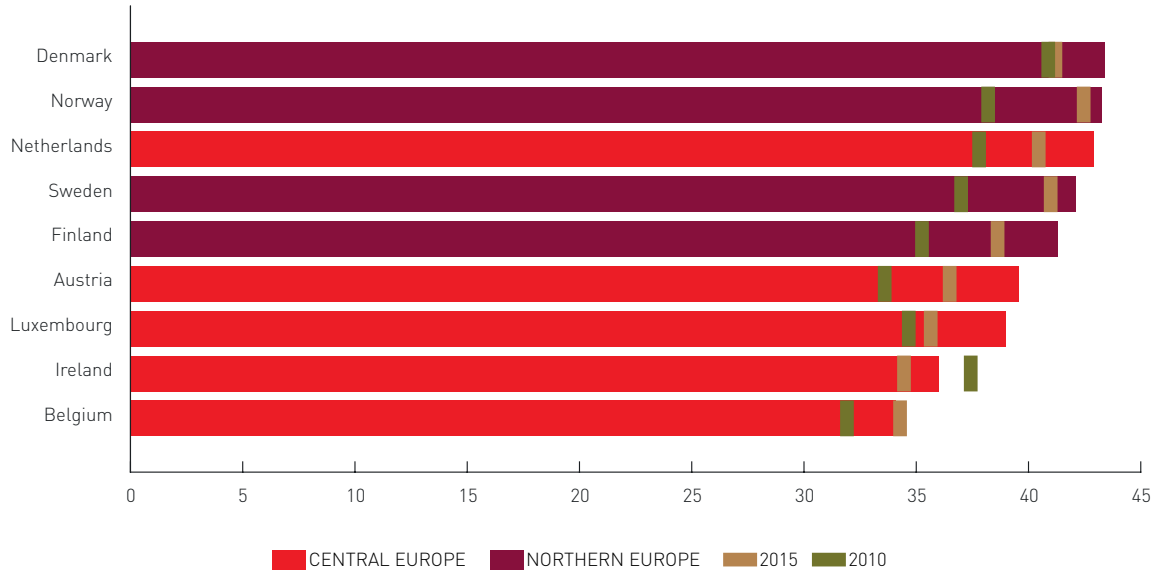
Figure 15. The Senior Economy Tracker ranking of countries grouped by GDP per capita (2020)



Source: Authors.

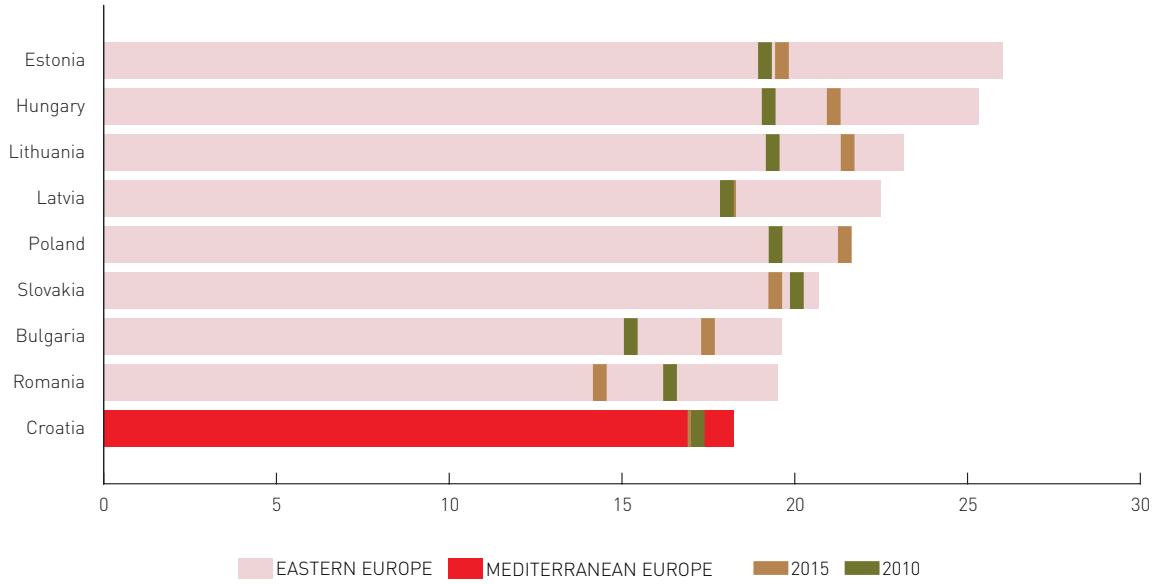
Going deeper into the analysis by economic capacity, Figure 16 ranks countries with high GDP per capita according to their score in 2020, 2015 and 2010 respectively, further grouping by geographical area. Once again, the condition of countries with high GDP per capita and located in Northern and Central Europe as leaders in the advancement of the longevity economy converges. Figure 17 and Figure 18 show the same analysis focused on countries with low and medium GDP per capita, respectively. The country with the lowest GDP per capita in the sample (Croatia) also presents the lowest score of the Senior Economy Tracker in 2020, thus endorsing previous results on the correlation between economic capacity and GDP per capita.

Figure 16. Senior Economy Tracker ranking of countries with a high GDP per capita grouped by region



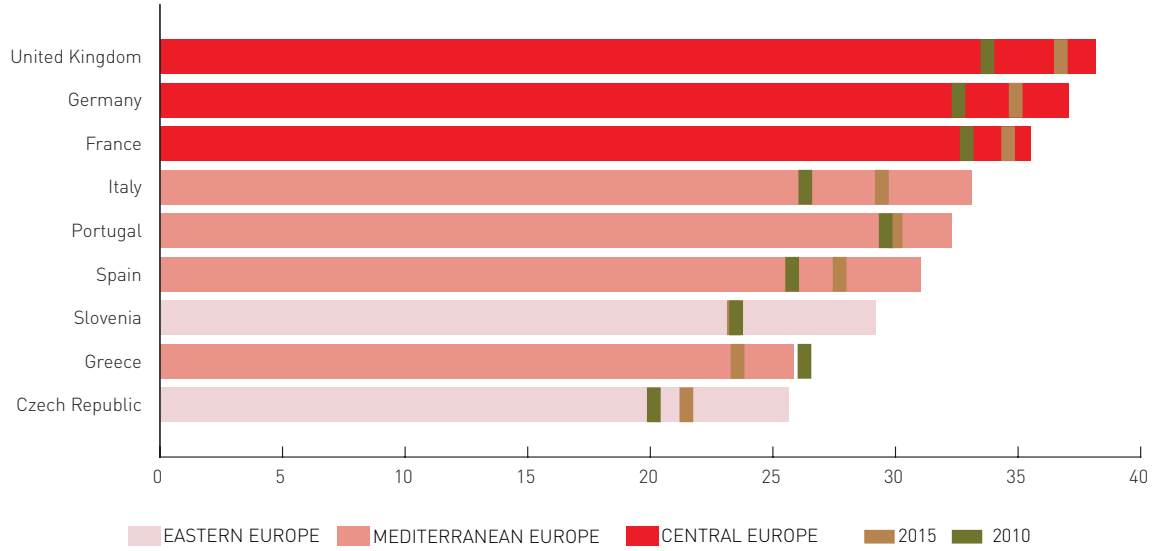
Note: 2020 in bars, 2015 and 2010 in lines.
Source: Authors.

Figure 17. Senior Economy Tracker ranking of countries with low GDP per capita grouped by region



Note: 2020 in bars, 2015 and 2010 in lines.
Source: Authors.

Figure 18. Senior Economy Tracker ranking of countries with an average GDP per capita grouped by region



Note: 2020 in bars, 2015 and 2010 in lines.
Souce: Authors.

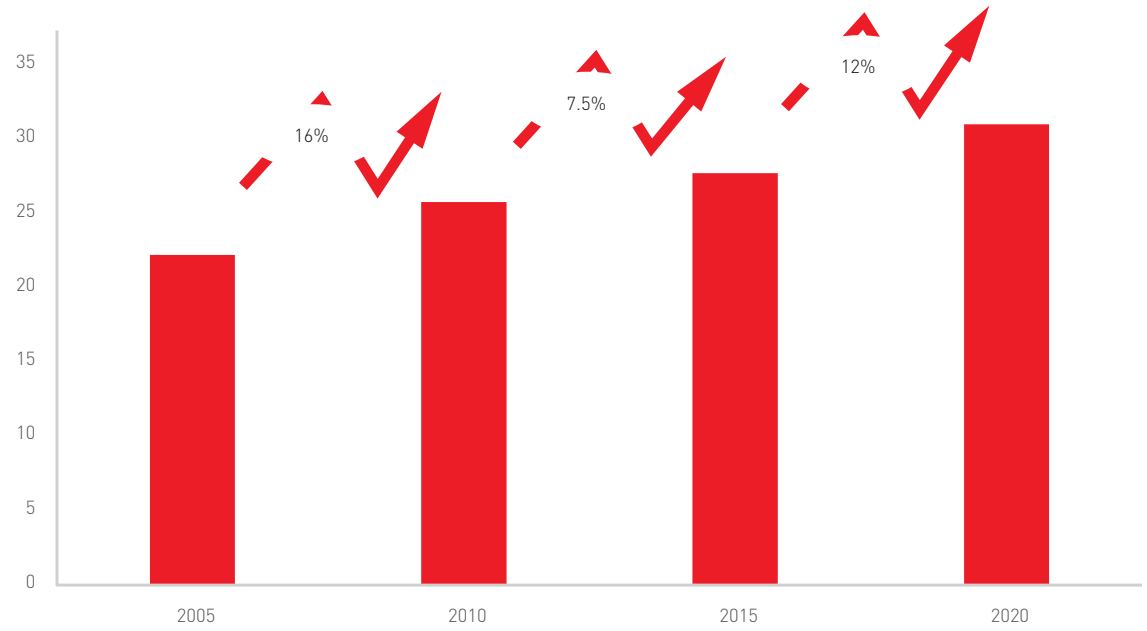
3. The Senior Economy Tracker in Spain

The historical evolution of the Senior Economy Tracker for Spain is reflected in Figure 19, which shows the Tracker score in four years (2005, 2010, 2015 and 2020) and its percentage evolution between those years. Growth of more than 10% was observed in all time windows except between 2010-2015 (6.5%), probably due to the economic difficulties associated with the financial crisis and the sovereign debt crisis.

The vertical axis shows the Senior Economy Tracker score. The bars show the Tracker score in the year indicated. The arrows show the percentage evolution of the Tracker between the selected years (2005-2010; 2010-2015; 2015-2020).

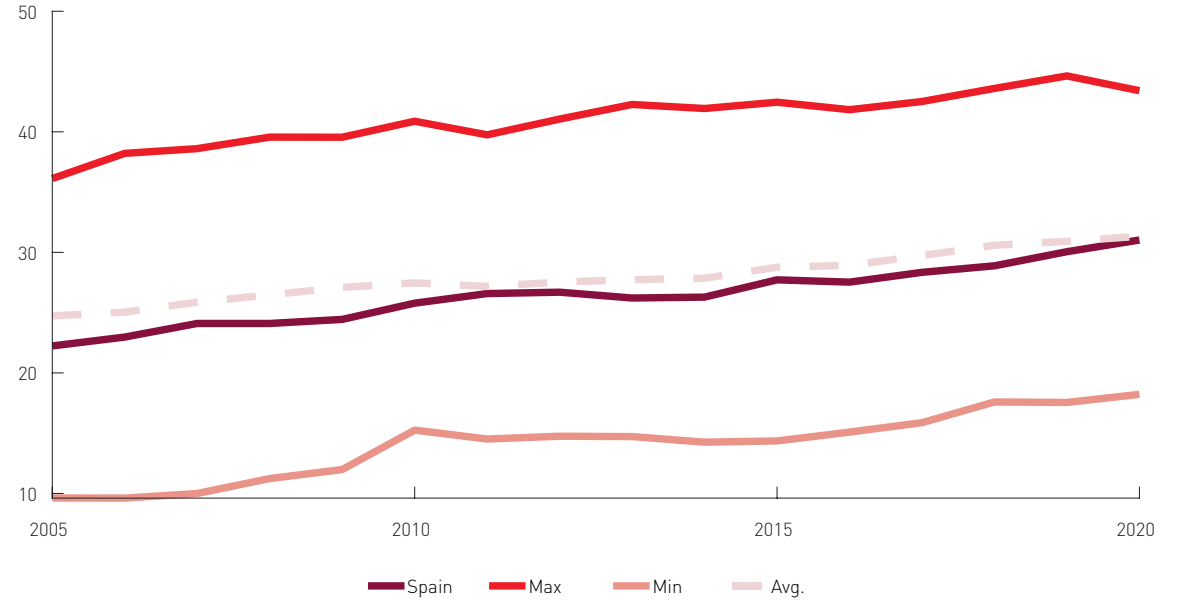
Figure 20 presents the evolution of Spain against the average of the European countries analyzed, and against the best and worst country in each of the years. The evolution of the Spanish economy is in line with the average of the countries analyzed.

Figure 19. The Senior Economy Tracker Spain. Evolution over time



Source: Authors.

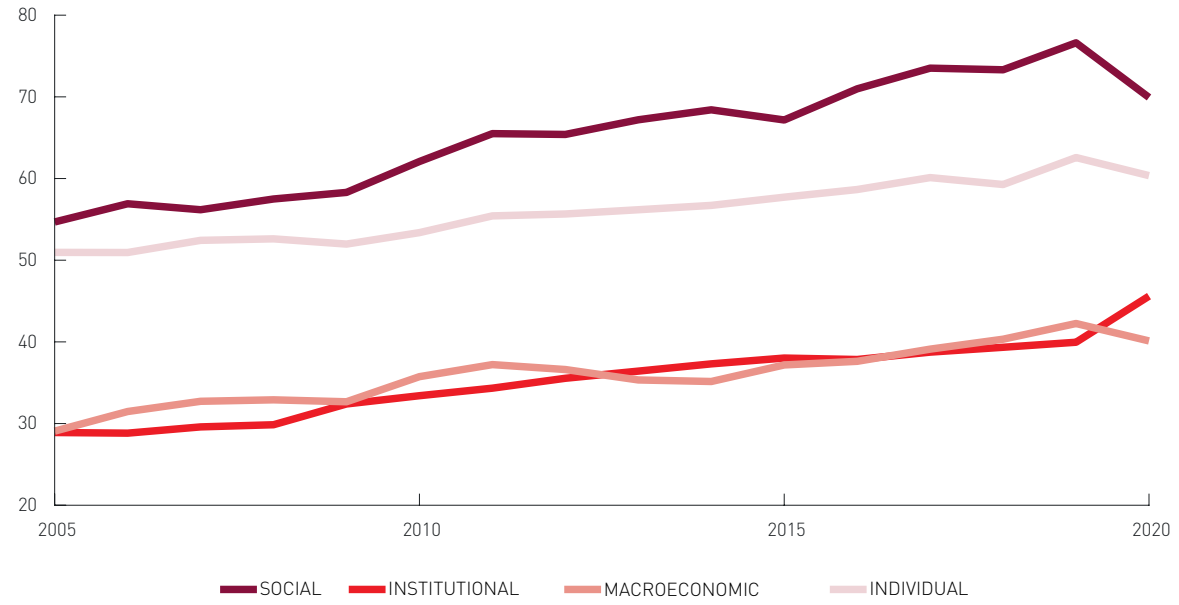
Figure 20. Spain's performance against the annual maximum, minimum and average of the Senior Economy Tracker



Source: Authors.

Finally, we proceed to analyze the progress of the longevity economy in Spain based on the different dimensions of the Tracker. Figure 21 shows the evolution of the four dimensions, social, institutional, macroeconomic and individual, over the study period. The demographic and individual dimensions present the highest scores, while the macroeconomic and institutional dimensions are below. This evidence allows to identify areas of action by public authorities, government institutions and the private sector.

Figure 21. Evolution of the dimensions of the Senior Economy Tracker in Spain over time

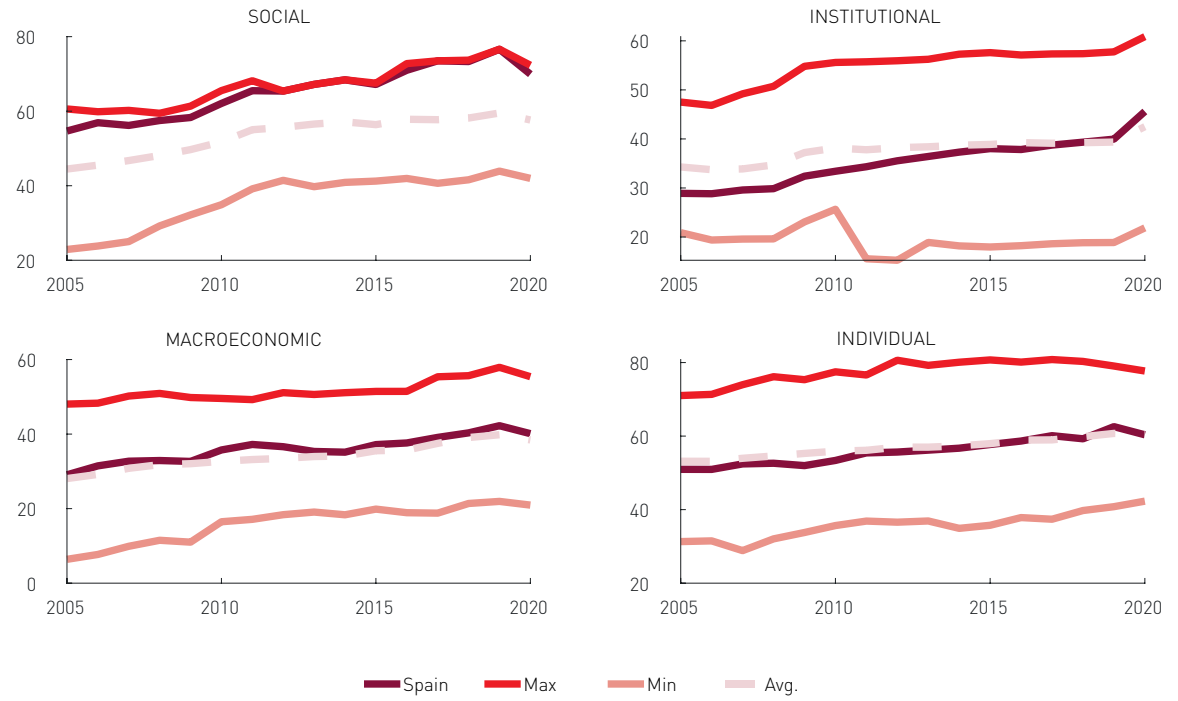


Source: Authors.

The results of the Senior Economy Tracker for each of the dimensions in Spain and their evolution against the average, maximums and minimums of the countries under study are presented below (Figure 22). The scores of dimensions A and D (social and individual) stand out, higher than those obtained in B and C (institutional and macroeconomic). These results have important implications for the formulation of economic policies to accelerate progress towards the longevity economy.

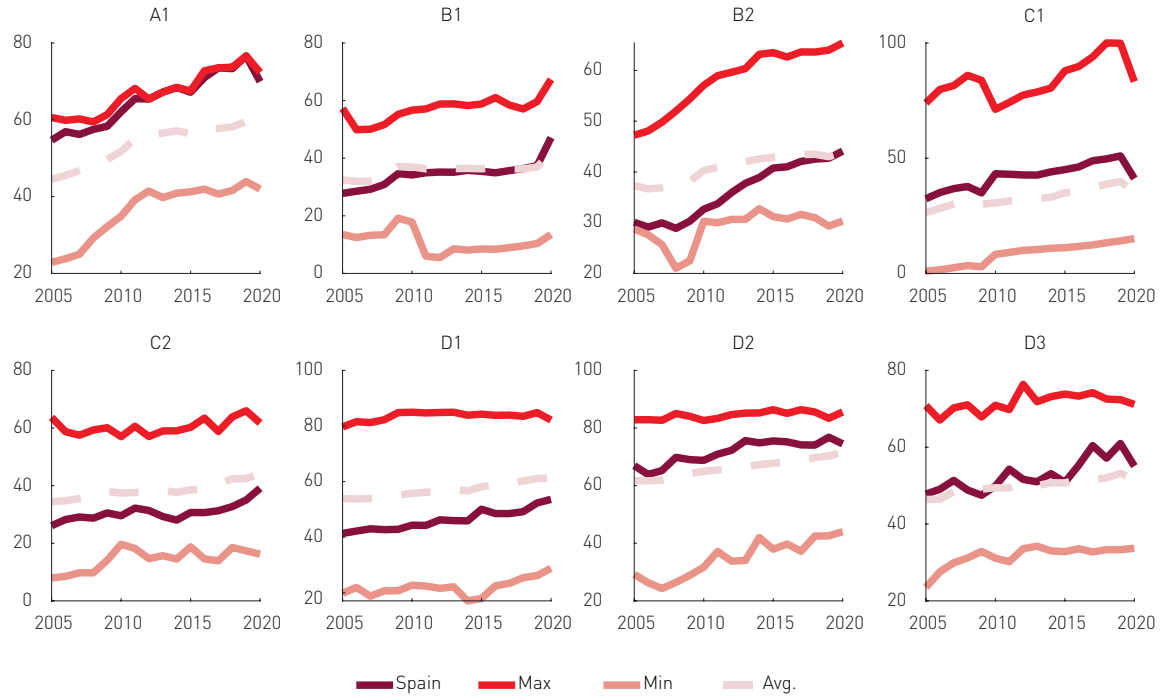
On the other hand, Figure 23 shows the evolution of Spain by category. The maximum position of the sample in A1 ('Demographic transition') and above the average in C1 ('Silver goods and services market') and D2 ('Financial security') is significant. Spain is very close to the average in B1 ('Health and social protection') and D3 ('Healthy and active life'), and in B2 ('Pensions and labour protection') at the end of the study period analyzed. The results in Spain stand out negatively, below the average, in C2 ('Silver Labour Market') and in D1 ('Participation in society').

Figure 22. Spain's performance against the annual maximum, minimum and average of the Senior Economy Tracker by dimensions



Source: Authors.

Figure 23. Evolution of the categories of the Senior Economy Tracker in Spain



Source: Authors.

4. The Senior Economy Tracker: multidimensional analysis

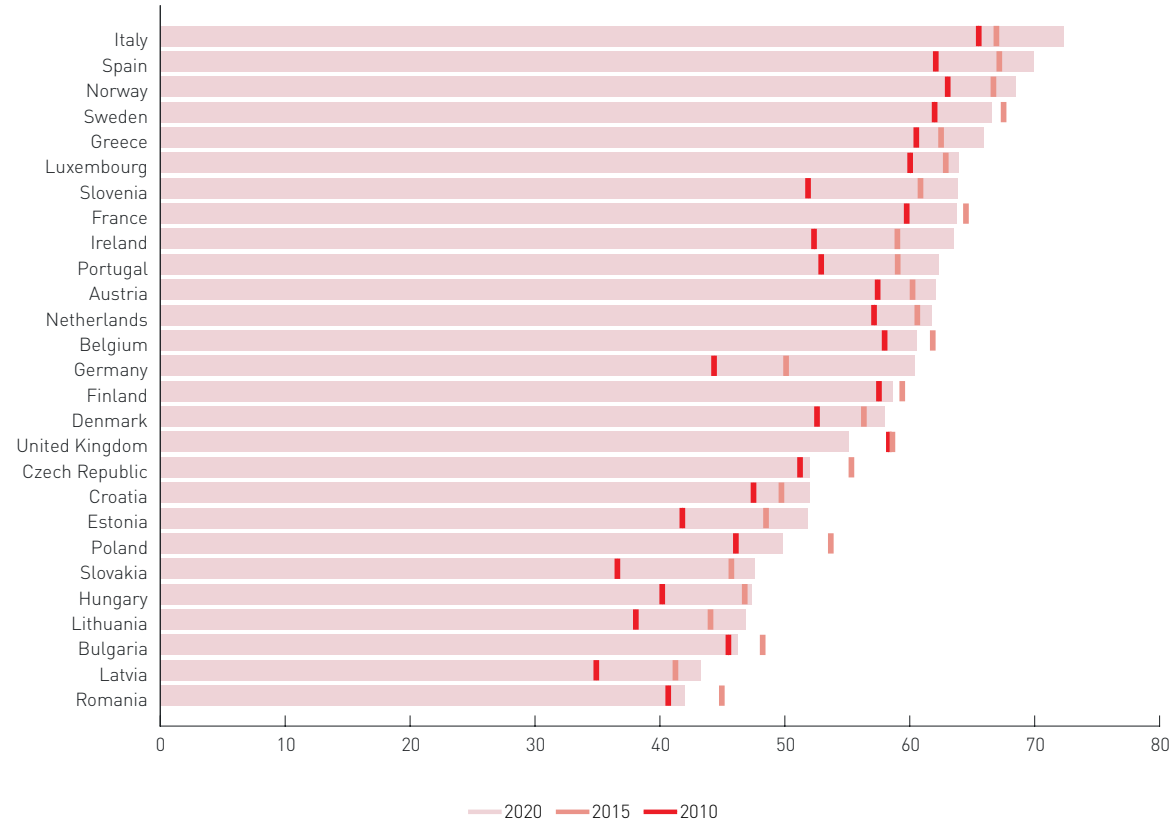
The Senior Economy Tracker is an aggregate indicator of several dimensions and categories (as shown in Figure 6). This configuration provides greater granularity to the indicator since it allows an in-depth analysis to unveil the reasons for a higher or lower score.

The following section details the results by dimension.

4.1. Dimension A: Social Challenge

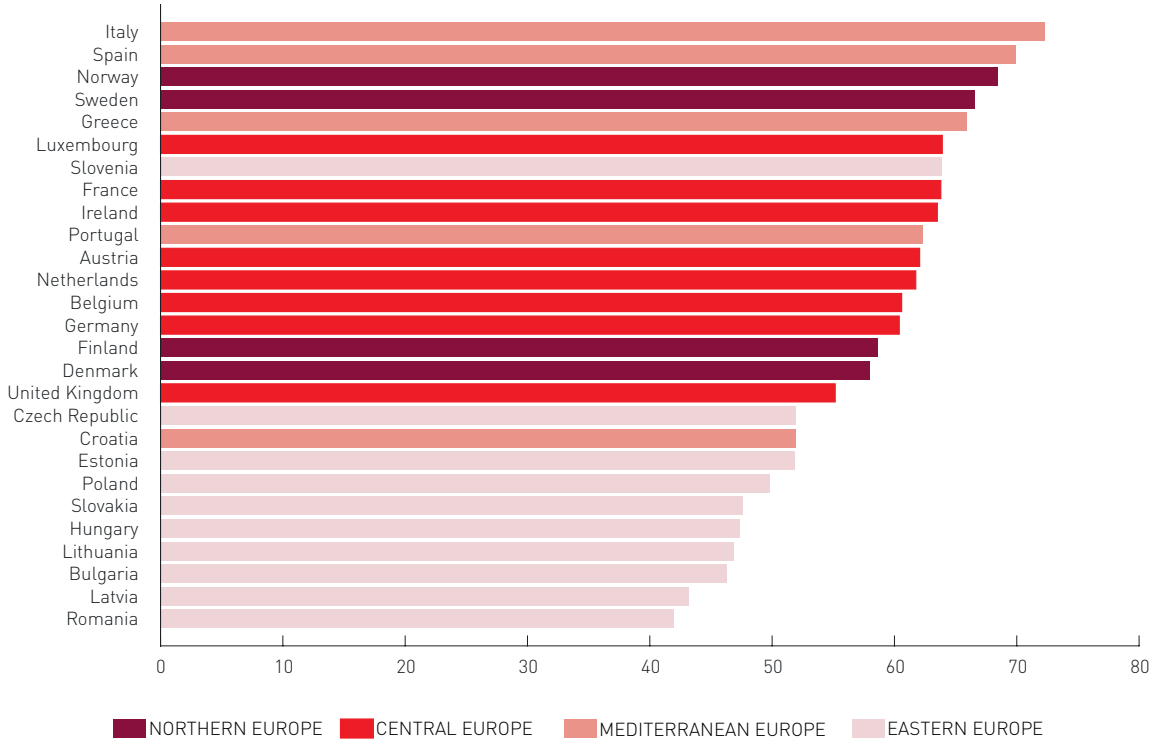
The social dimension or social challenge of the Senior Economy Tracker is composed of variables associated with the demographic transition. The following figures show the evolution of this dimension by country over time (Figure 24), by geographical area (Figure 25) and by level of economic development (Figure 26).

Figure 24. Evolution of the 'Social' dimension of the Senior Economy Tracker



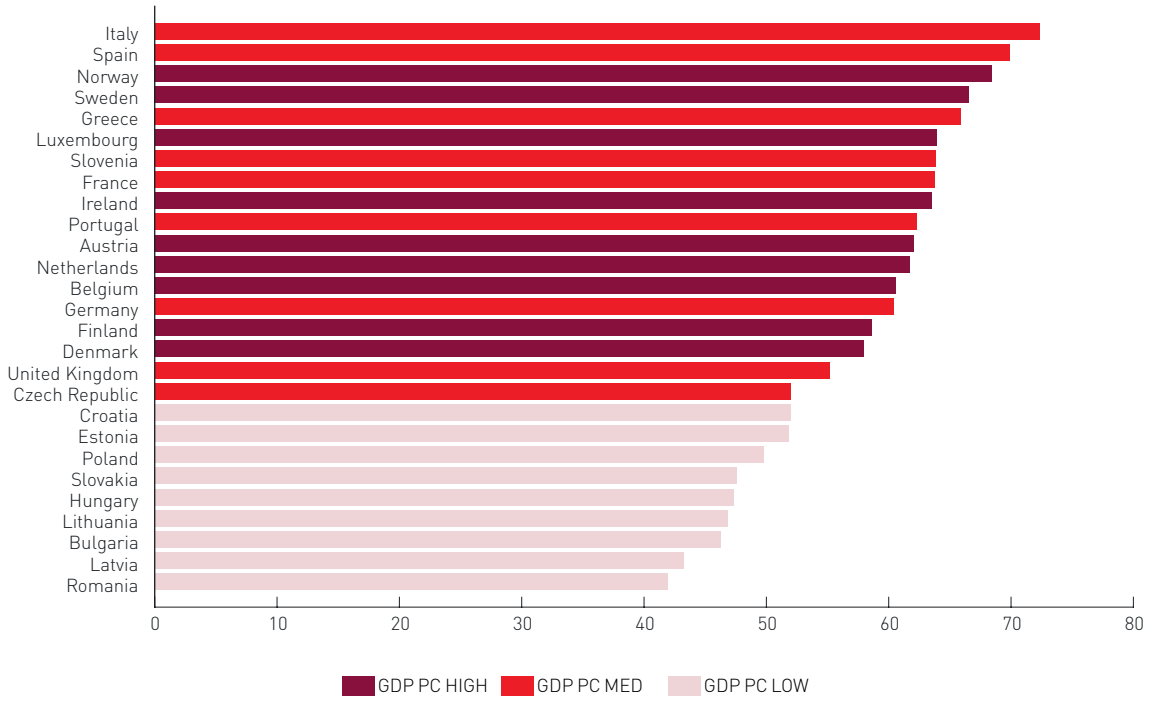
Source: Authors.

Figure 25. Dimension 'Social' from the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 26. 'Social' dimension of the Senior Economy Tracker by level of GDP per capita. 2020 Scores



Source: Authors.

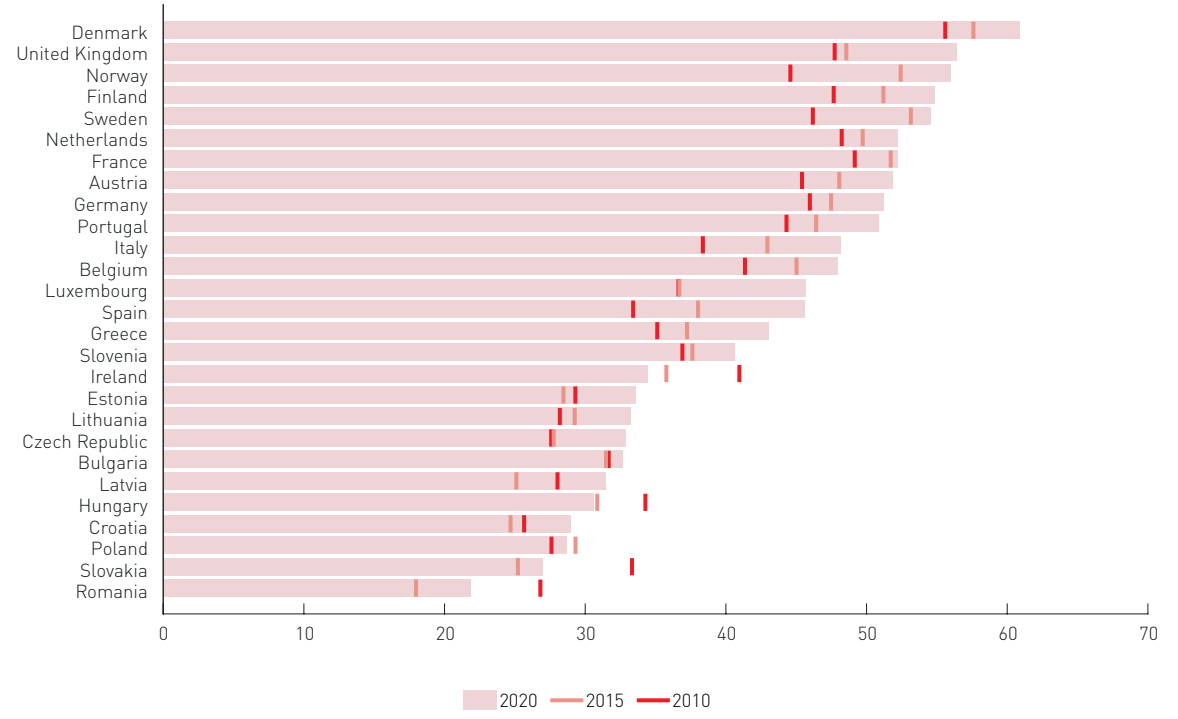
The social dimension in the Senior Economy Tracker, mainly composed of the demographic transition, shows the clear leadership of Italy in 2020 and Sweden in 2015 (Figure 24). In contrast, it is significant to note that nine countries present lower results in 2020 than in 2015 in this dimension, for example, Norway, the United Kingdom, and several Eastern European countries. By region, the countries of Mediterranean Europe stand out, particularly Italy and Spain (Figure 25). Finally, in the classification by levels of GDP per capita, the social dimension is led by countries with high and medium GDP per capita (Figure 26).

4.2. Dimension B: Institutional Challenge

The longevity economy presents important challenges related to institutional development, which evolve over time (Figure 27), as well as in relation to the geographical area (Figure 28), and the level of GDP per capita (Figure 29) of the countries under study.

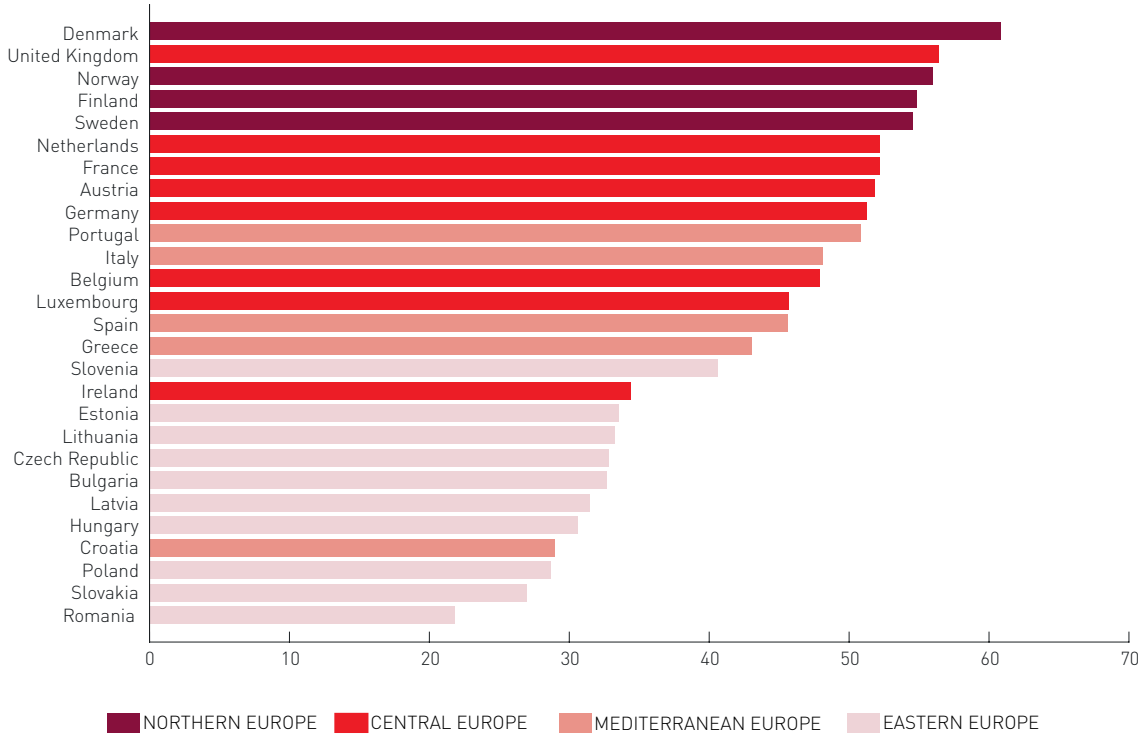
In contrast to the previous dimension, the Nordic countries (Denmark, Norway, Finland and Sweden) lead the results of the institutional dimension of the Senior Economy Tracker, along with the United Kingdom, with the Mediterranean countries relegated to intermediate positions. Denmark is the country with the best institutional quality in relation to the longevity economy, while Romania shows significant institutional deficits. In addition, the decline of Hungary, Ireland and Poland stands out, whose results in 2020 are lower than those of 2015 and 2010.

Figure 27. Evolution of the 'Institutional' dimension of the Senior Economy Tracker



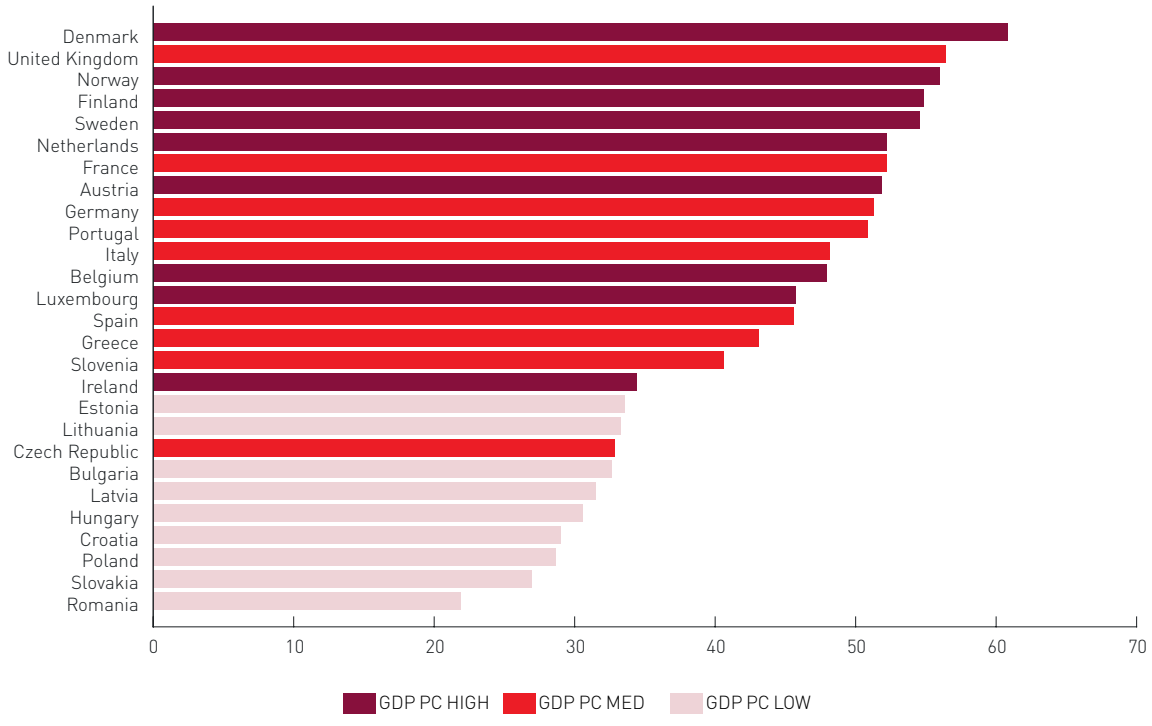
Source: Authors.

Figure 28. 'Institutional' dimension of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 29. 'Institutional' dimension of the Senior Economy Tracker by level of GDP per capita. 2020 Scores



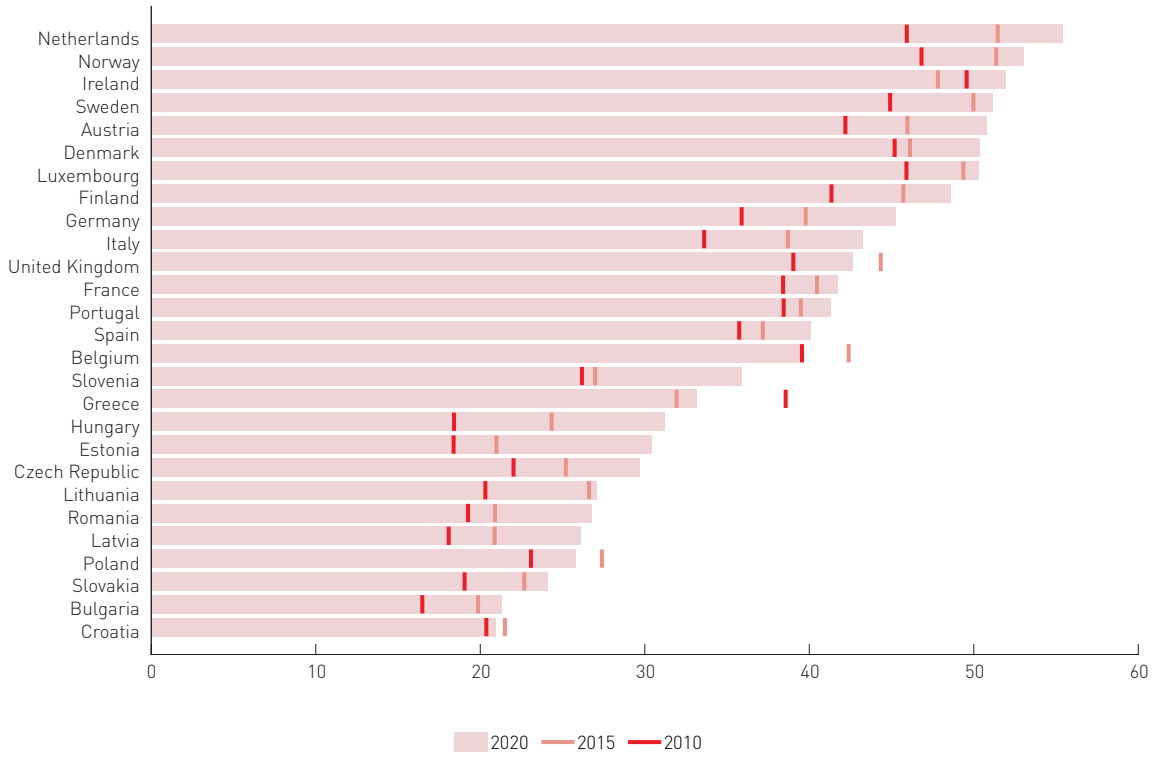
Source: Authors.

4.3. Dimension C: Macroeconomic Challenge

The macroeconomic challenges of the longevity economy represent the supply and demand generated by the effect of longer-lived societies. That is, the market for goods and services and job and entrepreneurship opportunities for seniors. Figure 30 shows the evolution of the macroeconomic dimension over time, while Figure 31 and Figure 32 analyze their evolution by region and level of economic development, respectively.

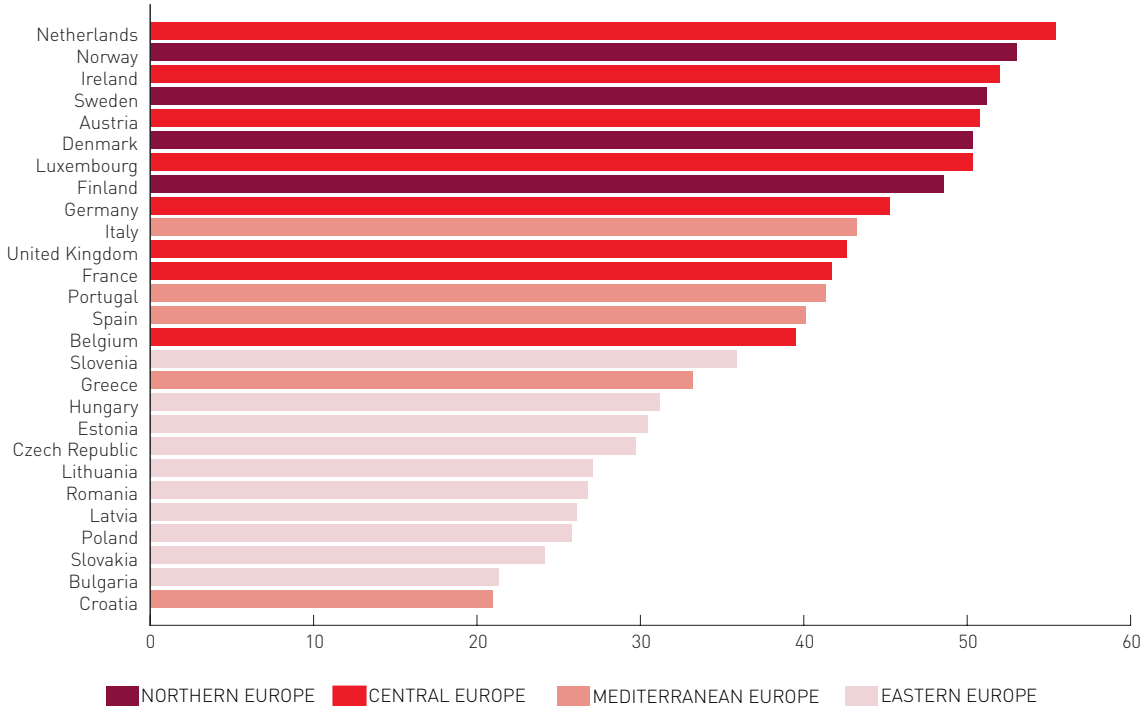
The macroeconomic dimension of the Senior Economy Tracker outperforms in the Netherlands, followed closely by Norway, Ireland and Sweden. Once again, Eastern European countries lag behind, as well as those with lower GDP per capita. Belgium is particularly noteworthy as a country which, despite belonging to the group of high GDP per capita, has a position below its group. In terms of time evolution, Belgium, Croatia, Poland and the United Kingdom regressed between 2015 and 2020. The category analysis in section 6 sheds light on this development.

Figure 30. Evolution of the 'Macroeconomic' dimension of the Senior Economy Tracker



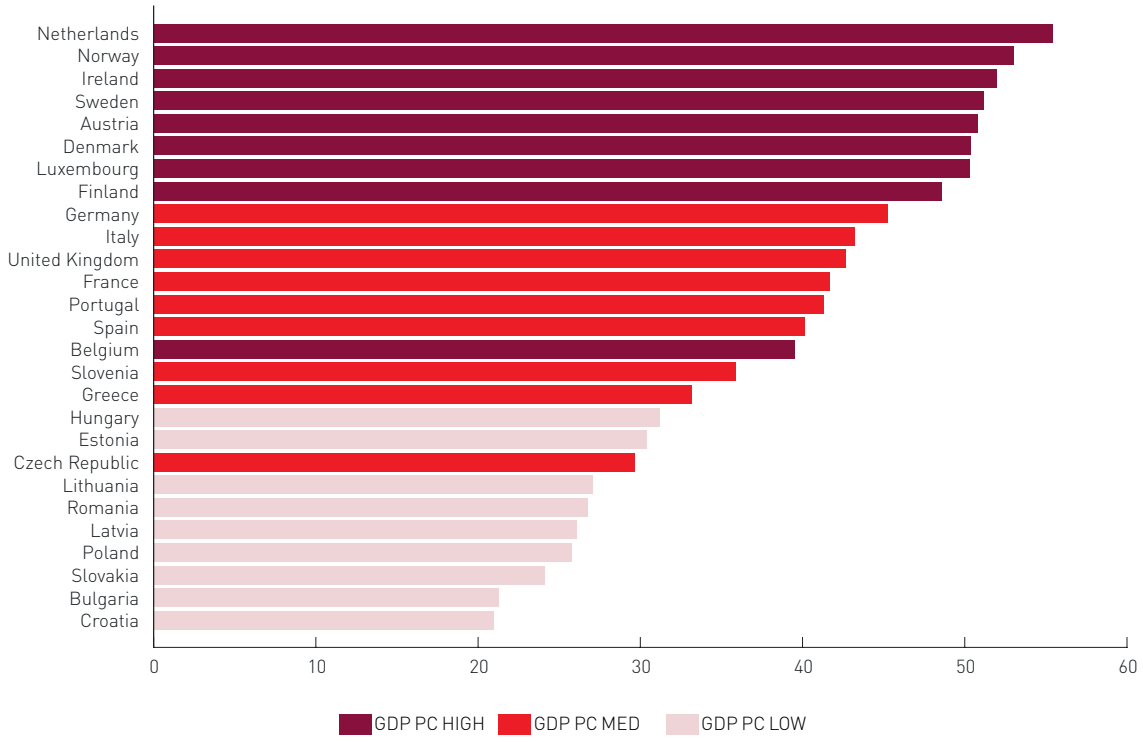
Source: Authors.

Figure 31. 'Macroeconomic' dimension of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 32. 'Macroeconomic' dimension of the Senior Economy Tracker by GDP per capita. 2020 Scores



Source: Authors.

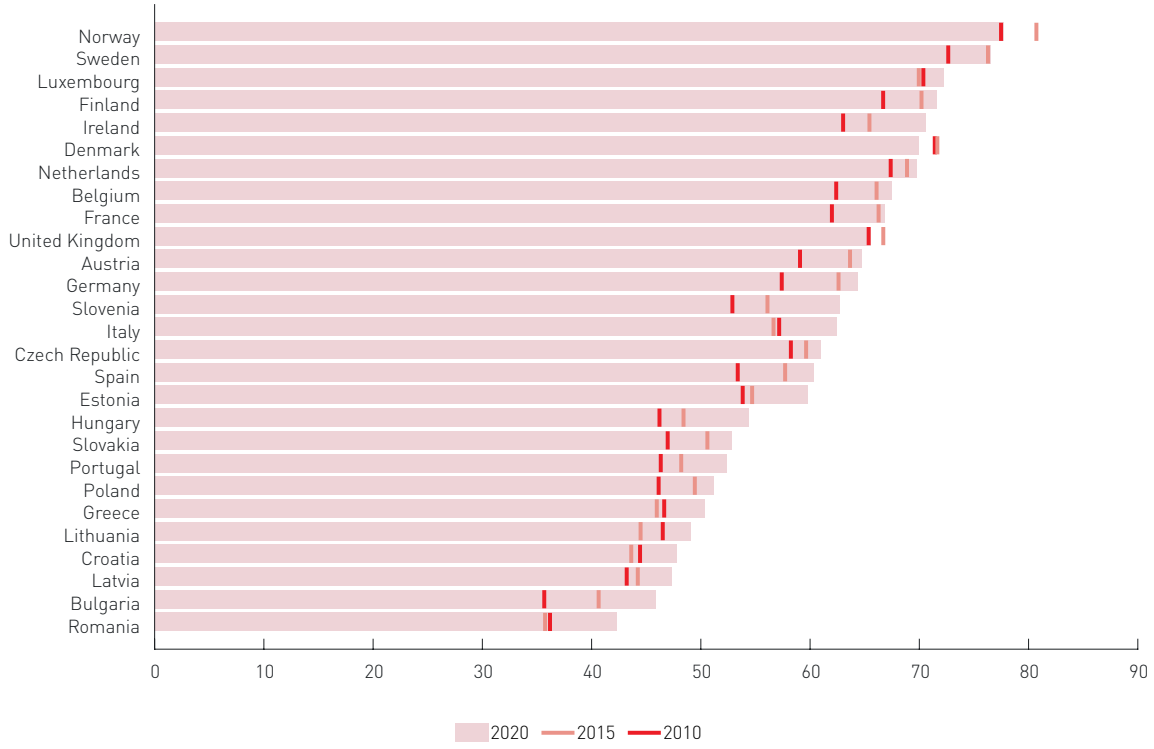
4.4. Dimension D: Individual Challenge

The individual dimension represents the challenges at the individual level that need to be addressed for the progress of the longevity economy, from the perspective of health, social and financial inclusion, among others. Figure 33 shows the evolution of this dimension in recent years. Analyses by geographical area and economic performance of countries are represented in Figure 34 and Figure 35.

Regarding the individual dimension of the Senior Economy Tracker, the leadership of the Nordic countries and those with a high GDP per capita is once again observed. It is significant that the leading country in this dimension, Norway, presented a decline in 2020 compared to its score in this same dimension in 2015. The same is true in Denmark and the United Kingdom. This may be due, among others, to the effects of the pandemic.

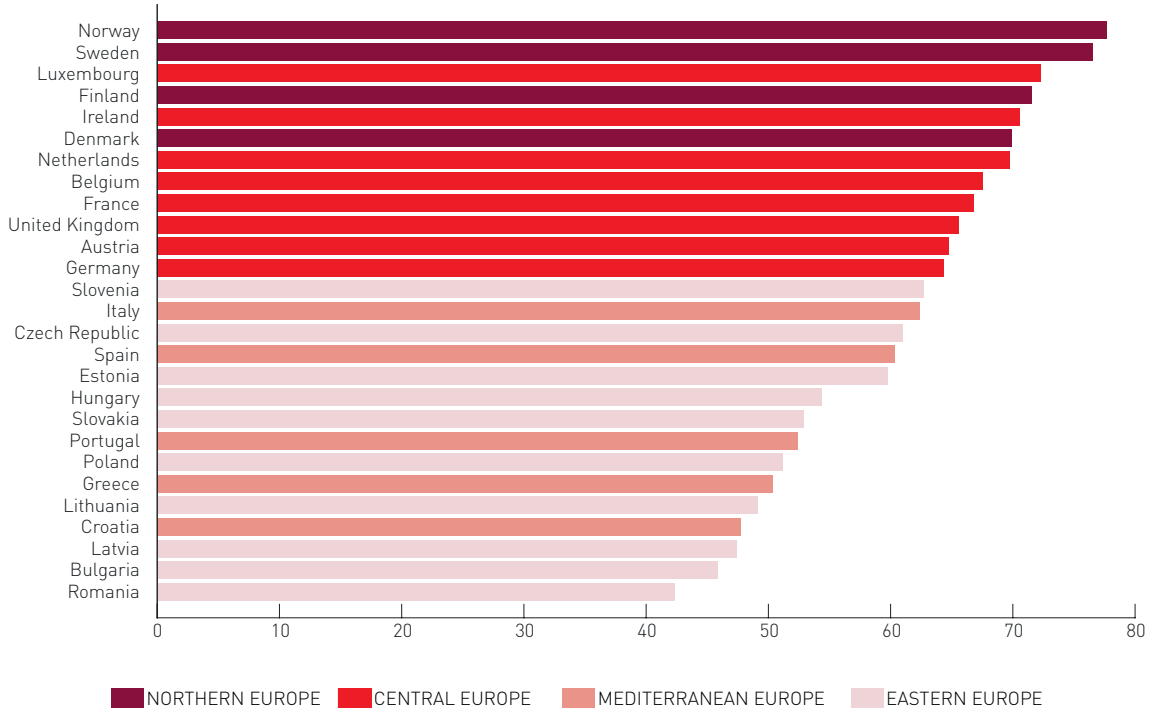
The following section specifically details the categories that explain the evolution by dimensions analyzed in this section.

Figure 33. Evolution of the 'Individual' dimension of the Senior Economy Tracker



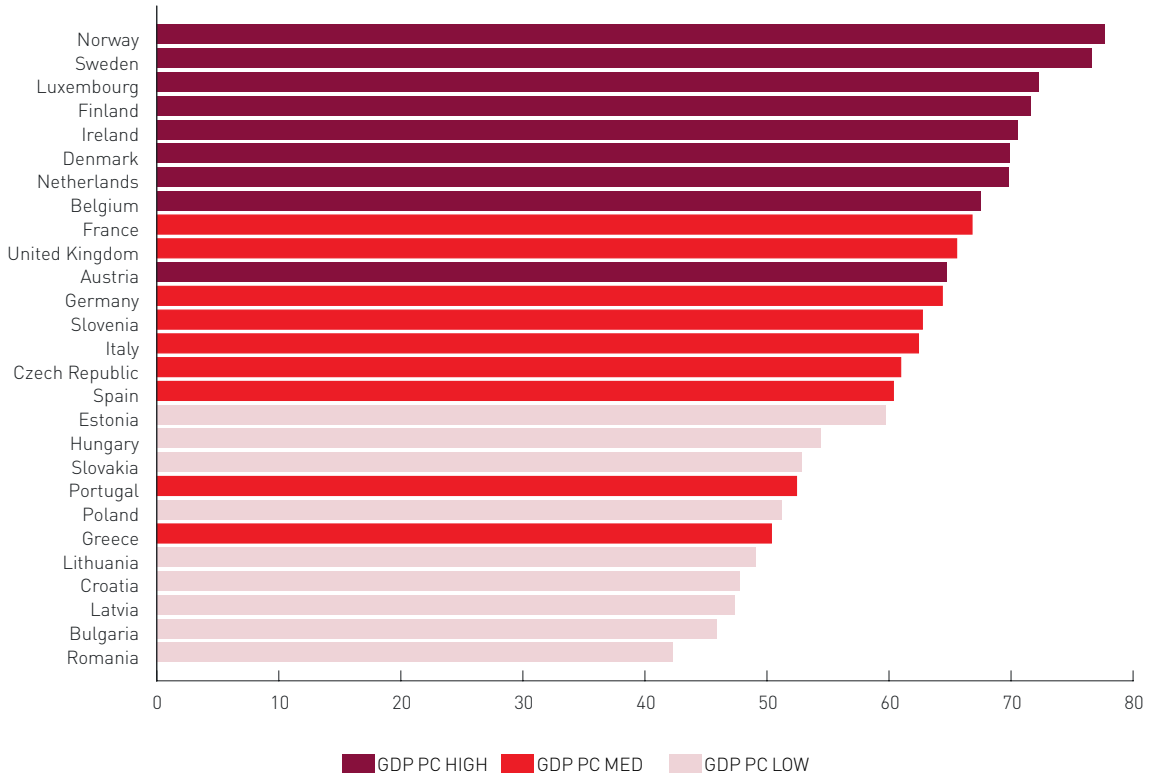
Source: Authors.

Figure 34. 'Individual' dimension of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 35. 'Individual' dimension of the Senior Economy Tracker by level of GDP per capita. 2020 Scores



Source: Authors.

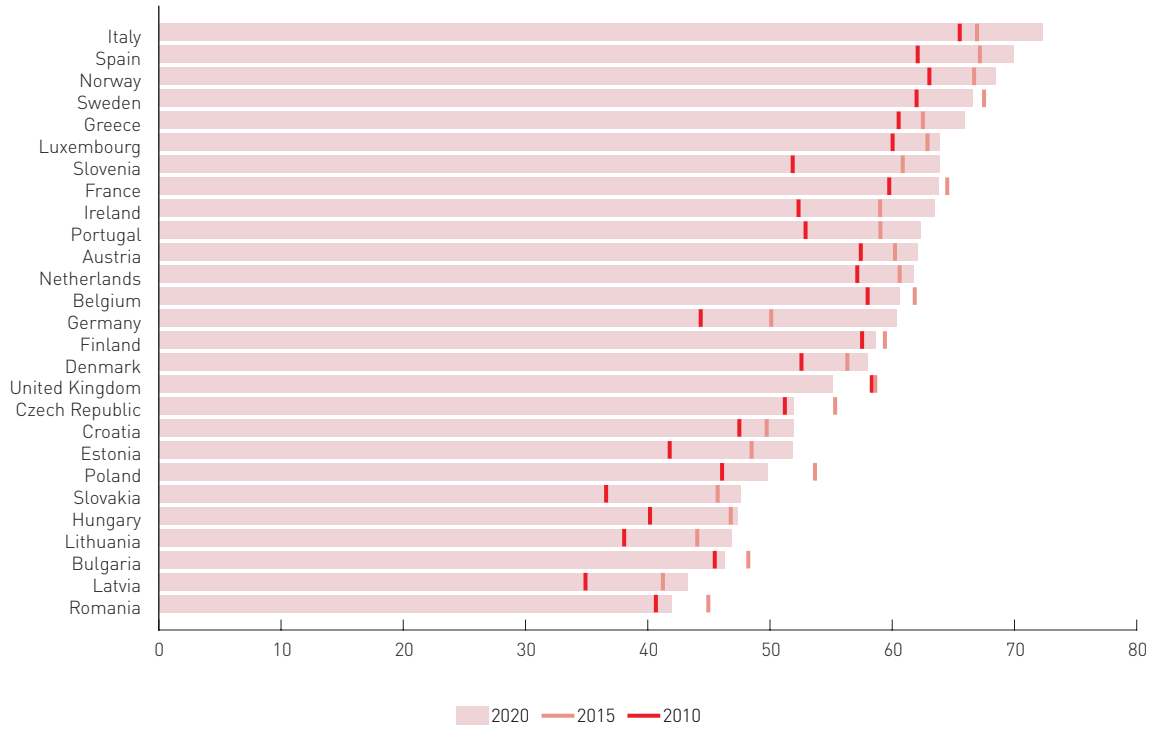
5. The Senior Economy Tracker: Analysis by Category

This section analyzes the results by category of the Senior Economy Tracker. Each *category* is balanced in its respective *dimension*. Statistical methods based on factor analysis were used to weight the individual variables (see Appendix I). The value of the weights assigned to each of the individual variables is shown in Annex II.

5.1. Category A1: Demographic Transition

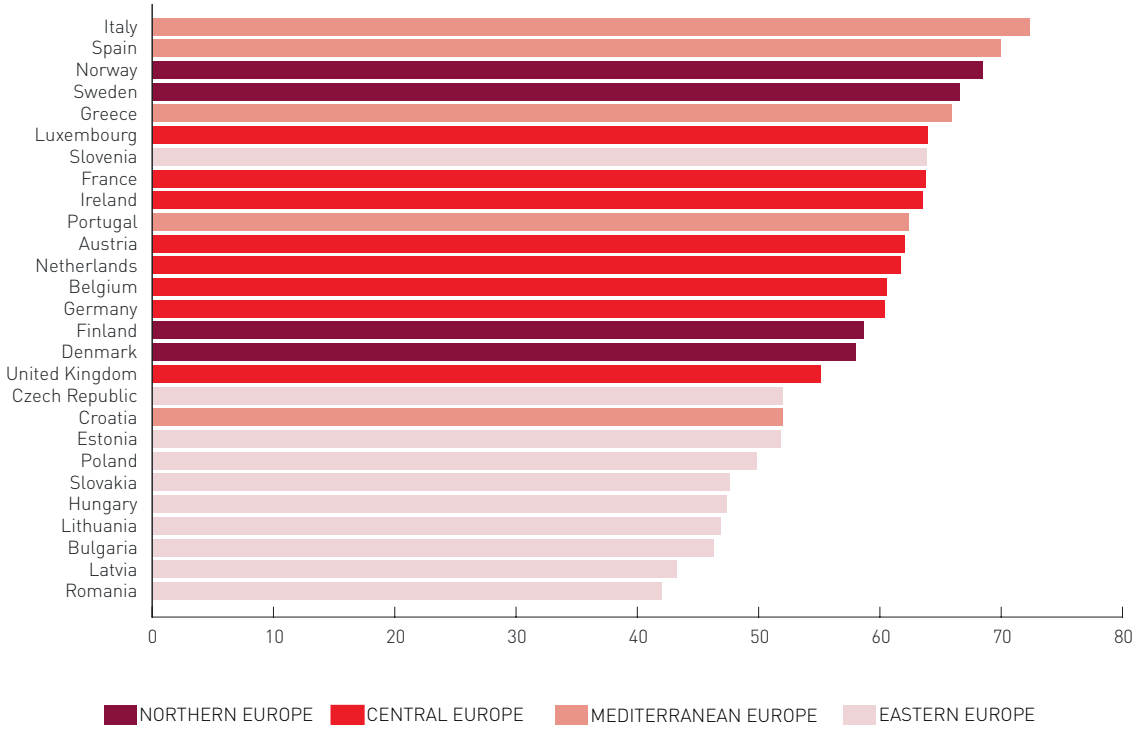
The 'Demographic Transition' category is the only one that makes up the social dimension in the Senior Economy Tracker. Therefore, in this case, the results by category coincide with the results by dimension. Thus, Figure 36, Figure 37 and Figure 38 highlight the evolution of the demographic aspects grouped under the demographic transition. Italy and Spain are leading the regions where demographic growth is progressing the most in Europe. In contrast, several countries regressed between 2015 and 2020: Belgium, Bulgaria, Finland, Poland, the United Kingdom, the Czech Republic, and Romania.

Figure 36. Evolution of the category 'Demographic Transition' del Senior Economy Tracker



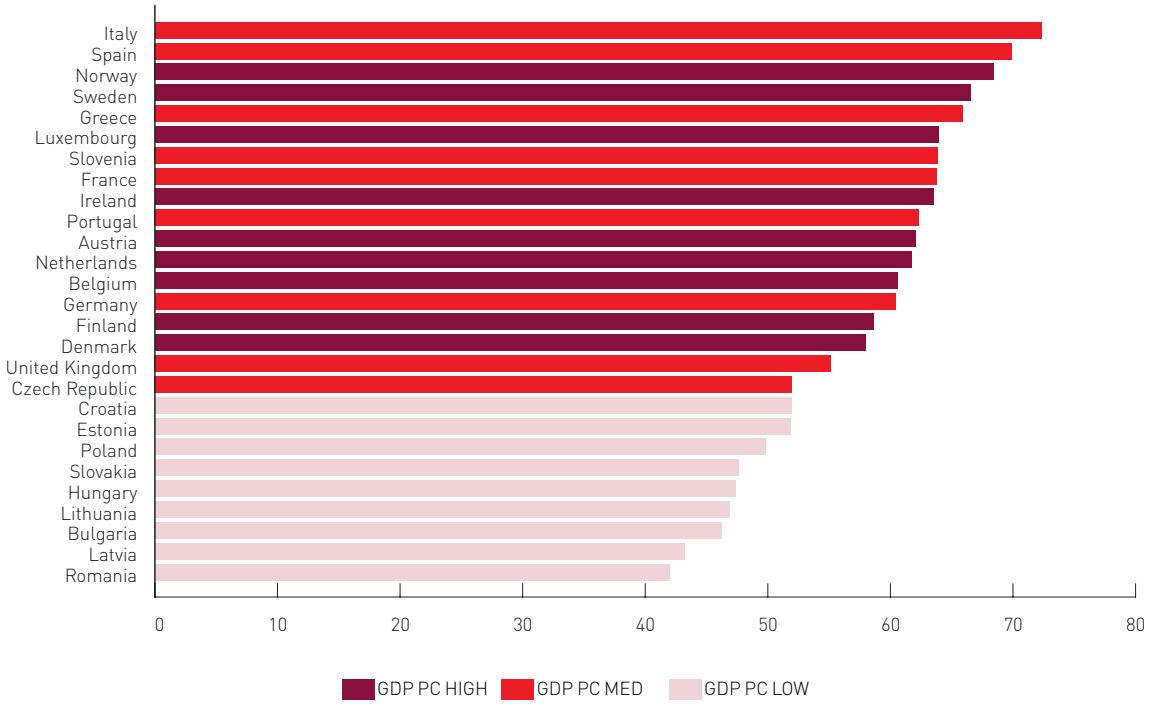
Source: Authors.

Figure 37. Category 'Demographic Transition' of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

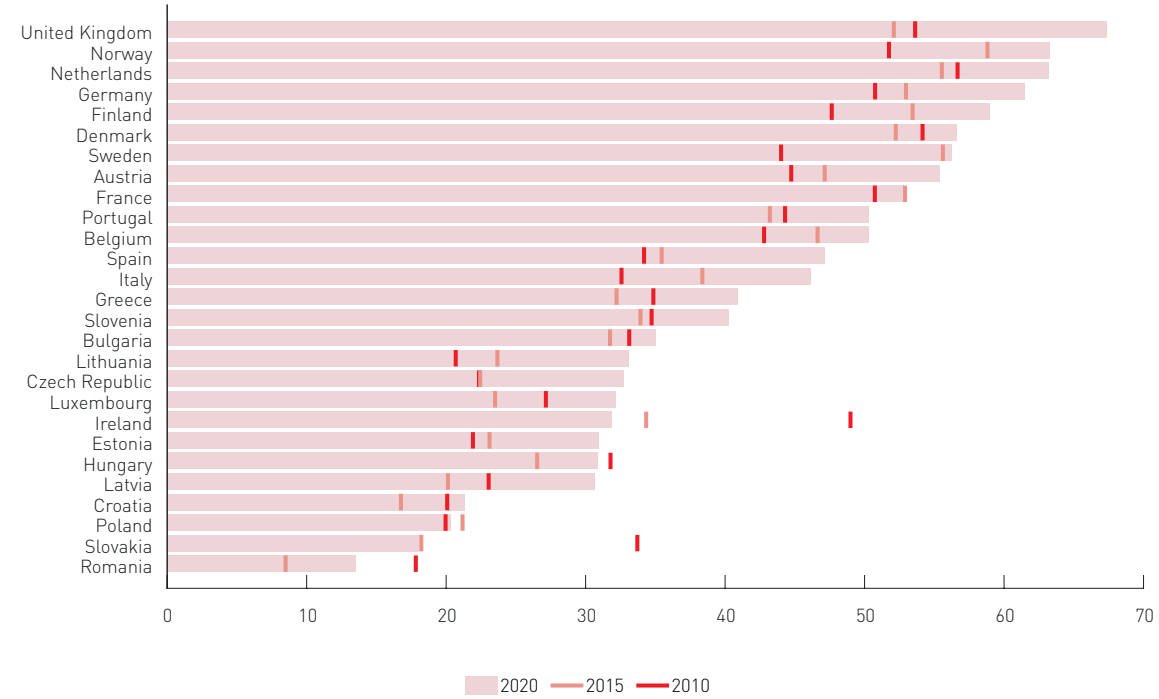
Figure 38. Category 'Demographic Transition' of the Senior Economy Tracker by level of GDP per capita. 2020 Scores



Source: Authors.

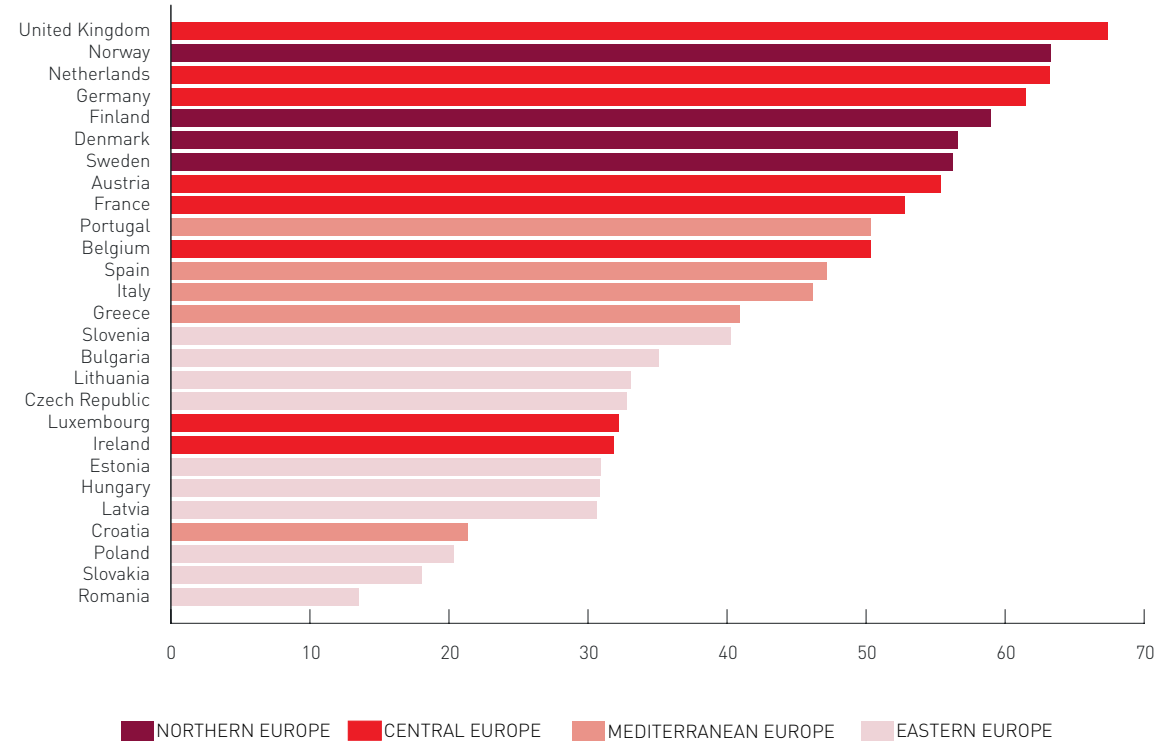
5.2. Category B1: Health and Social Protection

Figure 39. Evolution of the 'Health and Social Protection' category of the Senior Economy Tracker



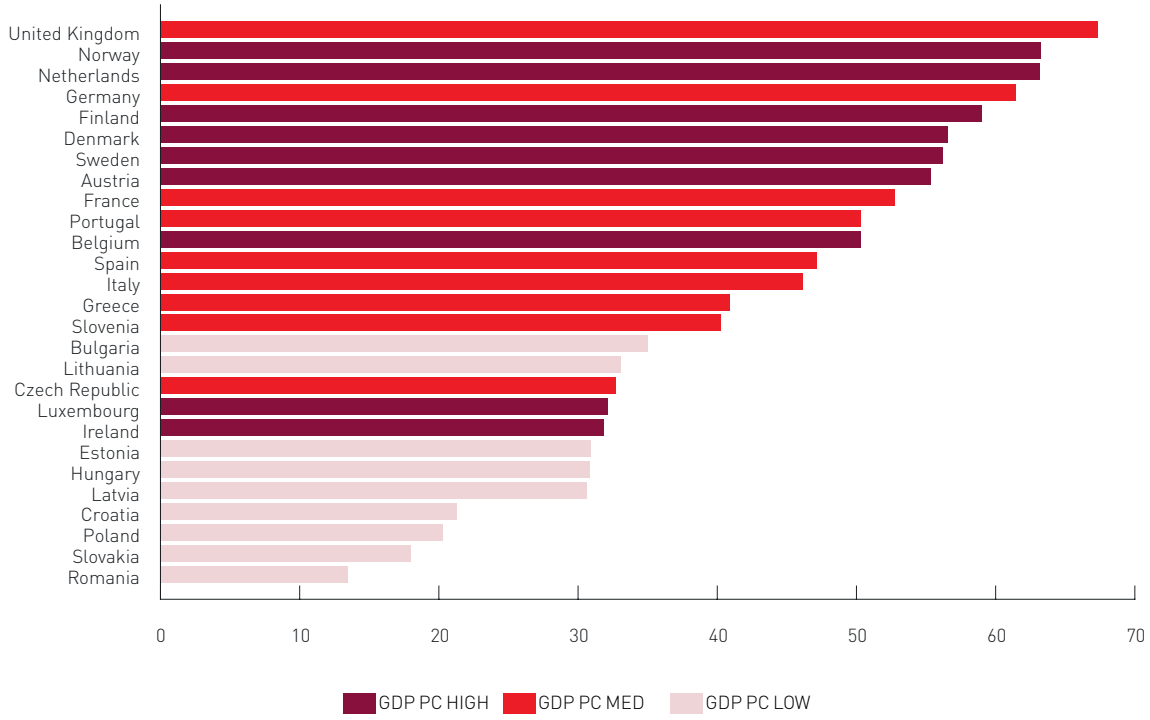
Source: Authors.

Figure 40. 'Health and Social Protection' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 41. Category 'Health and Social Protection' from the Senior Economy Tracker by GDP per capita. 2020 Scores



Source: Authors.

In the category of 'Health and social protection', within the institutional dimension, the United Kingdom, Norway and the Netherlands stand out (Figure 39). Ireland, which is down from its 2015 and 2010 scores, as well as Romania and Slovakia, are noteworthy. Overall, Central European countries present a higher proportion of leading positions than Northern European countries. Down in this category are the countries of Eastern Europe, which also show less advanced conditions in terms of GDP per capita. In addition, there is a considerable institutional gap in health and social protection between countries with high and medium GDP per capita versus those with less advanced economic conditions.

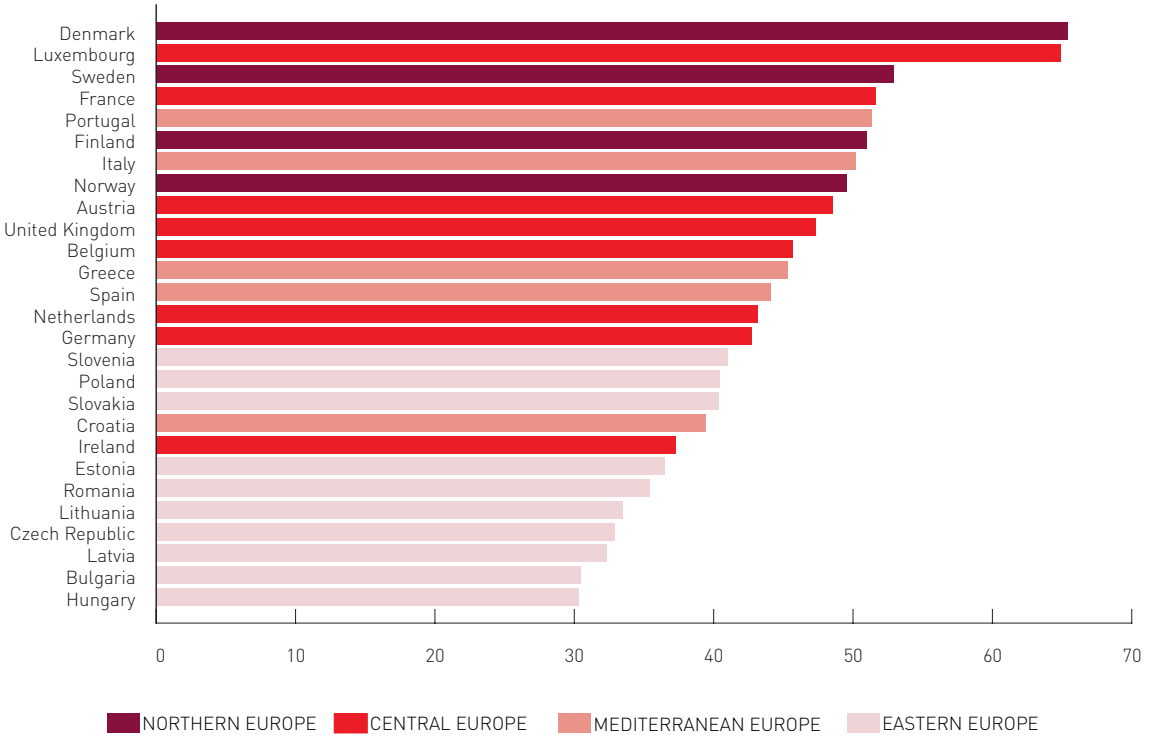
5.3. Category B2: Pensions and Labour Protection

The evolution of institutional progress in Europe in the field of pensions and labour protection is represented in Figure 42, as well as their categorization by geographical area (Figure 43) and by levels of GDP per capita (Figure 44).

Figure 42. Evolution of the 'Pensions and Labour Protection' category of the Senior Economy Tracker

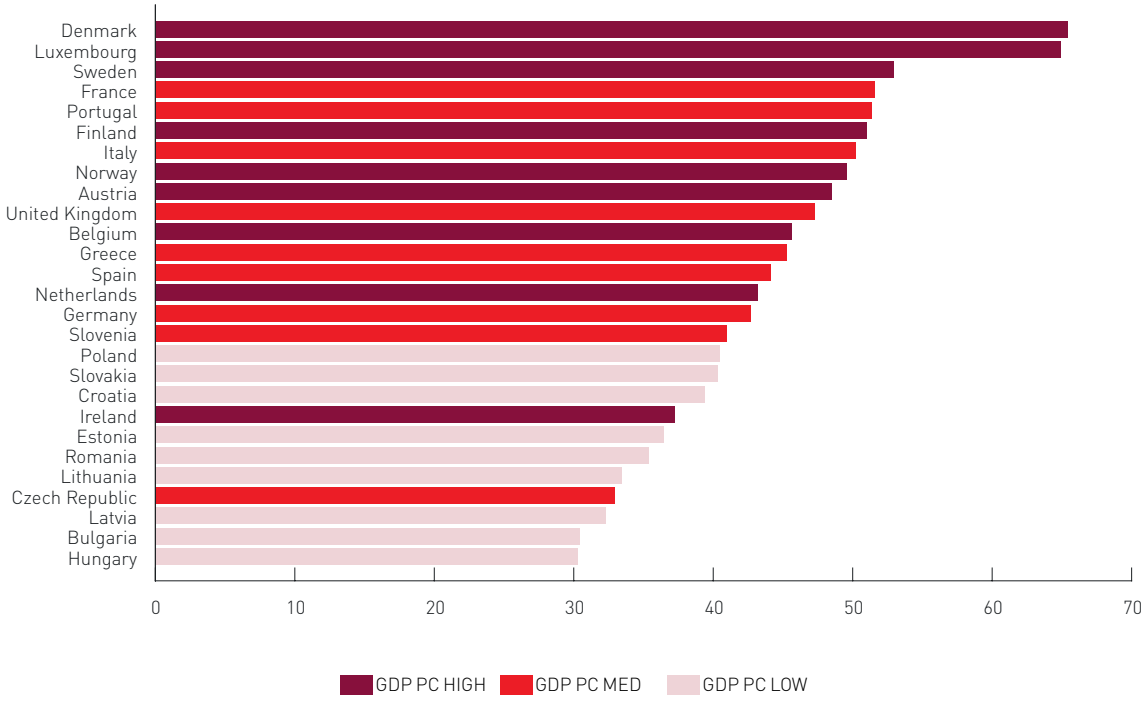
Source: Authors.

Figure 43. 'Pensions and labour protection' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 44. 'Pensions and Labour Protection' category of the Senior Economy Tracker per GDP per capita. 2020 Scores



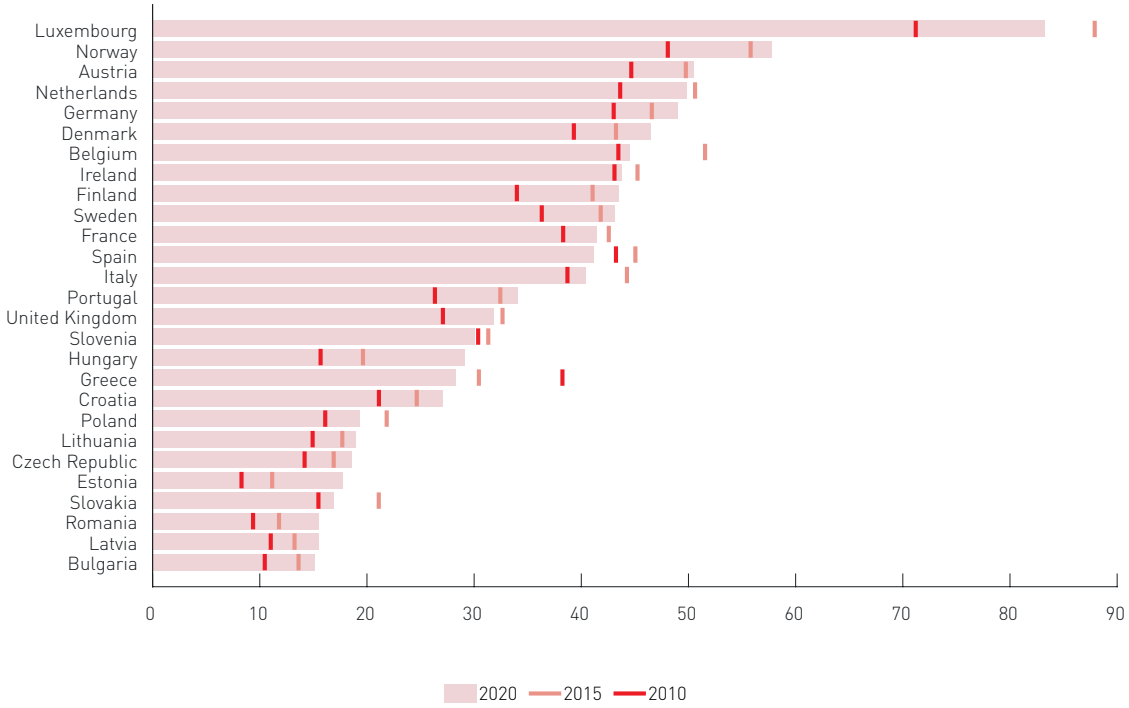
Source: Authors.

In pensions and labour protection, Denmark and Luxembourg stand out positively, well beyond the remainder European countries. The evolution is more heterogeneous in terms of levels of development, with certain countries with high GDP per capita (Ireland) or medium GDP per capita (Czech Republic) in low positions. Of note is the significant decline in this category between 2015-2020 and between 2010-2020 in Eastern European countries.

5.4. Category C1: Silver Goods and Services Market

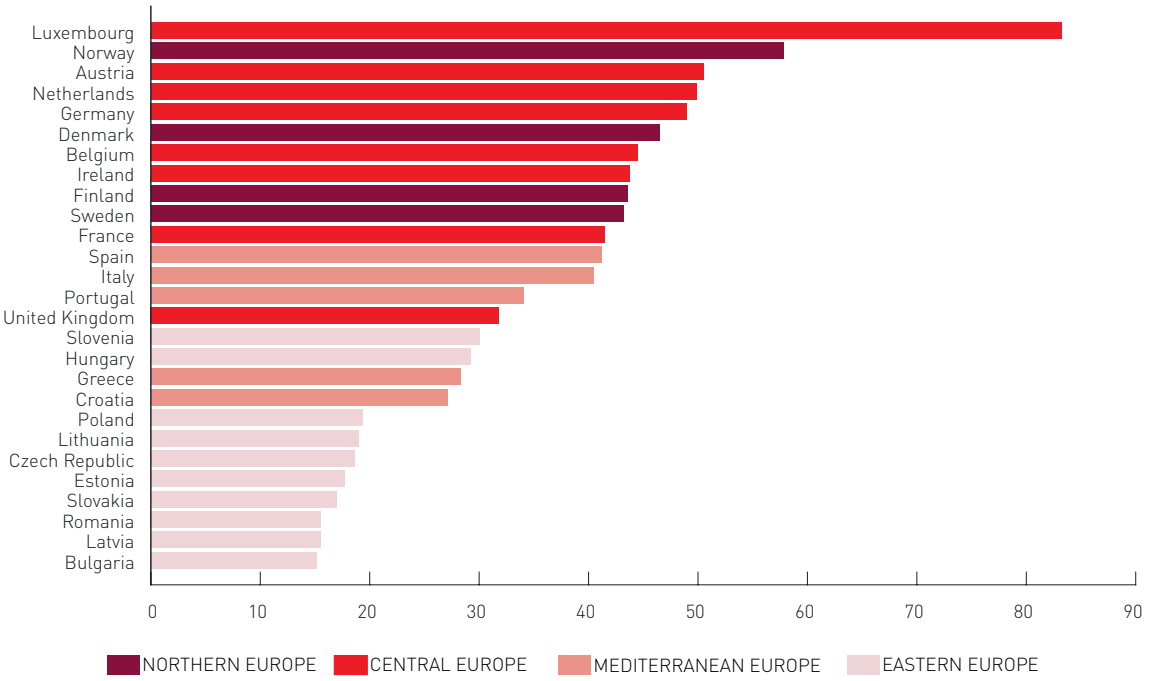
The market for goods and services for older cohorts is a key element in the macroeconomic dimension of the Senior Economy Tracker. Figure 45, Figure 46 and Figure 47 show their evolution over time, as well as by region and levels of economic development.

Figure 45. Evolution of the 'Silver Goods and Services Market' category of the Senior Economy Tracker



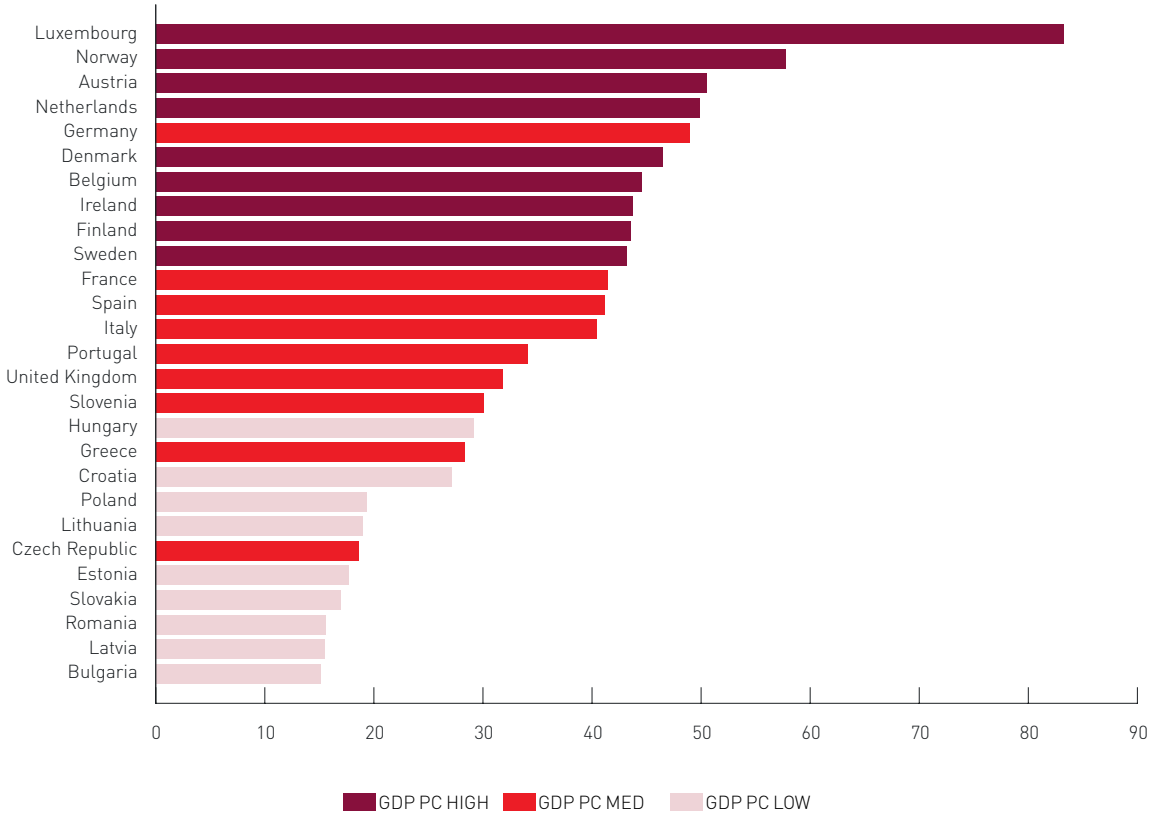
Source: Authors.

Figure 46. Senior Economy Tracker 'Silver Goods and Services Market' category by region. 2020 Scores



Source: Authors.

Figure 47. Silver Goods and Services Market Category of the Senior Economy Tracker by GDP per capita. 2020 Scores



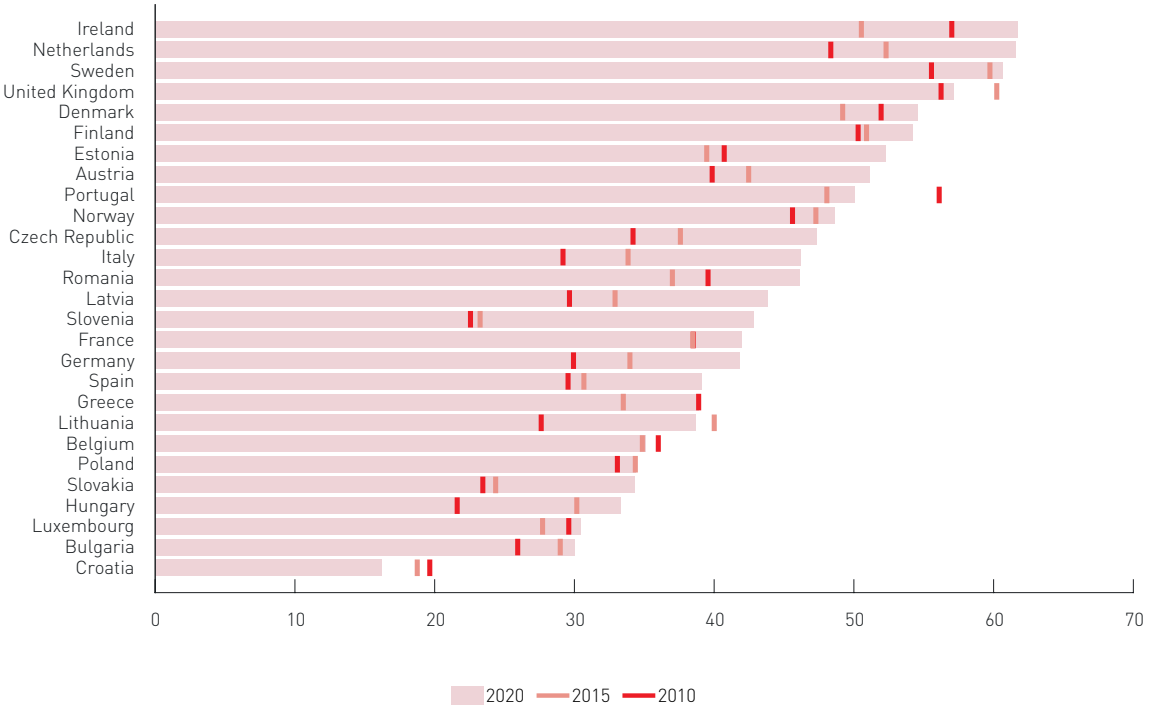
Source: Authors.

Regarding the market for goods and services consumed by the senior population, the Central European countries (Austria, the Netherlands and Germany) stand out, as well as Luxembourg and Norway. Finally, it is significant that in quite a few of the countries analyzed (12 out of the 27), this market has contracted, probably due to the pandemic in 2020.

5.5. Category C2: Silver Labour Market

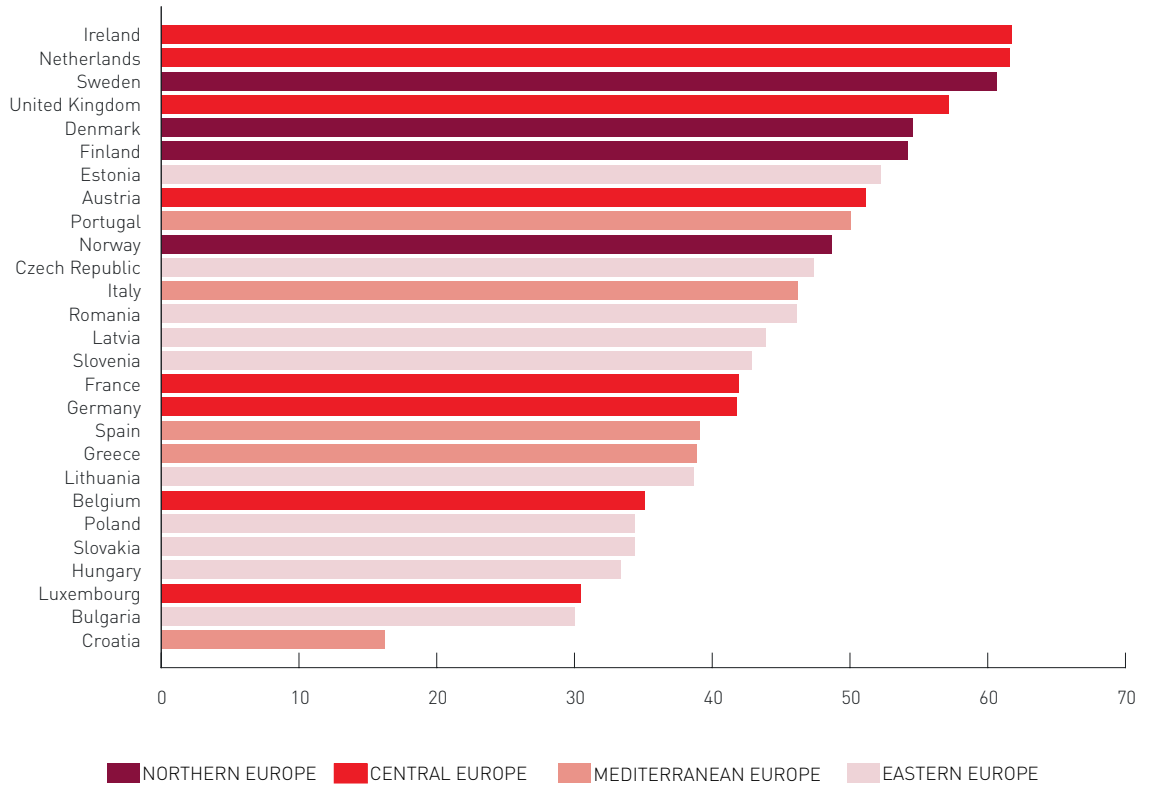
Within the macroeconomic dimension of the Senior Economy Tracker, the silver job market represents senior job opportunities, both employed and self-employed. Figure 48 shows the evolution over time, while Figure 49 and Figure 50 classify the developments related to the Silver market by geographical areas and levels of economic activity.

Figure 48. Evolution of the 'Silver Labour Market' category of the Senior Economy Tracker



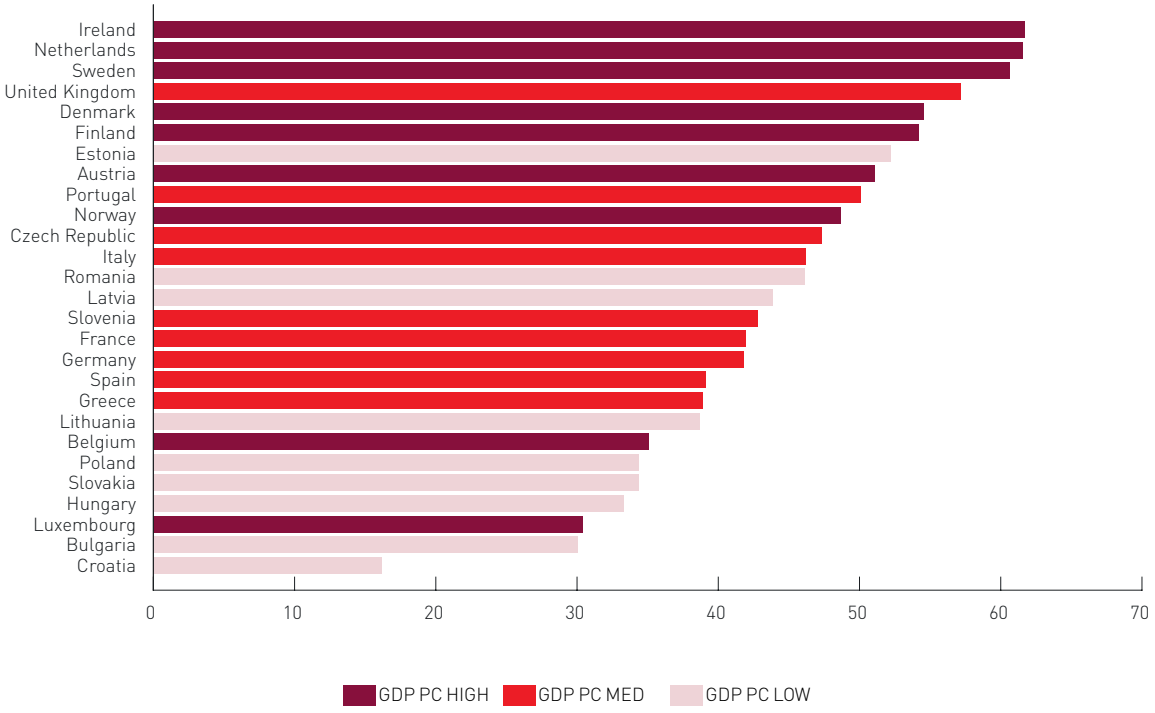
Source: Authors.

Figure 49. 'Silver Labour Market' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 50. 'Silver Labour Market' category of the Senior Economy Tracker by GDP per capita. 2020 Scores



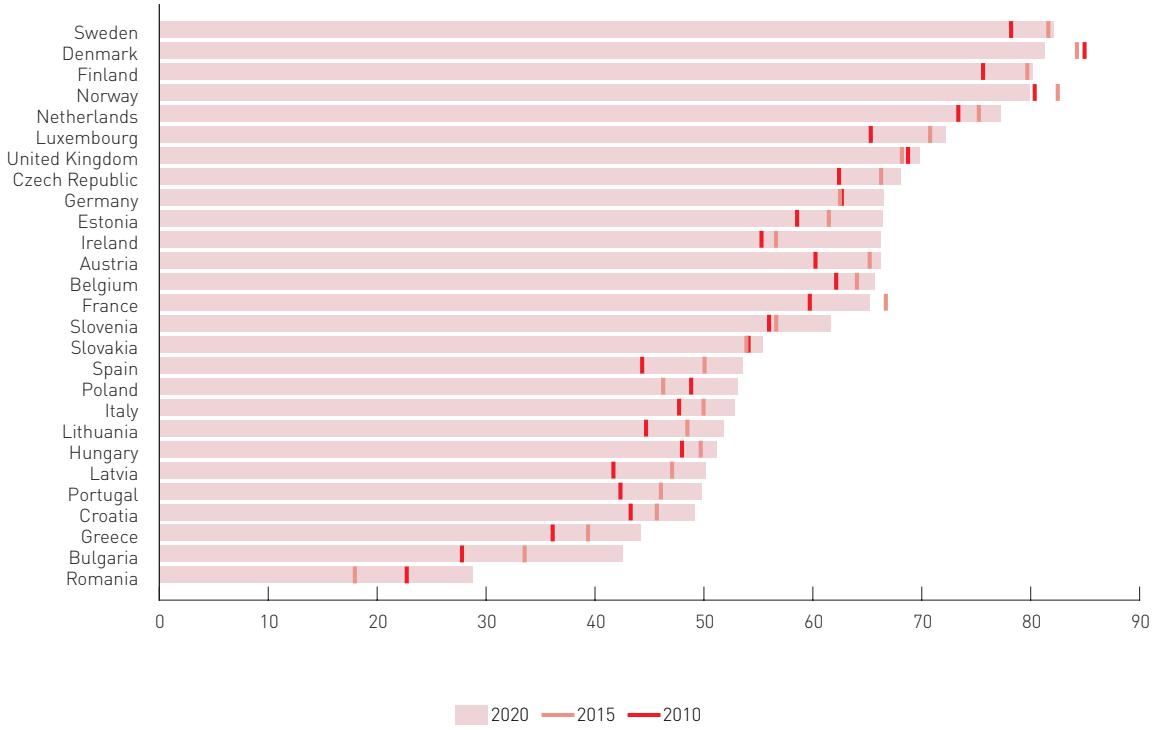
Source: Authors.

In terms of the role of the senior labour market in the development of the silver economy, Ireland, the Netherlands and Sweden are the pioneers, followed by the United Kingdom, which, despite its fourth place in this category, shows significant deterioration compared to its scores in 2015. The deterioration of the 'silver labour market' in Portugal is significant, presenting setbacks between 2015 and 2020. In contrast to other categories, there is a heterogeneity in the results whereby there is a variety of countries in the lead, with different economic development profiles and coming from different geographical areas.

5.6. Category D1: Participation in society

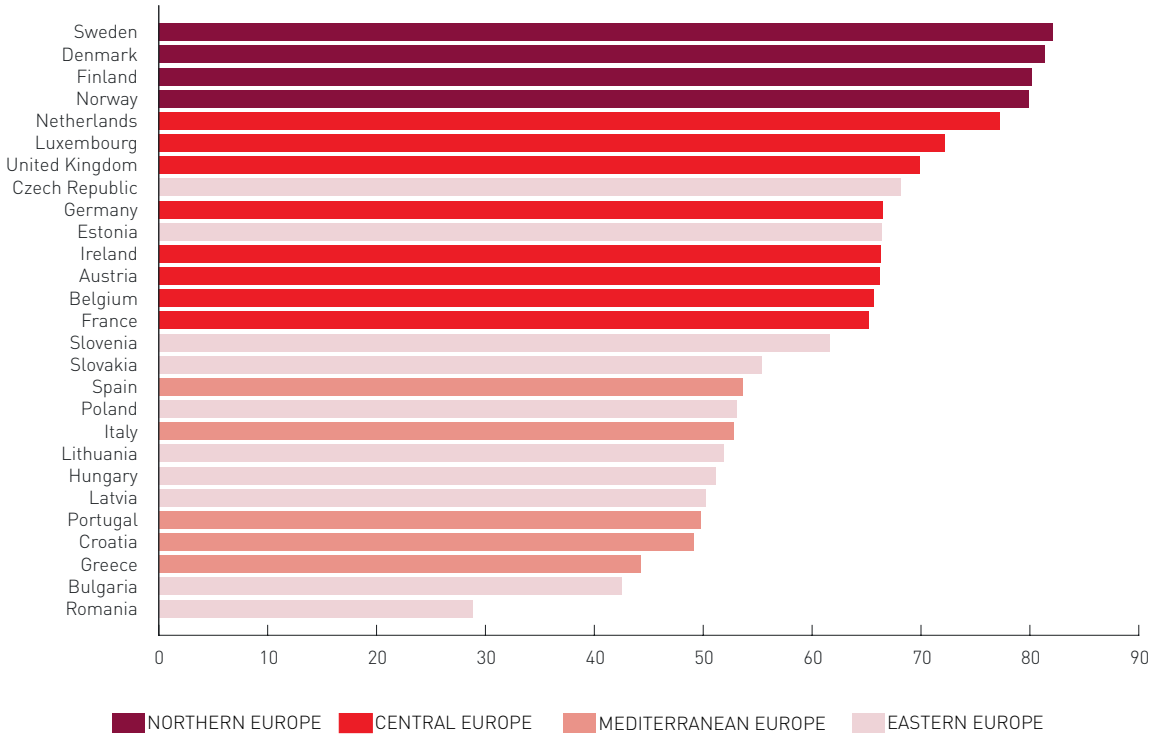
Social participation is part of the individual challenges of the longevity economy. Figure 51 shows its evolution in the period analyzed. At the same time, Figure 52 and Figure 53 present the 2020 data classified by regions and by GDP per capita.

Figure 51. Evolution of the 'Participation in Society' category of the Senior Economy Tracker



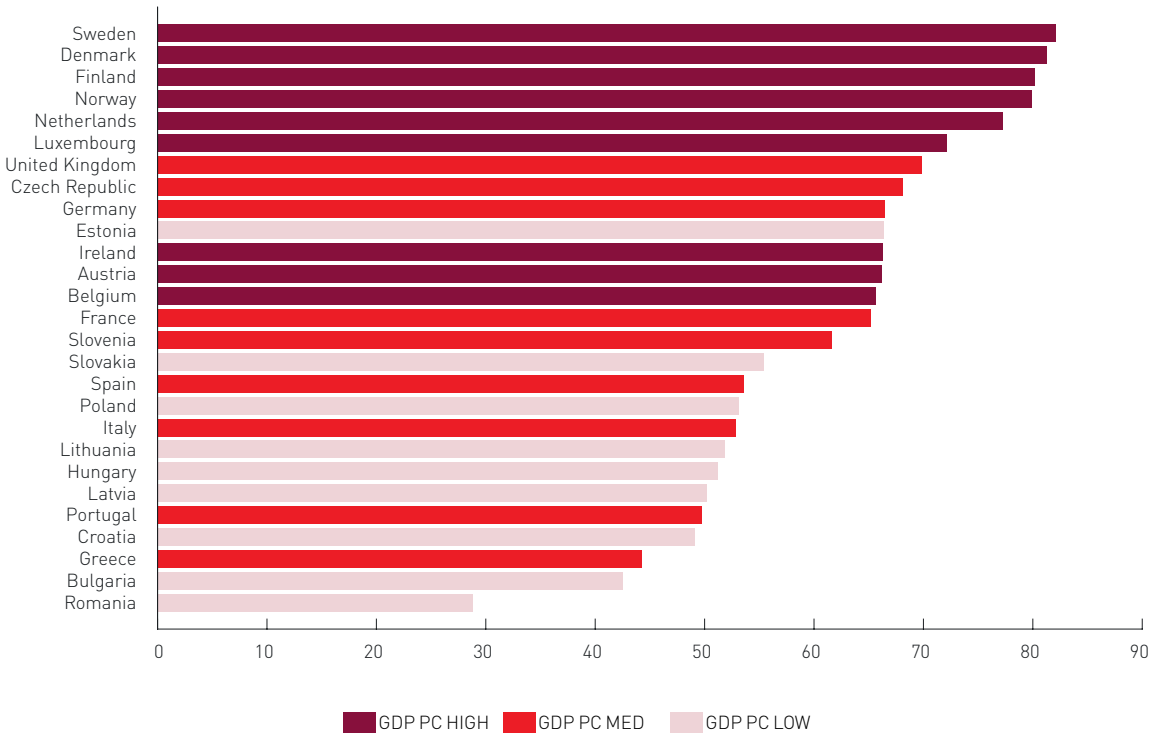
Source: Authors.

Figure 52. 'Participation in Society' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 53. 'Participation in Society' category of the Senior Economy Tracker by GDP per capita. 2020 Scores



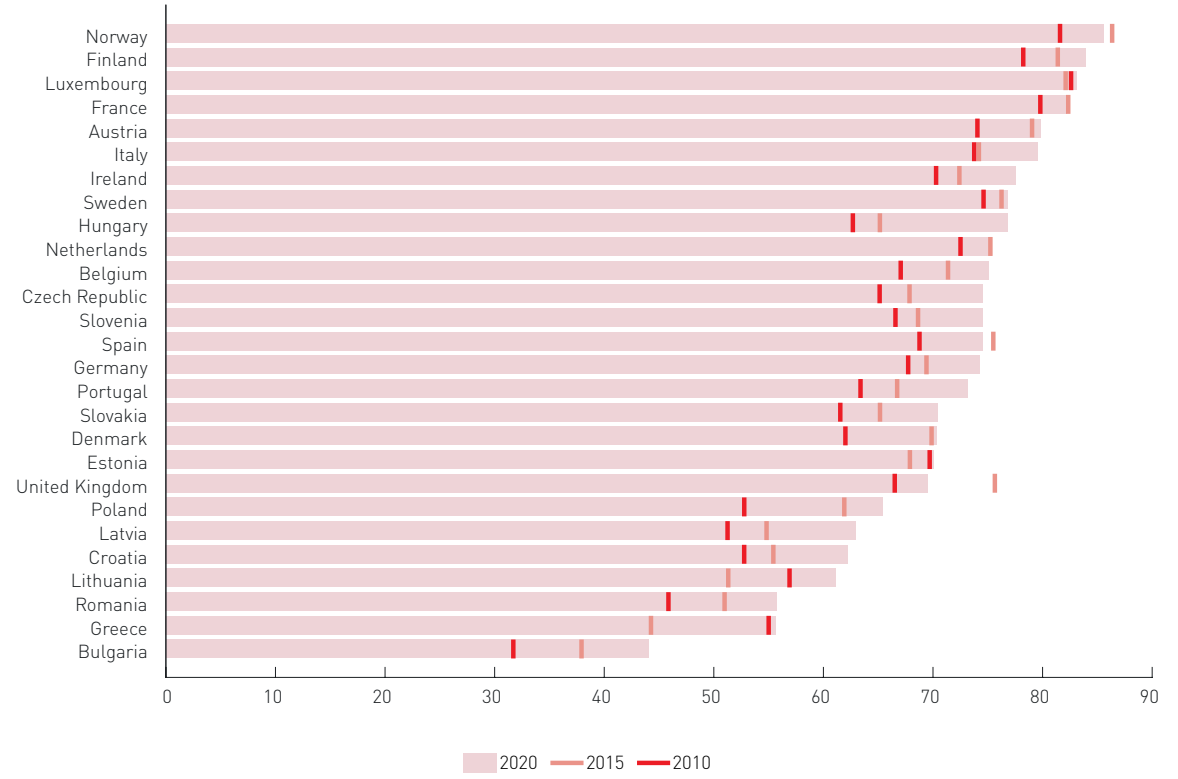
Source: Authors.

In relation to senior participation in society, the Nordic countries (Sweden, Norway, Denmark and Finland) are clearly ahead of the countries of Mediterranean and Eastern Europe, with Greece, Bulgaria and Romania at the bottom of the rankings. These results show the need to raise awareness and involve society in the participation and inclusion of seniors as a tool to achieve a long and good quality of life.

5.7. Category D2: Financial Security

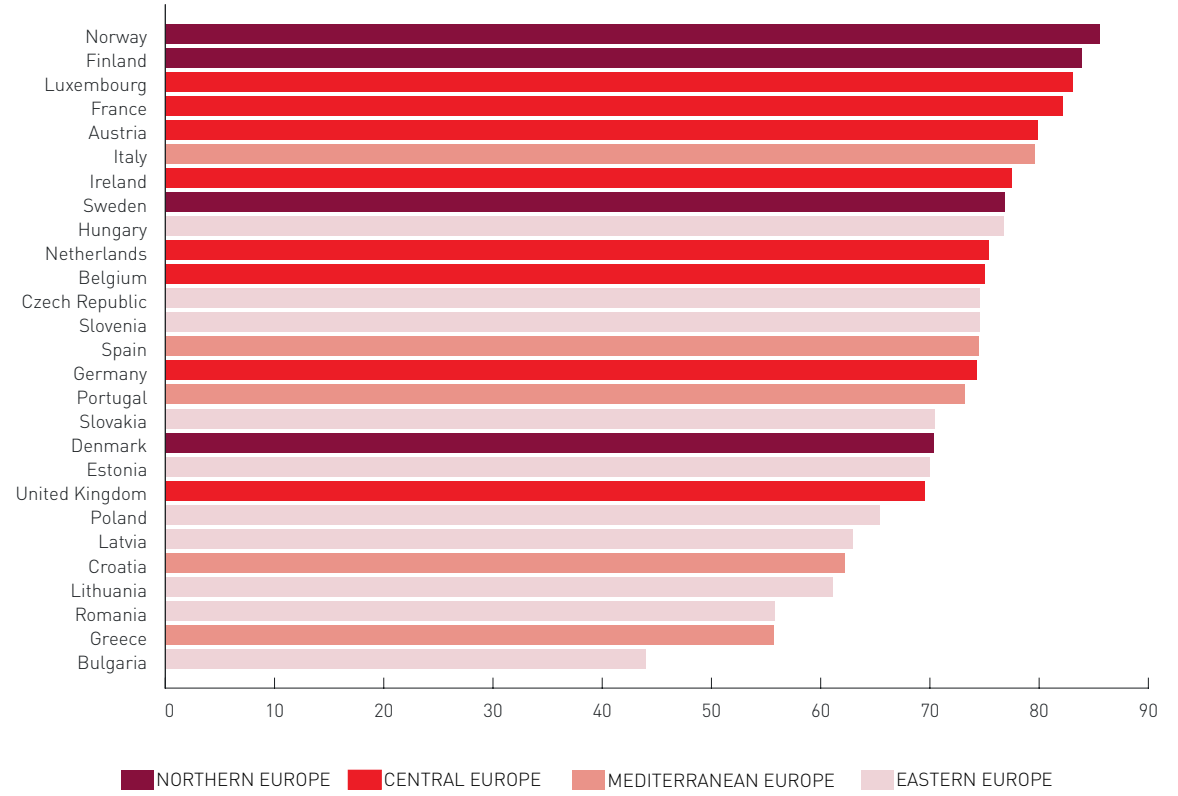
Financial security is a basic pillar in advancing the longevity economy. Figure 54, Figure 55 and Figure 56 show its evolution and features by geographical areas and economic development.

Figure 54. Evolution of the 'Financial Security' category of the Senior Economy Tracker



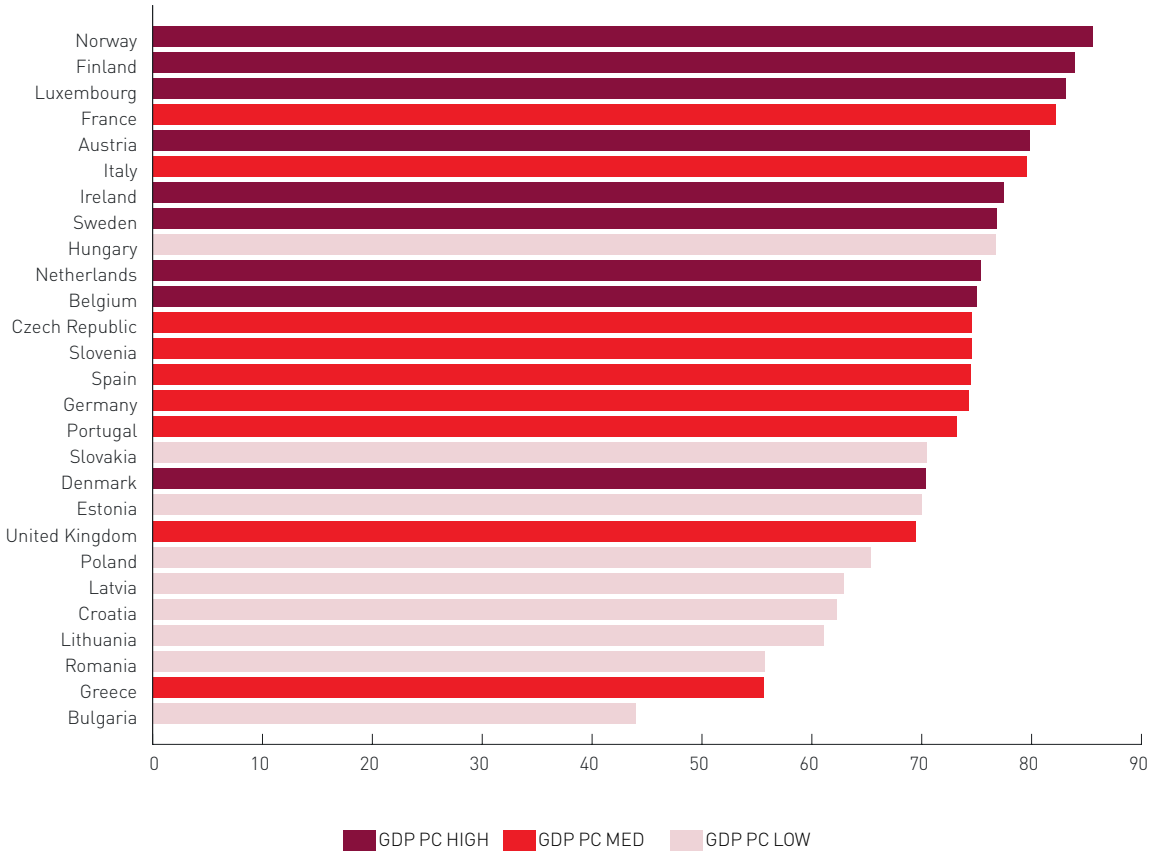
Source: Authors.

Figure 55. 'Financial Security' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 56. 'Financial Security' category of the Senior Economy Tracker by GDP per capita. 2020 Scores



Source: Authors.

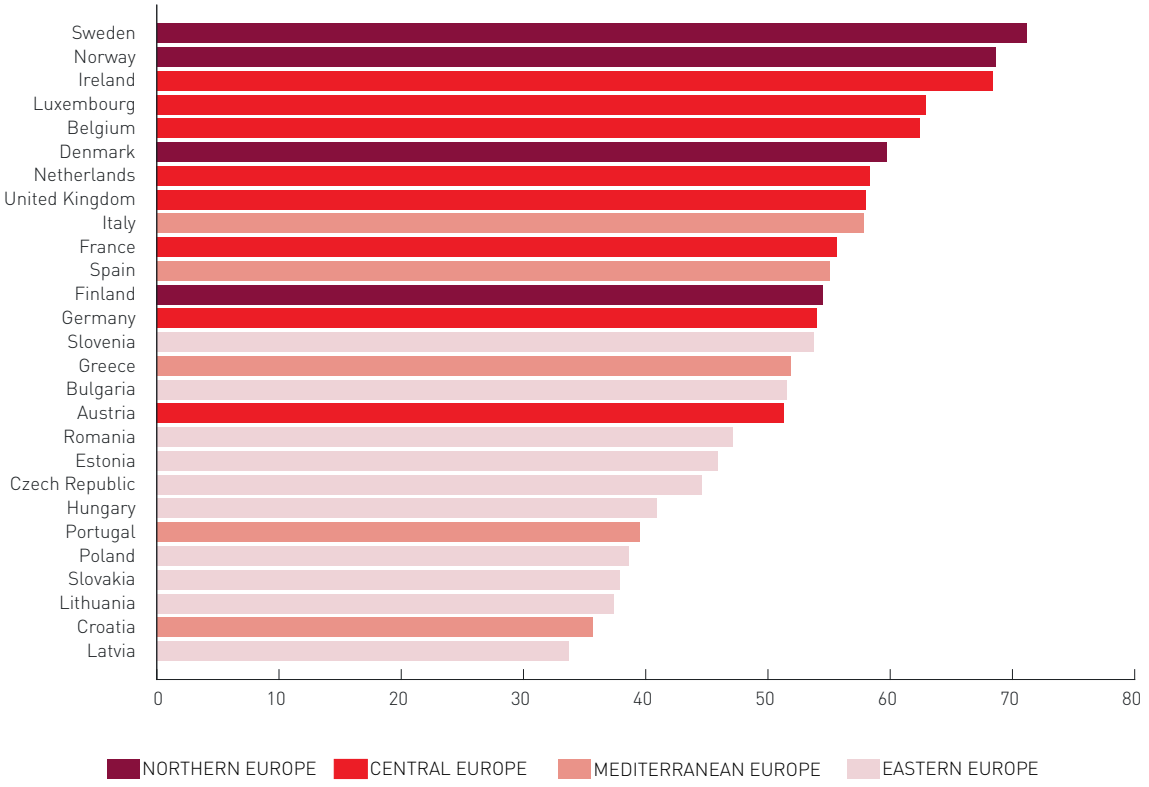
The countries that lead the financial security category are Norway, Finland and Luxembourg. The evolution over time in Figure 54 shows that both the UK and Spain have regressed in their financial security positions compared to 2015.

5.8. Category D3: Healthy and Active ageing

Figure 57. Evolution of the 'Healthy and Active ageing' category of the Senior Economy Tracker

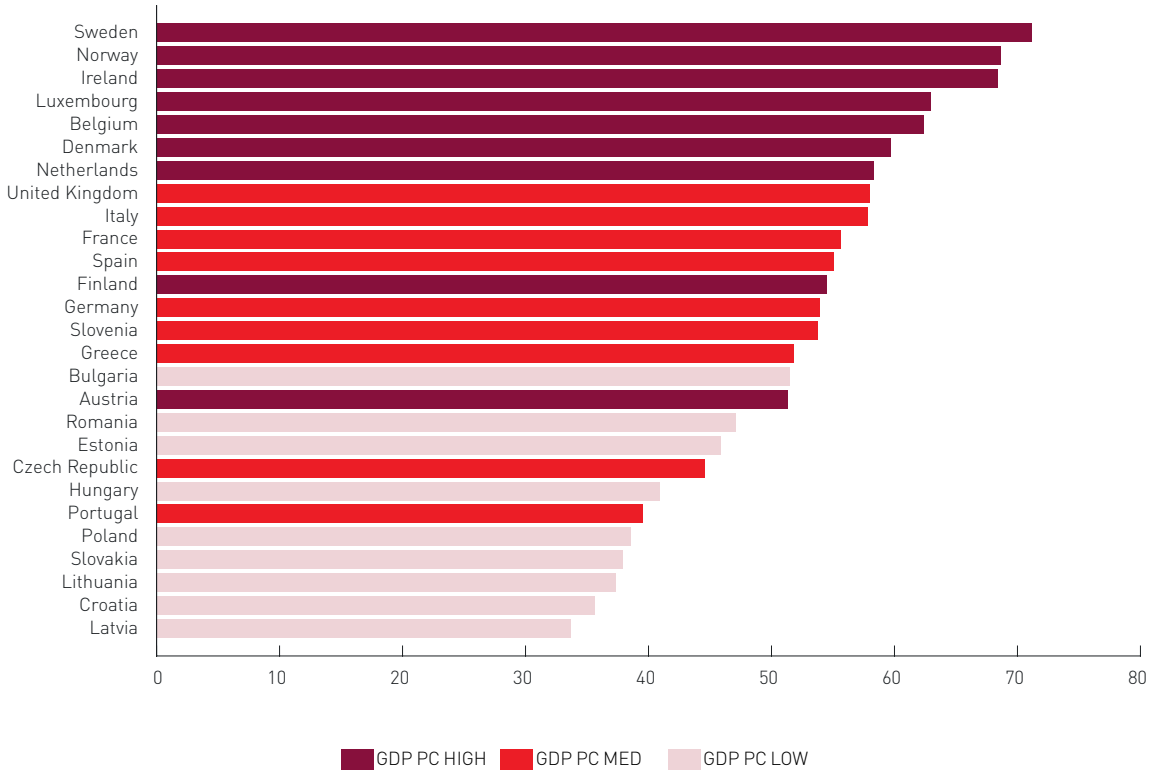
Source: Authors.

Figure 58. 'Healthy and Active ageing' category of the Senior Economy Tracker by region. 2020 Scores



Source: Authors.

Figure 59. 'Healthy and Active ageing' category of the Senior Economy Tracker GDP per capita. 2020 Scores



Source: Authors.

In the category 'Healthy and active ageing' (Figure 57) the leaders belong to countries with high GDPs such as Sweden, Norway and Ireland, while the countries of Eastern Europe have the last positions. In addition, the decline in this category between 2015 and 2020 in almost half of the countries in the sample is significant. In these cases, social awareness work is crucial to ensure a long quality life.

6. Sensitivity analysis

To verify the robustness of our methodology, a sensitivity analysis was carried out. This analysis allows to identify indicator changes in the face of different scenarios or methodological decisions, comparing them with the results obtained in the base scenario, which corresponds to the Senior Economy Tracker presented in this report.

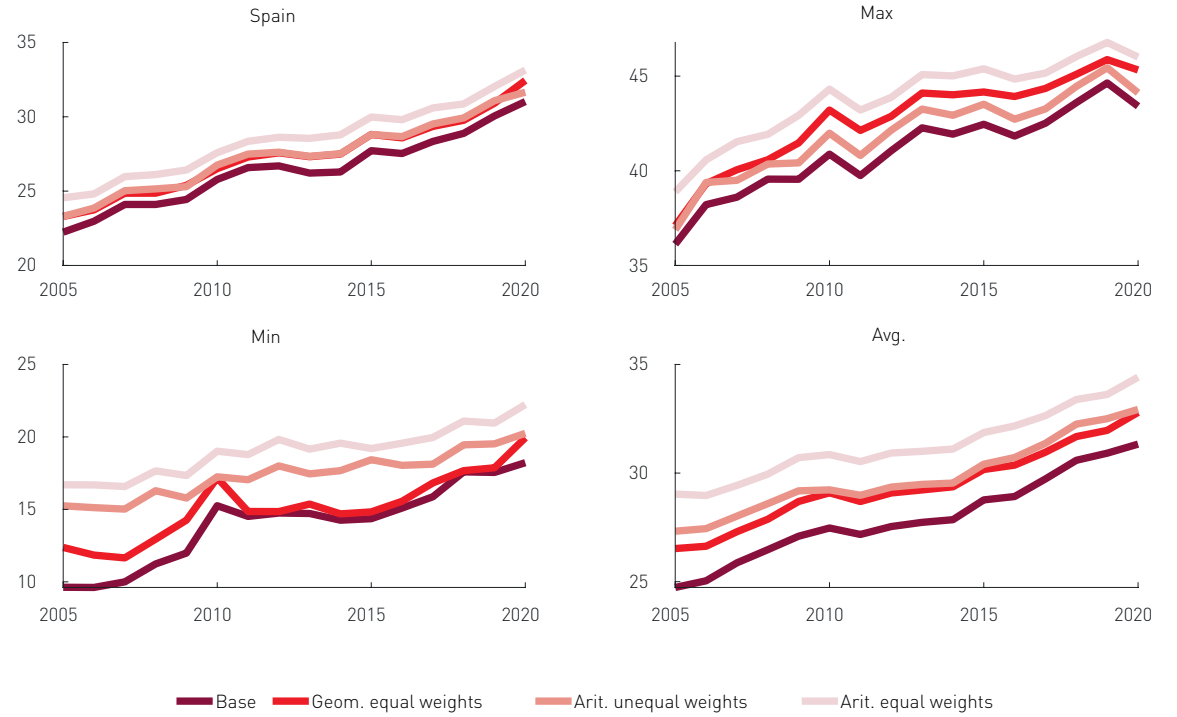
The characteristics of all the scenarios considered are detailed in the methodological guide (Annex I), which also presents and explains the different methodological decisions made in each stage of the Tracker construction. Table A1.2 (Annex I) summarizes the differences between the baseline scenario and the alternative scenarios.

Figure 60 shows the result obtained in each of the scenarios against: I) results of Spain (2005-2020); II) maximum values recorded throughout the sample (2005-2020); III) minimum values recorded throughout the sample (2005-2020); and, IV) mean values recorded throughout the sample (2005-2020). The sensitivity study focuses on the comparison of the temporal evolutions depending on the applied scenario and not so much on their absolute values. We observe that the dynamics of the indicator are very similar for all scenarios (all series advance almost in parallel). This means that the possible methodological changes associated with each scenario would not have a large impact in Spain and other countries close to the average. In addition, when the Tracker presents values close to the mean, it can be deduced that the dimensions are balanced since geometric aggregation scenarios present similar dynamics to those where arithmetic aggregation is applied.

The results obtained for the minimum values show the non-compensatory effects of geometric aggregation. Figure 60 (Minimum) shows two clearly identifiable periods before and after 2010. Until 2010, the base scenario presented a lower value than the geometric and equal weighting scenario. This means that during this period the macroeconomic dimension was below the others, since in the base scenario, this dimension weights more than the others. Thus it "pulls" the entire indicator downwards, especially taking into account that with geometric aggregation, the imbalances between dimensions are penalized. Since 2010, the difference between the baseline and the geometric and equal weighting scenario has narrowed, possibly because the difference between the macroeconomic dimension and the rest of the dimensions has also narrowed. In the case of the scenarios with arithmetic aggregation, these differences between dimensions are compensated, which reduces the temporal variations.

From the perspective of maximum values, Figure 60 (Maximum) shows how the temporal differences between the four scenarios remain almost constant. The fact that the values of the equal weighting scenarios are higher means that the macroeconomic dimension has slightly lower values than the other dimensions. On the other hand, since the difference between the geometric and arithmetic scenarios remains constant over time and is small, it means that the trade-off between dimensions is low and without great variations over the period studied.

Figure 60. Sensitivity analysis. Variations in the scores



Source: Authors.

With these results we can conclude that the changes in the temporal evolution of the indicator are small in the face of changes in scenarios, finding the greatest differences in the minimum values of the scenarios where geometric aggregation is applied. These differences arise because this type of aggregation penalizes imbalances between dimensions (the greater the weight associated with the unbalanced dimension(s), the greater the penalty).

The second part of the sensitivity study focuses on analyzing how the choice of both weights and the aggregation technique used affects the ranking of countries. Figure 61 shows the variations of each scenario with respect to the base (whose ranking is the one indicated on the left of the figure). Those countries with bars in a given scenario have changed their position relative to the baseline scenario (negative bars indicate a decline in the ranking and viceversa). Figure 61 shows that there are no major variations in the result when the weights or aggregation techniques are modified. Most of these variations appear in countries positioned in areas of maximum and minimum levels. In addition, the bulk of these variations corresponds to changes in the ranking in only one position (either up or down), while the largest variation recorded is the rise of three positions (corresponding to Luxembourg in the arithmetic and unequal weighting scenario). Countries with an intermediate position in the ranking are the ones with the least variations when comparing the baseline scenario with the rest of the scenarios.

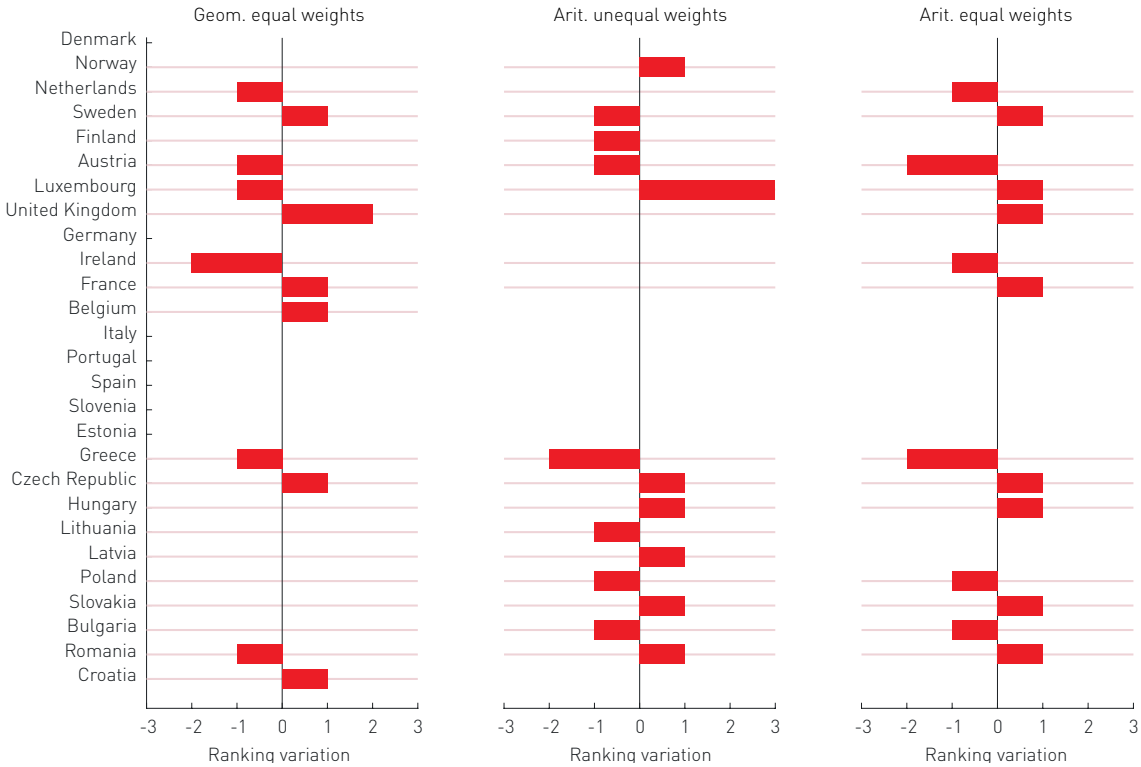
The countries with the most significant variation in their position depending on the scenario chosen are the following:

- In the geometric and equal weighting scenario, the United Kingdom improves its position by two places while Ireland worsens it.
- In the arithmetic and unequal weighting scenario, Luxembourg rises three places, while Greece drops two.
- In the arithmetic and equal weighting scenario, Austria and Greece are the most affected countries, both dropping two positions.

On the other hand, countries such as Denmark, Germany, Italy, Portugal, Spain, Slovenia and Estonia are never affected by changes in scenario.

Finally, Figure 62 presents the changes in the ranking produced in the different scenarios (again with

Figure 61. Sensitivity analysis. Changes in positions in the 2020 ranking by country

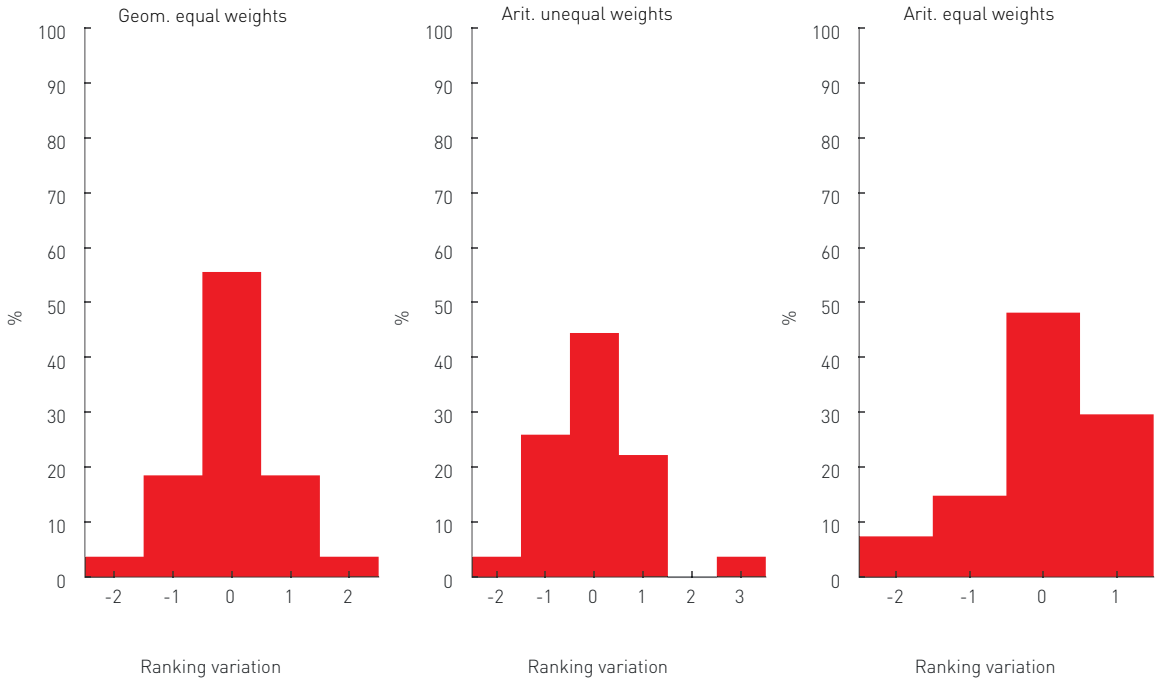


Note: Ranking of countries on the left based on baseline scenario results.
Source: Authors.

respect to the ranking obtained in the base scenario). In the case of the geometric and equal weighting scenario, about 55% of the countries maintain their position in the ranking, 40% have variations in one position, and only 5% have variations in two positions. With the arithmetic and unequal weighting scenario, almost 50% of the countries do not show variations, another 45% show unitary variations and only 5% show variations in two or three positions, with Luxembourg being the country that increases its position by three points in the ranking. Finally, with the arithmetic and equal weighting scenario, around 50% of countries maintain their position, about 45% show unit variations, and a percentage slightly above 5% decrease their position in the ranking by two points.

These results show that the Senior Economy Tracker is robust, even in the face of possible methodological changes that could be applied.

Figure 62. Sensitivity analysis. Changes in positions in the 2020 ranking in proportion to the sample as a whole



Source: Authors.

Conclusions

The demographic transition towards a long-lived population is one of the great social challenges we face globally. While developed countries are pioneers in this trend, estimates indicate convergence in developing countries as well. There are fears that this transition will weaken economic growth, as countries will have to cope with rising dependency ratios. However, the potential that seniors can create is underestimated. Some examples include: (i) non-commercial productive activities (e.g. care of dependents or counselling); (ii) productive activities (old-preneurship, lengthening of working life with flexible formulas that allow them to capitalise on their know-how) ; and, iii) phenomena associated with technological and institutional innovations that not only mitigate the adverse effects of the demographic transition, but capitalize on them through the so-called 'longevity dividend'.

The challenges presented by the longevity economy require adequate public, organizational and personal management. To this end, we propose the first holistic and quantitative indicator that represents the evolution of the longevity economy: the Senior Economy Tracker. It is a fundamental tool for assessing the degree of evolution and development of the longevity economy in each country. At the same time, it serves to compare the progress of the longevity economy between countries, and intra-country, observing its historical evolution at the national level. In addition, its architecture by dimensions, categories and base indicators allows granularity to be provided to the analysis, identifying the aspects that require greater attention, or those that have evolved more satisfactorily. In other words, the different returns obtained by the Senior Economy Tracker can be analyzed by looking at their dimensions, categories and individual variables. The principles informing the development of the Senior Economy Tracker include multidimensionality, comprehensiveness, multi-stakeholder, easy to interpret, use of public data sources, and comparable in time and geography *(intra-country and inter-country*). The indicator is adjusted for the demographic pressure of each country, which implies that the greater the demographic transition, the greater the progress required per country. In other words, the response to the socio-economic challenges of the demographic transition must be adapted to the pace of change in its population structure. Therefore, those countries that make the necessary reforms due to the demographic changes they are experiencing will obtain a higher score in the Tracker and vice versa. Thus, the Tracker allows to determine the degree of alignment between the demographic transition and social, institutional, macroeconomic and individual changes.

This study shows the quantitative results of the Senior Economy Tracker indicator for 27 European countries in the period 2005-2020. Denmark is the primacy in the position with 43.41 points in 2020, compared to Spain (31.02 points) and Croatia (18.22 points) which is classified last in 2020. In the comparison by dimensions, Spain stands out in the social dimension that includes demographic variables, while it is in the average in the other dimensions. Denmark, the Netherlands and Norway lead respectively in the institutional, macroeconomic and individual dimensions in 2020. In the analysis by category, Denmark and Luxembourg are leaders in 'Pensions and occupational protection' and the United Kingdom in 'Health and social protection'. In the macroeconomic dimension, the best countries are Ireland and the Netherlands in 'Silver Labour Market' and Luxembourg and Norway in 'Silver Goods and Services Market'. In terms of categories in the individual dimension, Norway leads in 'Financial Security', while Sweden leads in 'healthy and active ageing' and 'participation in society'.

The design of the Senior Economy Tracker indicator and its results give greater visibility to the phenomenon of the longevity economy, identify the associated challenges and opportunities, and facilitate political, business and individual decision-making.

In short, it is an effective and robust tool for analysing the progress of the longevity economy, which makes it possible to expand the analysis of each territory and identify possible interventions by all economic agents.

Annexes

Annex I. Methodological Guide

Methodological notes

This section clarifies some aspects of the nomenclature and levels of aggregation observed in the Senior Economy Tracker.

Each indicator in the Senior Economy Tracker is identified by an alphanumeric code. The first element is a capital letter that refers to the dimension *{A, B, C, D}*. The second element is an ordinal number that serves to differentiate the categories included in each dimension. Finally, the third element, preceded by a period (.), is an ordinal number used to differentiate the indicator from the rest of the indicators included within the same dimension and category. As an example, the indicator with code B2.8 is the eighth indicator within category 2 of dimension B.

There are three different levels of aggregation. In the first, all indicators (k) in each category (j) are aggregated into a category score. At the second level, all category scores for each dimension (i) are aggregated into one dimension score. Finally, at the third level, all dimension scores are aggregated into the Senior Economy Tracker score.

The methodology consists of four stages: normalization, imputation of unavailable data, weighting, and aggregation.

Normalization and homogenization of input information

The Senior Economy Tracker is currently fed with quantitative indicators, although in future versions, it could include qualitative indicators. The following lines show how to homogenize the information to be aggregated in the Tracker.

Quantitative indicators should be standardized with the aim of translating the input information of each indicator – not comparable, as it is heterogeneous in units and scales – into comparable output information – dimensionless and on a single scale.

Among the different standardization methods available in the literature (for more details, see OECD, 2008; Freudenberg, 2003; Jacobs *et al.,* 2004), we opted for the Min-Max method because of its simplicity, efficiency, and widespread use. For example, the Min-Max has been used to calculate, among others, the Human Development Index (Anand & Sen, 1994) or the index and dashboards of the Sustainable Development Goals (Lafortune *et al.,* 2018).

With this method, the scale used usually goes between 0 and 1/10/100, with zero being the value of the indicator with the worst performance and 1/10/100 being the best performing. However, the scale will range from 1 to 100 in our case. The decision that the minimum threshold be 1 is to avoid the problems

associated with the null value in some aggregation techniques[3]. At the same time, a maximum threshold of 100 has been chosen to avoid many decimal places in the final indicator).

In cases where a higher value of the "raw/non-normalized" indicator means better performance in the evaluated field, the normalization process is carried out according to *(1)*.

$$\overline{idx}_{c,i,j,k}(t) = \left(\left(\frac{idx_{c,i,j,k}(t) - \min(idx_{i,j,k})}{\max(idx_{i,j,k}) - \min(idx_{i,j,k})}\right)\right) \cdot 99 + 1 \quad (1)$$

where:

- $idx_{c,i,j,k}(t)$ is the base indicator k, within the category j and dimension i for the country c and time sample t.
- $\overline{idx}_{c,i,j,k}(t)$ is the normalized indicator k, within the category j and dimension i for the country c and time sample t.
- $\min(idx_{i,j,k})$ is the historical minimum (period 2005-2020) of the indicator k, within the category j and dimension i for the set of countries studied.
- $\max(idx_{i,j,k})$ is the historical maximum (period 2005-2020) of the indicator k, within the category j and dimension i for the set of countries studied.

In cases where a higher value of the "raw/non-normalized" indicator implies a worse performance in the field, normalization is performed according to *(2)*.

$$\overline{idx}_{c,i,j,k}(t) = 100 - 99 \cdot \left(\frac{idx_{c,i,j,k}(t) - \min(idx_{i,j,k})}{\max(idx_{i,j,k}) - \min(idx_{i,j,k})}\right) \quad (2)$$

The maximums and minimums of each of the base indicators used for normalization are shown in Table A1.1.

3 As will be explained in the "aggregation" section, geometric aggregation multiplies the indicators that must be aggregated, raising each of them to its weight. With this aggregation technique, with only one indicator equal to zero, the aggregated indicator would also give zero (except in the case where its associated weight was also zero).

Table A1.1. Maximum and minimum values used in the normalization of the data, including the value, year and country

INDICATOR	COUNTRY	MINIMUM YEAR	VALUE	COUNTRY	MAXIMUM YEAR	VALUE
'A1.1'	Ireland	2007	33.30	Italy	2020	47.20
'A1.2'	Ireland	2007	20.30	Italy	2020	37.40
'A1.3'	Latvia	2005	70.60	Spain	2019	84.00
'A1.4'	Estonia	2005	50.40	Norway	2011	75.10
'A1.5'	Latvia	2005	21.70	Spain	2019	30.60
'A1.6'	Ireland	2011	17.20	Italy	2020	36.40
'B1.1'	Latvia	2013	3.25	Germany	2020	10.80
'B1.2'	Latvia	2005	0.02	United Kingdom	2020	0.78
'B1.3'	Greece	2005	19.60	Norway	2019	110.88
'B1.4'	Luxembourg	2020	0.70	Portugal	2020	3.77
'B2.1'	Romania	2005	485.61	Luxembourg	2020	6858.29
'B2.2'	Ireland	2006	0.16	Slovakia	2020	0.35
'B2.3'	Latvia	2008	0.30	Luxembourg	2020	1.04
'B2.4'	Luxembourg	2009	57.31	Ireland	2015	70.07
'B2.5'	Romania	2006	15.25	France	2015	26.10
'B2.6'	Romania	2007	0.00	Austria	2017	77.47
'B2.7'	Bulgaria	2008	0.00	Ireland	2020	175.13
'B2.8'	Luxembourg	2011	3.50	Latvia	2008	58.20
'C1.1'	Romania	2005	2841.00	Luxembourg	2018	58424.87
'C2.1'	Hungary	2005	28.40	Ireland	2016	47.40
'C2.2'	Croatia	2019	0.30	Romania	2020	1.00
'C2.3'	Romania	2019	0.33	Ireland	2005	37.52
'C2.4'	Luxembourg	2005	13.31	Ireland	2016	60.69
'C2.5'	Estonia	2012	0.35	Portugal	2011	1.64
'D1.1'	Finland	2015	0.32	Romania	2014	56.93
'D1.2'	Norway	2015	1.97	Romania	2014	58.26
'D1.3'	Sweden	2014	0.69	Romania	2014	39.70
'D1.4'	Slovakia	2018	2.31	Romania	2015	6.19
'D1.5'	Norway	2020	0.20	Romania	2014	34.62
'D1.6'	Greece	2011	17.60	Denmark	2018	46.90
'D1.7'	Latvia	2008	26.70	Netherlands	2019	64.80
'D1.8'	Croatia	2009	0.10	Denmark	2010	25.70
'D1.9'	Romania	2007	2.09	Norway	2019	89.33
'D2.1'	Latvia	2008	0.58	Luxembourg	2018	1.27
'D2.2'	Bulgaria	2006	29.70	Ireland	2010	93.70
'D2.3'	Bulgaria	2007	3.30	Norway	2012	94.50
'D2.4'	Bulgaria	2008	17.10	Norway	2009	100.00
'D2.5'	Bulgaria	2008	25.80	Norway	2005	100.00
'D2.6'	Czech Republic	2006	0.15	Romania	2007	37.51
'D2.7'	Norway	2009	5.90	Bulgaria	2008	96.50
'D2.8'	Norway	2011	1.60	Bulgaria	2005	87.50
'D2.9'	Luxembourg	2013	11.30	Slovakia	2006	55.60
'D2.10'	Luxembourg	2014	6.60	Greece	2014	35.60
'D2.11'	Ireland	2018	1.40	Greece	2014	33.00
'D2.12'	Slovakia	2020	3.10	Denmark	2018	9.20
'D2.13'	Slovakia	2005	6.30	Germany	2010	14.70
'D3.1'	Netherlands	2020	0.04	Romania	2011	22.42
'D3.2'	Latvia	2005	8.07	Ireland	2018	72.51
'D3.3'	Ireland	2007	24.31	Estonia	2015	76.01
'D3.4'	Slovakia	2008	31.10	Bulgaria	2007	89.99
'D3.5'	Latvia	2005	64.51	Slovenia	2009	99.80
'D3.6'	Slovakia	2008	2.80	Norway	2011	16.70
'D3.7'	Ireland	2009	8.60	Bulgaria	2008	60.40

Source: Authors.

If qualitative indicators are incorporated in future versions, they should not be standardized as they can be provided directly on the 1-100 scale on which quantitative indicators are standardized. The score for each qualitative indicator will depend on the subjective assessment of an expert/group of experts in the field. A main drawback of this type of indicators is that they are based on subjective opinions and it can be difficult to compare qualitative information from different countries/entities due to possible lack of homogeneity.

Imputation

The imputation consists of filling in the missing data from the base indicators as reliably as possible. To do this, we used two software programs that provided different approaches to the imputation challenge.

On the one hand, the *IBM SPSS statistics* software allows to impute the missing data of the indicators taking into account the information provided by the set of indicators being studied. In this way, the imputation of missing data for an indicator is carried out considering the dynamics of both the indicator (itself) and the other indicators. In particular, we have applied multivariate regression imputation (with no restrictions on the number of predictors used) and imputation by the *Expectation-Maximization method*[4].

On the other hand, Matlab software offers the possibility of imputing missing data with advanced interpolation techniques, which only consider the dynamics of the indicator itself when filling in the missing data. In particular, the *Modified Akima piecewise cubic Hermite interpolation (MAKIMA)*[5] and the *Piecewise Cubic Hermite Interpolating Polynomial (PCHIP)* [6] were used.

In order to select the optimal imputation technique, the accuracy of each one was tested in auxiliary datasets. These datasets were generated from the original dataset, deleting 20% of the original data according to three different patterns:

- Missing data in the header: the 20% of the data corresponding to the first years available for each variable was deleted.
- Missing data in the queue: the 20% of the data corresponding to the last years available for each variable was deleted.
- Missing data in random locations: the 20% of the data was extracted in random positions for each variable.

The technique that provided a better estimation in terms of the Mean Absolute Error (MAE) -defined in *(3)*- and the Mean Square Error (MSE) -defined in *(4)*- was selected.

$$\mathrm{MAE} = \frac{1}{n}\sum_{i=1}^{n}\left|\mathrm{X}_{real,i} - \mathrm{X}_{estimated,i}\right| \qquad (3)$$

4 https://www.ibm.com/docs/en/SSLVMB_27.0.0/pdf/en/IBM_SPSS_Missing_Values.pdf
5 https://es.mathworks.com/help/matlab/ref/makima.html
6 https://es.mathworks.com/help/matlab/ref/pchip.html

$$\mathrm{MSE} = \frac{1}{n}\sum_{i=1}^{n}\left(\mathrm{X}_{real,i} - \mathrm{X}_{estimated,i}\right)^2 \quad (4)$$

where X_{real} is the real value of the sample, $\mathrm{X}_{estimated}$ is the imputed value, and is the total number of imputed samples (the MAE and the MSE were only computed for the samples where the real value could be compared with the imputed value).

The consideration of both measurement errors provides a comprehensive evaluation of the imputation accuracy of each technique since MAE and MSE are complementary. While the MSE gives more importance to the atypical imputation errors (highly penalizing imputed values that are very different from the real ones), the MAE focuses on the overall error without giving so much importance to the atypical imputation errors.

The results from the tests determined that multivariate regression imputation provided the lowest MAE and MSE. Consequently, this was the imputation technique selected.

Weighting

In the aggregation procedure used to generate composite indicators, weighting factors are required at all levels of aggregation. According to Lafortune *et al.* (2018), there are four main approaches to designing weighting factors:

- Equal weights: Most composite indicators use this approximation for weighting, which means, broadly speaking, that all elements are of equal importance. According to the OECD (2008), this option makes sense if there is not enough knowledge about causal relationships or there is a lack of consensus on which indicators are more important and which are less important. However, care must be taken with this technique, particularly with highly correlated indicators. Utilizing it in such contexts may result in "double-counting" or "overweighting" of the element or phenomenon that these correlated indicators are intended to represent.

- Statistical/mathematical weights: This technique solves the problem related to "overweighting" presented in the previous paragraph. According to OECD (2008), statistical weights can be used to group base indicators according to their level of correlation.

- Expert weights: This method, also known as the Budget Allocation Process (BAP) (Moreira *et al.,* 2018; Zhou *et al.,* 2010), consists of a panel of experts who must distribute a total score (usually 100 points) among the different indicators. Its main advantages are transparency and easy implementation. However, in addition to the difficulty of finding the right group of experts, this method loses reliability as the number of indicators among which the score must be distributed increases, and its application is not recommended in any case if the number of indicators is greater than 10 (OECD, 2008).

- Subjective/flexible weights: This method has been used to construct composite indicators such as the OECD Better Life Index (Durand, 2015) and allows for sensitivity analyses that may be of great interest to administrations. In our view, to successfully apply this technique, it is essential to limit the number of indicators, similar to the approach taken with the Budget Allocation Process (BAP) technique. An excessive number of indicators could compromise the technique's effectiveness.

Other methods derived from Multi-Criteria Decision Analysis (MCDA), such as data envelopment analysis (DEA), do not require weights to be decided because they are automatically generated through an optimization procedure (Chen & Delmas, 2011; Capelle-Blancard, & Petit, 2017). However, we dismiss the DEA method as its complexity can pose comprehension challenges for non-specialists (Capelle-Blancard & Petit, 2017) and this lack of accessibility conflicts with one of the primary objectives of the Senior Economy Tracker, which is to ensure ease of understanding for its users.

Drawing from the discussions in the preceding paragraphs, we have resolved to apply mathematical weights at the first level of aggregation (from base indicators to category indicators). This decision is driven by two factors: firstly, some categories comprise more than ten base indicators, precluding the application of either expert judgment or flexible criteria. Secondly, from a conceptual standpoint, the indicators within each category are closely interrelated. Therefore, employing a factor model to determine the weights appears to be a suitable approach. Furthermore, a prerequisite for the application of this method is that all indicators must be in the same unit of measurement. This requirement is satisfied thanks to the normalization process.

The steps for the calculation of statistical weights, based on Principal Component Analysis (PCA) and Factor Analysis (FA), are presented below.

1. Prepare the input dataset individually for each category. If necessary, the input values after the account assignment should be corrected as follows: imputed values below 1 will be assigned a value equal to 1. The structure of the data matrix needed to obtain the statistical weights is a matrix with as many rows as the number of countries times the number of years (the complete time series of each country is concatenated by rows) and as many columns as the number of base indicators. Therefore, its dimension is $[C \cdot T \; x \; K_{i,j}]$, being C the total number of countries, T the total number of time samples, and $K_{i,j}$ the total number of base indicators existing in the category j belonging to dimension i.

2. It is common for the variables considered in this study to present non-stationary dynamics. In particular, steady increments over time. In order to analyze the linear correlation between two non-stationary variables, it is recommended to apply a transformation to the input data. This transformation is carried out by calculating the rate of change. The rate of change between two consecutive samples can be calculated from Equation *(5)*:

$$V\left(idx_{c,i,j,k}(t), idx_{c,i,j,k}(t+1)\right) = \frac{idx_{c,i,j,k}(t+1) - idx_{c,i,j,k}(t)}{idx_{c,i,j,k}(t)} \approx \log\left(idx_{c,i,j,k}(t+1)\right) - \log\left(idx_{c,i,j,k}(t)\right) \qquad (5)$$

3. Calculate the correlation matrix from the rate of change of the input dataset. In case there are countries where the complete time series for a given base indicator is empty and therefore the missing data cannot be imputed, these values are not considered for the calculation of the level of correlation between base indicators. This means that only samples in which both base indicators have valid values are considered in the calculation of correlations. The resulting correlation matrix is a square matrix of dimension equal to the number of indicators in the associated category, i.e. $[K_{i,j} \; x \; K_{i,j}]$.

4. Compute eigenvectors and their corresponding eigenvalues from the correlation matrix. For a category j , belonging to the dimension i, the total number of eigenvectors and eigenvalues obtained is the same as the number of variables, $K_{i,j}$.

   Each eigenvector l in the category j (which, in turn, belongs to the dimension i), will be named as $\eta_{i,j,l}$, and each eigenvalue will be named as $\lambda_{i,j,l}$. Where, $|\eta_{i,j,l}| = 1$ and, consequently, $|\lambda_{i,j,l}|$ is proportional to the total percentage of the variance explained by each $\eta_{i,j,l}$. In addition, it should be noted that each eigenvector is a vector composed of as many scalars as there are base indicators in the category j; thus, its dimension is $[K_{i,j} \; x \; 1]$.

The total percentage of the variance explained by each eigenvector l ($\lambda'_{i,j,l}$) is calculated from the Equation *(6)*:

$$\lambda'_{i,j,l} = \frac{\lambda_{i,j,l}}{\sum_{l=1}^{K_{i,j}} \lambda_{i,j,l}} \cdot 100 \quad (6)$$

5. Select the minimum number of eigenvectors needed to explain a given percentage of the total variance, usually 90%. To do this, the cumulative sum of $\lambda'_{i,j,l}$ (ordered in descending order) is used, which allows us to identify the minimum number of eigenvectors within the category j and dimension i ($M_{i,j}$) that allow us to explain this percentage of the total variance, as indicated in the Equation *(7)*:

$$\sum_{l=1}^{M_{i,j}} \lambda'_{i,j,l} \geq 90 \,, subject\ to\ M_{i,j} \leq K_{i,j} \quad (7)$$

The most representative eigenvectors $M_{i,j}$ are scaled with respect to their explained variance ($|\eta_{i,j,l}| = \lambda'_{i,j,l}$) before applying a Varimax rotation of themselves. The scaling of the set of eigenvectors allows us to obtain the variance explained from the new rotated eigenvectors, hereinafter called factors and represented by the subindex m. The Varimax rotation makes it possible to better explain the relationships between the variables that make up the factors and minimize the correlation between them. These factors represent "groups" of variables with a high correlation between them. The M rotated factors are ${\eta_{i,j,l}}^{rot}$, the modulus of which corresponds to their percentage of the total explained variance, $|{\eta_{i,j,m}}^{rot}| = {\lambda'_{i,j,m}}^{rot}$, and the sum of the total explained variance is the same as the variance of the unrotated factors $\sum_{l=1}^{M_{i,j}} \lambda'_{i,j,l} = \sum_{m=1}^{M_{i,j}} {\lambda'_{i,j,m}}^{rot}$, but the variance explained by each rotated factor may be different before and after the rotation.

6. Calculate the local and global weights associated with each indicator. This is done from the information provided by the rotated factors.

The local weight of an indicator belonging to the category and dimension (belongs to the largest of its associated factor loads. As explained above, each eigenvector, which after selection and rotation is called a factor, is composed of as many scalars as there are base indicators in the category. These scalars are called factor loads, and each of them is associated with a base indicator. The structure of a factor is determined by the equation *(8)*.

$${\eta_{i,j,m}}^{rot} = [f_{i,j,1,m}, f_{i,j,2,m}, \dots, f_{i,j,k,m}, \dots f_{i,j,K_{i,j},m}]' \quad (8)$$

where $f_{i,j,k,m}$ is the factor load of the base indicator k for the factor m, within the category j and dimension i. Therefore, $\alpha_{i,j,k,local}$ it is calculated according to the equation *(9)*.

$$\alpha_{i,j,k,local} = \max\left(f_{i,j,k,m}\right), m \in \{1,2, \dots, M\} \quad (9)$$

The overall weight associated with an indicator belonging to the category and dimension , corresponds to the percentage of the variance explained by the factor to which the indicator is associated, which is the factor with the largest factor load for the indicator. This is shown in *(10)*.

$$\alpha_{i,j,k,global} = {\lambda'_{i,j,x}}^{rot}, with\ x\ subject\ to\ f_{i,j,k,x} = \max\left(f_{ij,k,m}\right), m \in \{1,2, \dots, M\} \quad (10)$$

7. The final weight assigned to each base indicator k, belonging to the category j and dimension i, is calculated as a combination of local and global weights according to the equation *(11)*.

$$\alpha_{i,j,k} = \frac{\alpha_{i,j,k,local} \cdot \alpha_{i,j,k,global}}{\sum_{k=1}^{K_{i,j}} (\alpha_{i,j,k,local} \cdot \alpha_{i,j,k,global})} \quad (11)$$

Finally, we note that the weights of the total number of indicators within a category must add up to one, as indicated in the equation *(12)*.

$$\sum_{k=1}^{K_{i,j}} \alpha_{i,j,k} = 1 \quad (12)$$

The values of the weights obtained for each base indicator grouped by category are shown in Tables A2.1 (Social), A2.2 (Institutional), A2.3 (Macroeconomic) and A2.4 (Individual) in Annex III. More specifically, the values of $\alpha_{i,j,k}$ are displayed in the columns with the name "indicator weight (category)."

At the second level of aggregation, we have employed equal weighting. This decision stems from the observation that no clear evidence suggests that certain categories are more significant than others within the same dimension. Therefore, the only requirement that must be met (in addition to equal weighting) is that the sum of the weighting factors within each dimension must be one. Both requirements (equiponderance and total sum equal to one) are expressed in *(13)*.

$$\alpha_{i,j} = \frac{1}{N_i} \quad (13)$$

where:

- $\alpha_{i,j}$ is the weighting factor associated with the category within dimension .
- N_i is the number of categories within dimension.
- N is the number of dimensions

Finally, the BAP expert criterion has been chosen at the third level of aggregation, considering that the macroeconomic dimension should have more weight than the others. Bearing in mind that the social dimension is not aggregated but used to calculate the correction factor that will be explained below, the weights used at the last level of aggregation have been set in such a way that the macroeconomic dimension has twice the weight of the other two dimensions, which in turn have the same weight:

- Institutional dimension weight (α_B): 0.25.
- Weight of macroeconomic dimension (α_C): 0.5.
- Individual dimension weight (α_D): 0.25.

Aggregation

Deciding the level of substitutability among indicators (first level of aggregation), category scores (second level of aggregation) and dimension scores (third level of aggregation) is crucial to choosing the most appropriate aggregation technique to apply at each level of aggregation. We have used the standard Constant Elasticity of Substitution (CES) function (Arrow *et al.*, 1961; Lafortune *et al.*, 2018) shown in *(14)* to aggregate the indexes (for the sake of clarity, the nomenclature used corresponds to the third level of aggregation).

$$I_c(t) = \left(\sum_{i=1}^{N} \left(\alpha_i \cdot I_{c,i}(t)^{\rho} \right) \right)^{1/\rho} \quad (14)$$

where:

- $I_c(t)$ is the Senior Economy Tracker score for the country c and time sample t.
- α_i is the weighting factor associated with the dimension i.
- $I_{c,i}(t)$ is the dimension score for the country c and time sample t.
- ρ is the substitution parameter, whose relation to the elasticity of substitution, σ, is determined by *(15)*. It should be noted that ρ can vary in the interval [1, –∞] and, therefore, σ can vary in the interval [0, ∞].

$$\sigma = \frac{1}{1-\rho} \quad (15)$$

At the first level of aggregation, absolute substitutability ($\sigma = \infty$ and $\rho = 1$) has been considered among indicators within the same category. As explained in Lafortune *et al.* (2018), a regress in one indicator can be offset by an advance in another indicator, which converts the CES function into a weighted average, which is the most widespread linear aggregation method (OECD, 2008). Therefore, aggregation at this level is done according to *(16)*.

$$I_{c,i,j}(t) = \sum_{k=1}^{N_{i,j}} \left(\alpha_{i,j,k} \cdot \overline{idx}_{c,i,j,k}(t) \right) \quad (16)$$

where $I_{c,i,j}(t)$ is the score of the category j within the dimension i for the country c and time sample t. It must be in the range [1,100].

At the second level of aggregation, an intermediate case of linear substitutability ($\sigma = 1$ and $\rho = 0$) has been considered. In these cases, the CES function is transformed into the Cobb-Douglas production function, resulting in a geometric aggregation. The OECD (2008) makes two interesting considerations about the relationship between linear ($\rho = 1$) and geometric ($\rho = 0$) aggregation. First, countries or entities "with low scores in some individual indicators would prefer a linear rather than a geometric aggregation." Second, a country or entity "would have a greater incentive to address those sectors with low scores if the aggregation were geometric rather than linear," since "the marginal utility of an increase in the score would be much higher when the absolute value of the score is low" (OECD, 2008: 104). Additionally, Lafortune *et al.* (2018:24) give a third interesting consideration: geometric aggregation "is often used to aggregate heterogeneous variables with limited substitutability and in cases where the focus of the analysis is on percentage changes instead of absolute changes." Consequently, geometric aggregation fits perfectly into the second level of aggregation, in which the aggregated categories have a reduced – but not zero – substitutability and in which it is important to highlight and penalize large mismatches between categories within the same dimension. Consequently, the aggregation is performed according to *(17)*.

$$I_{c,i}(t) = \prod_{j=1}^{N_i} \left(I_{c,i,j}(t)^{\alpha_{i,j}} \right) \quad (17)$$

where $I_c(t)$ is the dimension i score for the country c and time sample t. It must be in the interval [1,100].

Last, at the third level of aggregation, substitutability between categories is also limited since the holistic approach of the Senior Economy Tracker, especially at this level of aggregation, forces us not to ignore any of the dimensions represented nor to consider a large trade-off between dimensions acceptable. One option is to assume zero substitutability in the CES function (σ = 0 and ρ = -∞). In these cases, the CES function becomes a Leontief function given by *(18)*, which means that the output value is equal to the value of the worst of the indices being aggregated.

$$I_c(t) = Min\left\{I_{c,i}(t)\right\} \tag{18}$$

However, Leontief's role has been discarded, as it is very restrictive and only focuses on the "worst" dimensions of the country. Therefore, for the third level of aggregation, geometric aggregation has also been selected to obtain the Senior Economy Tracker score for each country and time sample t ($I_c(t)$). While it is true that a lower substitutability could have been chosen by selecting a value for the substitution parameter (ρ) between 0 (geometric aggregation) and -∞ (Leontief function), geometric aggregation has been chosen for the sake of clarity and simplicity that we are looking for with the Senior Economy Tracker.

Therefore, the formula for obtaining the Senior Economy Tracker from the dimension scores is determined by *(19).*

$$I_c(t) = \left(\prod_{i\epsilon\{B,C,D\}} \left(I_{c,i}(t)^{\alpha_i}\right)\right) \cdot fcorr \tag{19}$$

where $I_c(t)$ is the score for the country and time sample . It should be noted that at the latter level of aggregation, only dimensions B, C and D are aggregated, while dimension A is used to calculate a correction factor ($f\ corr$) that allows the "pressure" exerted by the demographic/social factor associated with that dimension to be taken into account. In this way, between two countries that have the same values in dimensions B, C and D, the country with a higher value of A and, therefore, with a longer-lived society (higher life expectancy, higher average age...) will be in a worse position, since its demographic structure forces it to adapt faster than others with a less long-lived society. The final formula to compute the Senior Economy Tracker, including details on the correction factor, is indicated in *(20)*.

$$I_c(t) = \left(I_{c,B}(t)^{\alpha_B} \cdot I_{c,C}(t)^{\alpha_C} \cdot I_{c,D}(t)^{\alpha_D}\right) \cdot \frac{I_{c,B}(t) + I_{c,C}(t) + I_{c,D}(t)}{I_{c,A}(t) + I_{c,B}(t) + I_{c,C}(t) + I_{c,D}(t)} \tag{20}$$

Scenarios for sensitivity analysis

The sensitivity analysis proposes three alternative scenarios to the base scenario for calculating the Senior Economy Tracker. These scenarios make it possible to analyze variations in the final indicator in the face of methodological changes. The alternative scenarios observed correspond to the most possible and reasonable modifications in methodological decisions (although we consider that the best decisions, from the methodological point of view, are those contained in the base scenario): the application of arithmetic aggregation at all levels of aggregation and the application of equal weights at the third level of aggregation.

Therefore, in the scenarios proposed for the sensitivity analysis, the changes compared to the base scenario occur from the second level of aggregation:

- In the "*geometric and equal weighting" scenario,* theweights used in the third level of aggregation are equally distributed.

- In the *" arithmetic and unequal weighing*" scenario, the aggregation of the category scores into dimension scores, as well as the aggregation of the dimension scores into the final indicator, is arithmetic.

Regarding the weighting, in the second level of aggregation all the categories within a dimension have equal weights, while in the third level of aggregation, the macroeconomic dimension has twice as much weight as the others (in terms of weighting this scenario is equal to the baseline).

- In the *"arithmetic and equal weighting"* scenario, the aggregation of the category scores into dimension scores, as well as the aggregation of the dimension scores in the final indicator, is arithmetic, and in all cases, the weights are equal.

The Table A1.2 summarizes the differences between scenarios.

Table A1.2. Summary of Scenarios Used in Sensitivity Analysis

	SECOND LEVEL OF AGGREGATION		THIRD LEVEL OF AGGREGATION	
Scenario	**Weighting**	**Aggregation**	**Weighting**	**Aggregation**
Base	Equal weights	Geometric	BAP $\alpha_B = 0.25$, $\alpha_C = 0.5$, $\alpha_D = 0.25$	Geometric
Geometric and equal weighting	Equal weights	Geometric	Equal weights	Geometric
Arithmetic and unequal weighing	Equal weights	Arithmetic	BAP $\alpha_B = 0.25$, $\alpha_C = 0.5$, $\alpha_D = 0.25$	Arithmetic
Arithmetic and equal weighting	Equal weights	Arithmetic	Equal weights	Arithmetic

Source: Authors.

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The incorporation of new data available in future years may lead to variations both in the statistical weights (applied at the first level of aggregation) and in the maximum and minimum values (normalization). To mitigate the impact of these updates on the final result of the indicator, we suggested maintaining the statistical weights and the maximum and minimum values recorded in the period 2005-2020, included in Table *A1.1* (maximum and minimum values); and Table A2.1, A2.2, A2.3 and A2.4 (statistical weights).

Annex II. Statistical weights used at the first level of aggregation

Tables A2.1, A2.2, A2.3 and A2.4 show the weights assigned to each base indicator based on the factor loadings corresponding to the Social dimension (A); Institutional (B); Macroeconomic (C) and Individual (D), respectively.

A factor is a representation of the correlations between a set of observed variables. The concept of statistical weights, or factor loadings, refers to the importance of each variable within each factor, and is obtained using the statistical method of factor analysis. The membership of a variable to a factor is determined by the factor in which it has attained the greatest weight. Therefore, those factors in which the variables are less significant (i.e., they have a weaker relationship with respect to the rest of the variables) have been marked with " ~ ". The weight assigned to each group of variables (factors) has also been statistically determined. The weight of each variable within the category [Indicator Weight (CATEGORY)] is determined by its weight within the factor and by the weight assigned to that factor. The sum of all the weights of the variables within the same category is normalized to 100%. Finally, the weight of each variable within the total indicator [Indicator Weight (TOTAL)] is defined by its weight within the category [Indicator Weight (CATEGORY)], the weight of the dimension to which each category belongs [Weight Category], and by the weight of the dimension within the total indicator [Weight Dimension]. The sum of the total weights [Indicator Weight (TOTAL)] is 100%.

Table A2.1. Statistical Weights Social Dimension (A)

DIMENSION	DIMENSION WEIGHT	CATEGORIES	CATEGORY WEIGHT	BASE INDICATORS	INDICATOR WEIGHT (FACTORS)				INDICATOR WEIGHT (CATEGORY)	INDICATOR WEIGHT (TOTAL)
					F. 1	*F. 2*	*F. 3*	*F. 4*		
					(33.2%)	*(17.6%)*	*(17.3%)*	*(31.8%)*		
Social	~	**A1 Demographic transition**	**100%**	A1.1	47%	~	~	~	16%	
				A1.2	48%	~	~	~	17%	
				A1.3	~	~	~	48%	16%	
				A1.4	~	95%	~	~	18%	
				A1.5	~	~	~	47%	16%	
				A1.6	~	~	97%	~	18%	
									100%	

Source: Authors.

Table A2.2. Statistical Weights Institutional Dimension (B)

DIMENSION	DIMENSION WEIGHT	CATEGORIES	CATEGORY WEIGHT	BASE INDICATORS	INDICATOR WEIGHT (FACTORS)					INDICATOR WEIGHT (CATEGORY)	INDICATOR WEIGHT (TOTAL)
					F. 1	*F. 2*	*F. 3*				
					(43.7%)	*(28.1%)*	*(28.1%)*				
		B1. Health and social protection	**50%**	B1.1	49%	~	~			22%	2.71%
				B1.2	50%	~	~			22%	2.80%
				B1.3	~	99%	~			28%	3.51%
				B1.4	~	~	98%			28%	3.48%
										100%	12.50%
					F. 1	*F. 2*	*F. 3*	*F. 4*	*F. 5*		
Institutional	**25%**				*(22.2%)*	*(19.4%)*	*(20.4%)*	*(22.9%)*	*(15.1%)*		
		B2. Pensions and labour protection	**50%**	B2.1	~	63.90%	~	~	~	14%	1.77%
				B2.2	~	~	~	~	91.01%	15.62%	1.95%
				B2.3	51.31%	~	~	~	~	13.00%	1.63%
				B2.4	~	~	~	50.11%	~	13.10%	1.64%
				B2.5	~	~	~	41.67%	~	10.90%	1.36%
				B2.6	~	~	36.88%	~	~	8.58%	1.07%
				B2.7	~	~	59.56%	~	~	13.85%	1.73%
				B2.8	42.69%	~	~	~	~	10.82%	1.35%
										100%	12.50%

Source: Authors.

Table A2.3. Statistical Weights Macroeconomic Dimension (C)

DIMENSION	DIMENSION WEIGHT	CATEGORIES	WEIGHT CATEGORY	BASELINE INDICATORS	INDICATOR WEIGHT (FACTORS)				INDICATOR WEIGHT (CATEGORY)	INDICATOR WEIGHT (TOTAL)
		C1. Senior Goods & Services Market	**50%**		***F. 1***					
					100%					
				C1.1	100%				100%	25.00%
									100%	25.00%
					F. 1	***F. 2***	***F. 3***	***F. 4***		
					(31.2%)	***(23.6%)***	***(22.5%)***	***(22.6%)***		
Macroeconomic	**50%**	**C2. Senior Labour Market**	**50%**	C2.1	48%	~	~	~	16%	4.06%
				C2.2	~	~	~	92%	22%	6%
				C2.3	~	85%	~	~	21%	5%
				C2.4	52%	~	~	~	17%	4%
				C2.5	~	~	93%	~	23%	5.66%
									100%	25.00%

[1] Average consumption per person represents the sum of expenditure relating to: food and non-alcoholic beverages, alcoholic beverages, tobacco and narcotics, clothing and footwear, housing, water, electricity, gas and other fuels, furniture, household equipment and ordinary maintenance of housing, health, transport, communications, leisure and culture, education, restaurants and hotels, miscellaneous goods and services. Purchasing power parity (PPP) makes it possible to compare economic indicators between several countries, converting their value (in national currency) to PPP values. Purchasing power theory predicts that the same good available in several countries should have the same price once adjusted for the exchange rate. In this way, consumers will always maintain the same purchasing power.
*Source: Eurostat.

Table A2.4. Statistical Weights Individual Dimension (D)

DIMENSION	DIMENSION WEIGHT	CATEGORIES	WEIGHT CATEGORY	BASELINE INDICATORS	INDICATOR WEIGHT (FACTORS)							INDICATOR WEIGHT (CATEGORY)	INDICATOR WEIGHT (TOTAL)
					F. 1	*F. 2*	*F. 3*	*F. 4*	*F. 5*	*F. 6*			
					(33.5%)	*(13.4%)*	*(13.7%)*	*(13.0%)*	*(13.2%)*	*(13.2%)*			
				D1.1	25%	~	~	~	~	~		9%	0.77%
				D1.2	27%	~	~	~	~	~		10%	0.84%
				D1.3	16%	~	~	~	~	~		6%	0.50%
		D1. Social Participation	**33.3%**	D1.4	~	76%	~	~	~	~		11%	0.92%
				D1.5	30%	~	~	~	~	~		11%	0.92%
				D1.6	~	~	~	~	~	93%		13%	1.12%
				D1.7	~	~	~	93%	~	~		13%	1.10%
				D1.8	~	~	83%	~	~	~		12%	1.04%
				D1.9	~	~	~	~	93%	~		14%	1.13%
												100%	8.33%
					F. 1	*F. 2*	*F. 3*	*F. 4*	*F. 5*	*F. 6*	*F. 7*		
					(25.4%)	*(13.6%)*	*(9.6%)*	*(12.8%)*	*(9.7%)*	*(12.8%)*	*(16.1%)*		
				D2.1	~	~	~	~	~	~	47%	10%	0.84%
				D2.2	~	~	~	~	~	45%	~	8%	0.64%
				D2.3	~	~	~	~	~	~	25%	5%	0.45%
				D2.4	27%	~	~	~	~	~	~	9%	0.76%
				D2.5	30%	~	~	~	~	~	~	10%	0.85%
Individual	**25 %**	**D2. Financial Security**	**33.3%**	D2.6	~	~	77%	~	~	~	~	10%	0.82%
				D2.7	~	~	~	17%	~	~	~	3%	0.25%
				D2.8	20%	~	~	~	~	~	~	7%	0.56%
				D2.9	~	55%	~	~	~	~	~	10%	0.83%
				D2.10	~	36%	~	~	~	~	~	6%	0.54%
				D2.11	~	~	~	~	75%	~	~	10%	0.80%
				D2.12	~	~	~	~	15%	~	~	2%	0.16%
				D2.13	~	~	~	60%	~	~	~	10%	0.85%
												100%	8.33%

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Table A2.4. Statistical Weights Individual Dimension (D)

DIMENSION	DIMENSION WEIGHT	CATEGORIES	WEIGHT CATEGORY	BASELINE INDICATORS	INDICATOR WEIGHT (FACTORS)					INDICATOR WEIGHT (CATEGORY)	INDICATOR WEIGHT (TOTAL)
					F. 1	*F. 2*	*F. 3*	*F. 4*	*F. 5*		
					(29.2%)	*(25.1%)*	*(15.1%)*	*(15.5%)*	*(15.1%)*		
Individual	**25 %**	**D3. Healthy and active ageing**	**33.3%**	D3.1	~	~	~	~		15%	1.26%
				D3.2	~	48%	~	~	~	12%	1.03%
				D3.3	~	~	~	94%	~	15%	1.25%
				D3.4	49%	~	~	~	~	15%	1.22%
				D3.5	~	50%	~	~	~	13%	1.07%
				D3.6	50%	~	~	~	~	15%	1.23%
				D3.7.	~	~	98%	~	~	15%	1.27%
										100%	8.33%

Source: Authors.

Annex III. Results by dimension and category. Data by country and year

Table A3.1. Social Dimension. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	54.68	56.91	56.18	57.49	58.30	62.08	65.50	65.40	67.19	68.41	67.17	70.98	73.51	73.31	76.62	69.93
Portugal	42.66	47.31	49.12	50.74	49.43	52.91	58.41	61.15	62.22	59.18	59.03	61.03	62.24	62.24	64.06	62.34
France	53.22	53.51	54.90	55.95	57.58	59.75	64.43	63.74	64.91	66.02	64.50	64.77	64.96	65.28	65.91	63.79
Austria	50.62	53.03	54.21	55.18	56.05	57.43	60.01	61.45	60.97	60.75	60.22	60.91	60.99	61.41	62.99	62.06
Belgium	51.93	53.05	54.95	55.05	56.97	57.99	60.51	60.64	60.51	62.70	61.84	62.67	62.93	63.05	63.39	60.59
Czech Rep.	41.87	43.62	43.57	49.70	47.15	51.22	54.88	55.04	55.16	57.15	55.33	56.54	54.78	55.34	55.52	51.97
Denmark	53.79	52.68	53.30	50.85	50.90	52.57	56.55	56.59	56.24	57.68	56.33	57.20	57.41	57.94	57.87	57.97
Finland	46.16	45.18	49.20	49.03	50.14	57.53	60.06	58.94	59.18	59.86	59.40	58.89	58.82	58.64	58.62	58.65
Germany	50.21	42.22	44.04	43.02	42.57	44.33	45.09	52.42	59.95	45.80	50.10	50.61	51.73	51.54	52.41	60.39
Greece	53.65	54.04	53.31	52.39	54.65	60.52	62.39	60.97	63.37	63.61	62.51	64.32	64.30	66.59	66.87	65.93
Hungary	27.31	32.65	35.41	37.77	38.72	40.19	43.85	46.66	47.75	48.24	46.79	48.48	48.00	48.85	49.62	47.36
Ireland	42.99	45.21	46.19	47.80	50.31	52.34	56.26	56.68	57.08	58.47	59.01	60.71	62.64	63.78	65.64	63.50
Italy	60.60	59.85	58.51	58.82	61.35	65.52	66.09	65.07	66.52	68.14	66.94	72.77	71.60	73.69	75.86	72.33
Luxembourg	53.24	52.95	54.16	58.16	59.69	60.03	62.03	62.79	62.44	63.67	62.88	62.55	60.66	62.41	64.96	63.91
Netherlands	52.84	54.17	56.36	54.62	56.11	57.14	61.90	61.22	60.44	62.94	60.60	61.91	62.22	61.73	63.92	61.74
Norway	56.17	56.44	56.21	59.44	60.49	63.04	68.17	65.37	65.11	66.92	66.70	66.76	67.92	67.93	68.16	68.46
Poland	40.34	39.60	40.32	42.71	43.76	46.08	50.67	50.92	51.81	54.22	53.68	55.90	54.43	54.14	54.75	49.83
Slovakia	31.12	31.58	34.11	33.49	35.26	36.59	40.34	42.10	44.10	46.17	45.72	48.43	47.69	48.37	49.46	47.58
Sweden	56.16	59.36	60.22	59.31	60.76	61.99	63.55	62.98	63.07	68.40	67.51	67.91	67.48	67.42	69.16	66.56
UK	53.08	53.58	53.98	54.85	57.48	58.33	60.63	59.75	59.70	59.88	58.61	58.84	58.70	57.86	59.18	55.16
Estonia	28.71	30.29	32.00	36.84	40.55	41.79	45.86	45.92	47.60	47.54	48.49	49.83	49.90	48.51	50.99	51.84
Slovenia	44.13	47.50	50.65	52.91	55.95	51.86	55.25	57.43	59.84	61.88	60.86	62.09	59.26	60.41	64.20	63.88
Latvia	22.90	23.82	25.01	29.21	32.17	34.91	39.16	41.44	39.74	40.89	41.24	41.95	40.65	41.59	43.91	43.24
Lithuania	24.11	25.63	26.82	31.25	36.38	38.07	41.59	43.13	44.05	46.56	44.05	46.35	48.81	49.57	51.07	46.85
Bulgaria	40.01	41.34	43.32	40.35	42.76	45.48	48.83	48.89	50.39	48.95	48.23	50.18	49.13	50.25	51.09	46.27
Croatia	41.60	41.99	42.28	44.26	45.72	47.49	51.43	53.65	52.32	52.98	49.73	52.95	52.37	52.99	53.93	51.96
Romania	26.67	31.51	33.95	37.84	40.37	40.66	42.33	42.44	45.09	45.58	44.95	45.82	45.26	45.49	46.68	41.97

Source: Authors.

Table A3.2. Institutional Dimension. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	28.90	28.82	29.59	29.86	32.40	33.41	34.33	35.54	36.42	37.31	38.02	37.84	38.74	39.34	39.96	45.60
Portugal	40.44	41.86	41.21	43.30	45.30	44.31	44.63	45.70	45.52	46.11	46.42	47.44	47.87	47.69	48.53	50.84
France	42.95	43.75	44.46	46.04	48.67	49.16	49.12	49.72	50.95	51.67	51.72	49.47	49.49	49.53	48.38	52.18
Austria	43.06	42.14	42.47	42.33	43.97	45.41	45.25	46.32	47.13	47.75	48.06	47.95	48.60	48.43	48.31	51.83
Belgium	36.71	36.03	36.62	37.83	40.00	41.36	41.49	42.29	43.39	44.00	45.02	45.35	45.91	46.71	46.65	47.92
Czech Rep.	20.89	21.08	21.25	23.67	25.91	27.58	27.95	28.28	28.28	29.14	27.76	28.27	28.33	27.96	27.91	32.84
Denmark	47.51	46.84	49.20	50.73	54.81	55.60	55.73	55.94	56.24	57.28	57.60	57.11	57.33	57.38	57.75	60.85
Finland	42.82	42.01	42.26	43.46	46.59	47.66	46.57	48.09	49.22	49.52	51.20	51.82	51.72	51.91	51.55	54.85
Germany	44.87	44.47	44.46	45.32	45.82	45.97	46.14	46.17	46.40	46.30	47.48	47.78	48.41	49.09	49.35	51.25
Greece	32.64	31.46	31.76	33.05	34.56	35.12	35.22	35.55	35.96	36.20	37.24	37.89	36.72	37.37	37.81	43.07
Hungary	34.67	33.79	33.06	32.92	33.61	34.28	34.29	31.35	31.47	31.13	30.86	32.17	30.56	29.64	28.74	30.59
Ireland	31.42	30.05	31.83	34.94	38.58	40.96	42.42	43.21	43.06	41.81	35.77	35.45	34.54	33.23	33.68	34.43
Italy	35.59	36.68	35.41	36.70	38.06	38.36	38.53	41.03	41.48	42.13	42.95	42.81	43.65	44.56	44.12	48.14
Luxembourg	35.51	33.84	32.70	32.31	36.43	36.63	36.87	34.63	35.86	37.10	36.70	36.84	37.01	38.76	39.97	45.70
Netherlands	46.28	42.13	42.70	44.26	47.14	48.23	48.77	50.08	50.04	50.18	49.73	48.87	48.58	48.96	47.85	52.24
Norway	41.14	40.16	41.73	41.97	44.81	44.58	45.73	46.94	47.81	49.86	52.43	53.84	53.03	53.27	54.84	55.98
Poland	25.50	25.98	26.01	27.10	28.03	27.60	26.80	27.39	29.29	28.84	29.31	30.77	30.34	28.60	28.69	28.66
Slovakia	23.63	28.19	30.15	28.50	31.82	33.33	28.55	30.72	28.34	24.80	25.21	24.54	23.90	23.13	23.59	26.95
Sweden	44.30	45.05	46.14	46.48	47.78	46.19	50.01	50.99	52.21	52.86	53.15	53.63	53.58	54.03	52.49	54.57
UK	43.39	41.81	41.67	41.02	46.62	47.73	48.38	49.86	48.77	48.32	48.56	48.68	48.90	49.40	49.40	56.44
Estonia	21.08	19.39	19.58	22.93	27.37	29.30	27.38	27.38	27.75	27.54	28.45	28.88	29.19	28.95	29.82	33.59
Slovenia	33.99	33.07	33.06	33.70	36.13	36.91	37.82	37.18	38.20	37.79	37.62	37.59	37.06	37.64	37.35	40.63
Latvia	25.55	24.31	21.11	19.62	23.08	28.03	27.89	26.68	24.01	24.69	25.10	27.67	27.27	27.50	28.16	31.47
Lithuania	25.36	24.43	22.71	23.86	27.47	28.19	27.92	27.27	27.35	27.81	29.25	30.11	29.49	29.85	32.89	33.26
Bulgaria	28.14	28.68	28.12	28.45	28.12	31.67	31.39	32.66	30.47	32.64	31.48	33.28	31.95	31.89	30.34	32.67
Croatia	24.48	23.39	24.31	25.07	25.07	25.65	25.58	25.48	22.23	24.25	24.69	25.17	25.43	25.57	25.74	28.97
Romania	24.80	21.25	21.28	21.65	26.81	26.81	15.56	15.26	18.90	18.19	17.97	18.23	18.63	18.84	18.88	21.86

Source: Authors.

Table A3.3. Macroeconomic Dimension. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	29.07	31.47	32.73	32.90	32.67	35.74	37.22	36.61	35.34	35.15	37.18	37.62	39.11	40.33	42.25	40.12
Portugal	32.50	33.83	35.25	35.70	36.08	38.44	39.33	37.47	37.35	34.95	39.49	39.88	40.86	41.78	43.15	41.32
France	35.34	37.57	36.98	38.53	38.95	38.41	38.97	38.83	37.07	37.59	40.47	40.96	41.16	42.13	41.79	41.70
Austria	34.97	38.92	40.74	41.43	41.82	42.19	43.74	43.26	45.25	43.53	45.97	46.94	46.69	50.53	51.50	50.79
Belgium	35.86	34.67	34.72	34.37	38.54	39.56	41.10	41.09	41.33	40.80	42.39	41.76	42.29	46.63	45.29	39.53
Czech Rep.	19.63	21.04	21.30	23.40	22.16	22.02	21.19	24.67	23.75	25.32	25.20	26.10	28.09	29.97	30.75	29.69
Denmark	37.16	38.93	42.50	41.92	41.62	45.19	44.40	46.24	49.05	48.05	46.12	47.84	49.53	52.07	52.35	50.34
Finland	35.17	36.90	38.85	40.83	40.23	41.35	41.86	41.95	42.61	41.59	45.72	45.42	46.63	50.06	50.37	48.59
Germany	33.64	34.19	36.57	36.08	36.80	35.89	37.13	38.21	39.15	40.10	39.78	41.15	42.92	44.49	45.66	45.25
Greece	34.64	32.41	35.55	36.81	38.52	38.57	41.22	34.14	30.76	31.11	31.93	29.54	33.66	33.30	35.23	33.18
Hungary	12.80	13.04	13.25	13.09	13.66	18.41	17.94	20.22	22.01	23.12	24.34	25.81	25.79	27.88	26.85	31.19
Ireland	48.05	48.30	50.21	50.91	48.62	49.57	49.25	45.58	44.37	43.71	47.82	50.73	51.69	52.28	56.02	51.96
Italy	34.22	34.15	36.30	37.04	35.90	33.61	33.71	33.93	32.88	34.99	38.70	40.42	41.74	42.23	45.00	43.24
Luxembourg	24.26	26.05	28.19	28.91	45.80	45.91	43.38	45.16	45.50	51.11	49.37	37.17	52.15	47.90	51.80	50.32
Netherlands	40.87	41.24	43.94	44.14	42.79	45.93	45.46	45.52	46.71	47.17	51.45	51.46	55.38	55.67	57.91	55.40
Norway	41.09	43.23	46.37	49.37	49.14	46.82	46.39	51.12	50.63	50.53	51.36	48.38	49.81	53.52	55.90	53.02
Poland	14.98	16.81	17.64	20.66	22.77	23.08	24.29	23.47	23.53	25.25	27.39	27.73	31.74	30.54	29.05	25.80
Slovakia	14.61	15.02	17.97	19.86	19.30	19.05	20.09	20.82	20.11	20.45	22.67	23.65	25.79	25.03	27.73	24.12
Sweden	43.87	47.75	48.31	50.53	49.81	44.91	45.46	46.63	47.66	48.16	49.98	49.35	49.75	53.00	51.12	51.18
UK	45.76	46.71	48.18	49.15	48.40	39.03	39.14	40.10	40.87	42.26	44.34	46.53	45.63	47.75	49.78	42.65
Estonia	18.29	20.78	21.46	22.28	20.73	18.38	18.77	20.96	21.51	21.00	20.98	23.23	22.46	24.50	25.42	30.42
Slovenia	23.89	23.14	26.14	26.41	25.75	26.18	27.20	27.53	32.55	30.18	26.99	30.70	31.82	35.22	33.41	35.90
Latvia	15.64	19.04	19.37	20.15	18.70	18.08	18.97	21.79	23.79	20.36	20.88	24.55	23.21	26.16	26.45	26.10
Lithuania	13.50	14.47	16.80	17.60	15.32	20.31	21.05	18.79	24.87	25.61	26.61	26.46	29.01	31.92	28.35	27.09
Bulgaria	12.08	12.12	13.34	14.73	13.40	16.48	17.13	18.99	19.13	19.83	19.87	20.10	21.50	21.38	23.23	21.30
Croatia	19.54	18.46	19.60	20.29	17.03	20.37	20.03	18.37	19.08	18.35	21.50	18.91	18.79	22.09	21.94	20.95
Romania	6.40	7.70	9.89	11.50	11.00	19.26	21.20	22.67	20.52	21.03	20.89	21.87	25.67	26.60	26.99	26.77

Source: Authors.

Table A3.4. Individual Dimension. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	50.96	50.94	52.43	52.61	51.97	53.38	55.43	55.66	56.18	56.71	57.72	58.65	60.11	59.27	62.57	60.36
Portugal	42.25	43.02	41.54	45.89	46.04	46.33	48.31	50.48	50.07	47.69	48.20	50.34	50.97	52.51	53.51	52.42
France	60.76	60.89	59.99	60.91	61.05	62.00	62.91	63.50	65.68	66.93	66.27	66.13	66.49	67.83	68.51	66.80
Austria	59.92	60.98	60.95	58.47	59.85	59.08	59.35	63.23	62.28	62.65	63.66	63.65	63.38	63.48	64.66	64.74
Belgium	61.01	59.84	61.61	61.48	61.88	62.39	62.46	63.92	64.75	65.67	66.09	66.02	67.76	68.26	67.25	67.51
Czech Rep.	53.57	53.31	56.78	56.56	57.36	58.24	57.84	58.76	58.86	59.75	59.64	60.56	60.36	61.04	62.08	60.96
Denmark	70.60	69.79	71.70	70.83	69.71	71.41	71.14	71.13	71.30	72.08	71.65	71.90	71.09	70.82	70.17	69.91
Finland	62.17	63.30	65.43	64.87	65.86	66.69	67.15	67.47	67.00	68.63	70.20	70.26	70.98	71.49	71.41	71.58
Germany	54.16	55.64	56.64	56.25	57.14	57.41	57.85	57.57	57.86	56.94	62.61	62.71	63.46	63.81	64.07	64.36
Greece	46.75	46.77	46.03	43.68	45.28	46.65	45.82	45.33	45.41	44.34	45.97	47.97	48.64	48.37	49.98	50.36
Hungary	40.48	41.73	43.76	45.94	45.65	46.21	46.83	46.47	48.26	47.92	48.41	51.03	50.73	53.59	54.90	54.38
Ireland	60.34	59.80	60.66	61.08	62.64	63.02	62.86	63.31	63.07	63.92	65.43	66.60	68.44	70.16	70.65	70.55
Italy	54.81	53.62	54.44	53.87	54.48	57.17	54.05	55.38	55.88	56.94	56.65	61.35	62.37	62.61	63.49	62.41
Luxembourg	67.00	66.38	68.02	70.27	71.18	70.37	70.86	72.04	70.30	71.24	69.95	66.77	66.89	68.85	70.54	72.28
Netherlands	64.45	65.35	65.09	66.00	66.69	67.38	67.53	68.42	67.80	69.03	68.87	68.74	69.40	69.00	69.11	69.78
Norway	71.03	70.33	73.98	76.15	75.34	77.48	76.62	80.63	79.24	80.09	80.72	80.13	80.82	80.31	79.06	77.70
Poland	44.51	43.01	45.82	46.67	46.41	46.14	46.32	46.60	47.90	48.03	49.45	51.58	50.44	51.27	52.94	51.18
Slovakia	46.63	44.53	46.81	45.84	47.64	46.96	46.66	47.50	48.67	49.95	50.60	51.58	50.44	51.86	52.06	52.88
Sweden	66.21	71.35	71.28	69.72	70.79	72.65	71.52	73.27	73.52	76.86	76.29	75.70	76.55	77.28	77.70	76.57
UK	62.32	62.09	64.39	64.92	64.59	65.36	63.88	67.40	67.39	65.31	66.70	66.67	67.58	65.78	66.92	65.54
Estonia	51.67	50.11	49.98	52.25	53.59	53.83	55.39	53.76	53.46	52.66	54.69	58.04	56.20	57.04	59.36	59.76
Slovenia	52.64	51.94	52.96	53.61	55.24	52.89	51.88	54.20	55.17	55.68	56.10	57.12	56.93	58.27	60.80	62.73
Latvia	38.77	37.51	38.41	39.67	42.32	43.21	44.56	45.64	42.95	42.63	44.23	45.42	43.42	44.36	46.12	47.38
Lithuania	40.21	40.38	42.15	45.83	45.63	46.51	46.27	45.23	45.92	45.69	44.48	44.85	45.23	46.93	48.20	49.09
Bulgaria	31.31	31.50	31.81	32.04	33.78	35.67	36.88	36.85	36.91	39.43	40.64	43.30	41.29	45.09	46.15	45.85
Croatia	47.11	46.41	45.49	45.06	44.40	44.44	47.18	48.36	45.60	46.42	43.63	45.65	44.90	46.48	46.70	47.77
Romania	33.60	34.21	28.85	33.55	36.23	36.19	38.12	36.59	37.39	34.91	35.74	37.84	37.39	39.75	40.80	42.30

Source: Authors.

Table A3.5. Category: Health and social protection. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	27.79	28.53	29.21	30.87	34.64	34.19	34.94	35.17	35.12	35.78	35.45	34.92	35.68	36.39	37.38	47.15
Portugal	39.35	41.47	41.49	44.07	46.42	44.30	44.11	45.23	42.91	43.13	43.21	44.06	44.18	44.99	45.97	50.33
France	43.75	45.31	45.52	46.90	51.74	50.74	50.76	51.24	52.73	53.61	52.90	48.02	47.62	46.83	46.13	52.77
Austria	40.79	40.24	40.74	41.25	43.99	44.74	43.96	44.77	45.97	46.63	47.14	47.10	47.47	46.99	47.48	55.36
Belgium	37.58	37.52	37.99	39.06	43.32	42.80	43.69	44.44	45.61	46.07	46.63	46.06	46.38	47.26	48.30	50.32
Czech Rep.	13.52	13.87	14.01	17.55	20.54	22.35	22.62	23.08	22.90	24.57	22.44	23.22	23.53	23.68	24.17	32.76
Denmark	47.79	48.09	49.02	49.48	55.23	54.16	52.67	52.47	52.41	51.93	52.24	52.08	51.64	51.74	52.11	56.61
Finland	42.72	42.29	42.12	43.61	47.66	47.65	48.07	50.24	51.60	51.55	53.44	52.89	51.67	51.80	52.68	58.99
Germany	50.05	49.88	50.06	51.65	51.49	50.75	49.62	50.63	51.14	51.64	52.97	53.72	54.55	55.85	57.69	61.49
Greece	32.43	30.40	30.89	31.95	33.88	34.86	34.15	32.31	31.67	31.68	32.22	33.22	31.91	32.72	32.17	40.93
Hungary	34.97	33.39	30.37	29.38	30.61	31.78	31.53	30.33	28.98	27.92	26.53	28.56	26.53	25.70	24.78	30.86
Ireland	33.27	32.71	33.58	38.35	46.41	48.99	52.23	51.90	50.96	46.41	34.34	34.64	32.88	31.04	30.30	31.83
Italy	29.27	29.95	28.68	30.79	32.72	32.57	32.56	36.73	36.90	37.96	38.37	37.97	38.64	39.49	39.64	46.15
Luxembourg	27.31	25.17	23.55	22.64	27.87	27.15	26.09	22.79	23.55	23.79	23.51	23.58	24.32	25.17	26.53	32.17
Netherlands	57.27	48.12	48.60	50.63	55.23	56.67	57.11	58.80	58.86	58.26	55.54	55.38	53.96	53.46	54.47	63.18
Norway	46.68	45.40	46.45	46.28	52.36	51.75	52.02	52.20	53.12	54.82	58.81	61.03	58.45	57.08	59.64	63.24
Poland	17.20	17.37	17.37	19.53	20.76	19.96	19.20	19.31	21.54	20.88	21.18	23.26	22.63	20.13	20.44	20.31
Slovakia	19.30	27.05	30.53	27.10	33.56	33.71	24.56	29.57	23.85	18.01	18.22	17.21	16.25	15.25	16.76	18.00
Sweden	43.44	42.21	42.74	43.95	47.01	44.01	51.69	53.15	54.87	55.01	55.61	56.39	55.71	56.84	53.67	56.24
UK	49.20	44.42	45.09	44.59	54.12	53.62	55.32	55.60	51.99	52.27	52.10	51.26	50.70	52.21	52.76	67.35
Estonia	13.99	12.44	13.25	17.83	21.59	21.92	18.84	19.50	20.27	21.14	23.11	23.53	23.84	24.99	25.45	30.91
Slovenia	30.92	30.36	29.59	30.52	34.55	34.73	35.24	33.86	36.44	34.47	33.93	33.87	32.90	33.58	35.14	40.27
Latvia	18.47	20.74	17.36	18.31	23.69	23.05	20.60	19.45	16.07	18.40	20.13	24.93	23.51	24.41	27.03	30.63
Lithuania	18.64	19.06	18.14	18.85	23.36	20.69	20.16	20.29	20.28	21.11	23.68	25.27	24.93	25.38	29.74	33.08
Bulgaria	27.53	27.64	26.12	27.43	28.82	33.13	32.86	34.81	30.28	32.54	31.75	32.44	32.17	30.07	28.21	35.05
Croatia	16.21	15.47	16.42	19.37	20.23	20.08	19.29	19.38	14.04	16.01	16.76	17.25	16.90	17.59	17.55	21.31
Romania	17.77	13.28	14.26	13.38	19.19	17.83	5.95	5.49	8.54	8.11	8.49	8.39	8.94	9.56	10.37	13.50

Source: Authors.

Table A3.6. Category: Pensions and labour protection. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	30.06	29.12	29.97	28.88	30.30	32.65	33.73	35.92	37.77	38.90	40.78	41.01	42.07	42.53	42.71	44.10
Portugal	41.55	42.26	40.94	42.54	44.20	44.32	45.15	46.18	48.29	49.31	49.86	51.08	51.87	50.55	51.24	51.36
France	42.17	42.25	43.43	45.20	45.79	47.64	47.52	48.24	49.22	49.80	50.56	50.97	51.43	52.37	50.74	51.60
Austria	45.45	44.12	44.28	43.44	43.96	46.09	46.57	47.93	48.31	48.90	49.00	48.83	49.75	49.91	49.16	48.52
Belgium	35.87	34.61	35.29	36.63	36.93	39.97	39.41	40.24	41.28	42.03	43.47	44.65	45.44	46.17	45.06	45.64
Czech Rep.	32.28	32.03	32.24	31.93	32.67	34.03	34.54	34.66	34.92	34.55	34.34	34.42	34.12	33.02	32.23	32.93
Denmark	47.23	45.62	49.37	52.00	54.39	57.07	58.96	59.64	60.35	63.17	63.51	62.64	63.65	63.63	64.01	65.42
Finland	42.93	41.74	42.40	43.32	45.55	47.68	45.12	46.04	46.95	47.56	49.04	50.77	51.77	52.03	50.44	50.99
Germany	40.23	39.66	39.49	39.77	40.77	41.63	42.90	42.10	42.10	41.52	42.56	42.50	42.96	43.14	42.22	42.72
Greece	32.84	32.55	32.66	34.18	35.25	35.39	36.32	39.11	40.82	41.37	43.04	43.21	42.24	42.69	44.44	45.31
Hungary	34.39	34.20	36.00	36.89	36.90	36.97	37.30	32.40	34.17	34.71	35.89	36.24	35.20	34.19	33.34	30.33
Ireland	29.66	27.61	30.16	31.84	32.07	34.24	34.45	35.97	36.38	37.67	37.25	36.27	36.28	35.57	37.43	37.24
Italy	43.28	44.92	43.72	43.74	44.28	45.18	45.61	45.83	46.63	46.74	48.08	48.26	49.30	50.29	49.10	50.22
Luxembourg	46.17	45.48	45.42	46.11	47.63	49.41	52.09	52.62	54.61	57.86	57.28	57.56	56.32	59.69	60.22	64.92
Netherlands	37.40	36.88	37.52	38.69	40.23	41.06	41.65	42.65	42.53	43.22	44.52	43.11	43.75	44.84	42.04	43.19
Norway	36.26	35.53	37.48	38.06	38.34	38.41	40.20	42.21	43.04	45.35	46.74	47.51	48.11	49.71	50.43	49.55
Poland	37.81	38.88	38.95	37.60	37.84	38.17	37.43	38.86	39.83	39.85	40.57	40.71	40.69	40.64	40.26	40.45
Slovakia	28.93	29.38	29.78	29.97	30.17	32.95	33.19	31.91	33.68	34.15	34.89	34.99	35.16	35.09	33.20	40.33
Sweden	45.18	48.07	49.81	49.15	48.56	48.46	48.39	48.91	49.67	50.81	50.79	51.00	51.52	51.35	51.33	52.94
UK	38.26	39.35	38.52	37.73	40.17	42.49	42.31	44.72	45.75	44.67	45.26	46.23	47.16	46.75	46.25	47.29
Estonia	31.75	30.21	28.93	29.48	34.68	39.17	39.78	38.45	37.98	35.89	35.03	35.45	35.73	33.53	34.94	36.49
Slovenia	37.37	36.04	36.93	37.20	37.79	39.22	40.59	40.81	40.05	41.44	41.72	41.71	41.74	42.19	39.71	41.00
Latvia	35.35	28.48	25.67	21.02	22.48	34.09	37.77	36.59	35.88	33.12	31.31	30.72	31.62	30.99	29.33	32.33
Lithuania	34.49	31.32	28.45	30.21	32.32	38.42	38.66	36.66	36.88	36.63	36.14	35.89	34.88	35.10	36.38	33.45
Bulgaria	28.75	29.77	30.27	29.51	27.43	30.27	29.99	30.65	30.65	32.75	31.21	34.14	31.73	33.82	32.62	30.45
Croatia	36.98	35.37	36.01	32.44	31.07	32.78	33.91	33.51	35.21	36.73	36.38	36.74	38.24	37.16	37.74	39.40
Romania	34.62	33.99	31.74	35.02	37.46	40.33	40.70	42.40	41.79	40.80	38.03	39.63	38.79	37.12	34.35	35.40

Source: Authors.

Table A3.7. Category: Senior Goods and Services Market. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	32.39	35.07	36.79	37.71	34.95	43.24	43.03	42.72	42.67	44.07	45.05	46.20	48.89	49.71	50.98	41.17
Portugal	22.37	23.78	24.55	25.48	23.90	26.34	25.52	24.61	25.09	25.52	32.44	33.39	34.04	36.01	37.84	34.08
France	35.20	36.64	38.60	39.51	38.68	38.31	39.44	39.66	40.71	40.85	42.57	43.34	44.17	45.09	46.60	41.46
Austria	37.98	39.91	41.39	42.46	42.31	44.66	46.55	47.70	48.47	49.20	49.75	50.86	52.27	53.79	54.51	50.48
Belgium	38.62	40.30	42.23	44.17	43.66	43.46	45.28	46.89	48.14	49.11	51.55	52.20	53.90	56.00	57.74	44.53
Czech Rep.	10.71	11.26	12.53	13.73	13.83	14.18	14.60	14.72	15.30	15.97	16.90	17.49	18.73	19.55	20.47	18.62
Denmark	29.22	31.49	33.58	34.85	33.44	39.31	39.91	40.90	41.50	41.75	43.24	43.42	46.14	48.77	49.20	46.47
Finland	27.74	29.94	32.93	35.16	34.01	33.99	36.08	36.72	37.16	37.82	41.05	42.17	43.42	44.68	45.34	43.54
Germany	41.23	42.62	43.72	44.97	44.43	43.02	45.33	46.79	47.11	48.17	46.58	48.13	49.91	51.91	52.89	48.99
Greece	34.31	36.31	38.26	41.82	40.12	38.24	35.71	33.57	33.06	33.62	30.44	30.04	31.39	32.10	32.74	28.31
Hungary	8.45	8.77	9.07	9.57	9.04	15.67	16.71	16.80	17.06	17.30	19.63	20.47	21.23	22.48	23.93	29.18
Ireland	36.25	39.73	43.84	43.70	39.33	43.10	42.55	42.54	42.51	42.74	45.25	47.49	48.52	50.41	52.05	43.75
Italy	37.63	39.51	41.19	43.10	41.66	38.71	39.33	38.33	37.53	37.09	44.26	45.92	47.55	48.72	50.01	40.44
Luxembourg	73.94	79.82	81.50	85.94	83.80	71.21	74.20	77.40	78.73	80.42	87.90	89.81	93.92	100.00	99.87	83.22
Netherlands	36.64	38.03	40.32	41.42	38.63	43.63	44.10	43.97	44.23	44.00	50.62	50.71	53.21	55.96	56.62	49.86
Norway	39.69	43.11	47.74	48.99	48.68	48.07	48.93	51.25	53.17	54.56	55.80	55.88	59.93	61.83	62.59	57.79
Poland	10.67	11.68	13.45	15.30	15.81	16.11	17.60	18.64	18.74	19.18	21.84	22.25	23.70	24.88	26.16	19.37
Slovakia	10.35	11.59	13.28	15.60	15.57	15.47	15.67	16.28	16.68	17.09	21.10	19.56	19.65	20.58	21.45	16.95
Sweden	36.88	39.27	42.72	44.26	43.84	36.31	37.70	38.56	38.51	39.48	41.81	41.71	42.66	43.98	44.58	43.18
UK	39.28	41.40	43.00	43.57	40.19	27.09	27.79	28.50	29.35	30.26	32.65	34.13	35.42	36.60	37.55	31.82
Estonia	9.53	11.18	12.89	12.86	10.55	8.30	9.11	10.00	10.71	11.19	11.16	11.73	12.38	13.33	14.13	17.71
Slovenia	25.01	25.68	28.06	30.22	29.29	30.38	31.66	31.71	31.07	31.18	31.32	32.37	33.79	35.64	38.40	30.09
Latvia	7.18	9.16	10.88	10.29	7.88	11.02	11.36	12.66	14.06	14.08	13.24	13.73	14.71	15.40	15.73	15.52
Lithuania	6.97	7.86	9.52	10.58	8.52	14.93	16.28	17.50	18.89	19.77	17.70	18.47	19.76	20.74	21.79	18.97
Bulgaria	5.22	5.55	7.07	7.40	6.49	10.46	11.59	12.71	12.13	13.05	13.62	14.33	15.09	16.01	16.94	15.11
Croatia	18.18	19.37	21.31	22.88	20.57	21.12	22.09	23.02	23.22	23.18	24.65	24.59	25.37	26.35	27.69	27.10
Romania	1.00	1.56	2.46	3.40	2.87	9.37	10.37	10.99	10.37	10.90	11.79	13.17	15.02	16.84	18.35	15.55

Source: Authors.

Table A3.8. Category: Senior Labour Market. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	26.09	28.24	29.11	28.71	30.53	29.55	32.19	31.38	29.27	28.04	30.68	30.63	31.29	32.72	35.02	39.09
Portugal	47.24	48.13	50.62	50.02	54.46	56.11	60.59	57.04	55.60	47.86	48.07	47.62	49.05	48.47	49.21	50.08
France	35.49	38.52	35.42	37.59	39.21	38.51	38.51	38.02	33.75	34.60	38.48	38.71	38.35	39.36	37.48	41.95
Austria	32.21	37.95	40.09	40.42	41.33	39.86	41.10	39.24	42.26	38.51	42.47	43.32	41.71	47.48	48.65	51.11
Belgium	33.29	29.83	28.54	26.74	34.03	36.00	37.30	36.00	35.48	33.90	34.86	33.41	33.18	38.82	35.53	35.09
Czech Rep.	35.97	39.32	36.21	39.88	35.51	34.20	30.76	41.35	36.86	40.16	37.58	38.94	42.12	45.93	46.20	47.33
Denmark	47.26	48.12	53.80	50.43	51.80	51.95	49.38	52.29	57.97	55.31	49.20	52.71	53.16	55.59	55.71	54.55
Finland	44.60	45.48	45.83	47.41	47.58	50.31	48.57	47.92	48.86	45.74	50.91	48.92	50.08	56.10	55.97	54.22
Germany	27.45	27.42	30.59	28.95	30.48	29.94	30.41	31.20	32.53	33.39	33.97	35.19	36.91	38.13	39.41	41.80
Greece	34.97	28.93	33.03	32.40	36.98	38.89	47.58	34.72	28.62	28.79	33.50	29.04	36.09	34.55	37.91	38.89
Hungary	19.41	19.39	19.34	17.89	20.65	21.61	19.27	24.33	28.40	30.89	30.17	32.56	31.32	34.57	30.12	33.35
Ireland	63.69	58.72	57.50	59.31	60.11	57.01	57.01	48.83	46.32	44.70	50.54	54.19	55.08	54.22	60.29	61.73
Italy	31.12	29.53	32.00	31.82	30.94	29.18	28.90	30.04	28.80	33.01	33.84	35.58	36.64	36.61	40.50	46.23
Luxembourg	7.96	8.50	9.75	9.73	25.03	29.60	25.37	26.35	26.29	32.48	27.72	15.39	28.95	22.94	26.87	30.43
Netherlands	45.59	44.73	47.88	47.04	47.39	48.35	46.86	47.13	49.33	50.58	52.30	52.23	57.63	55.39	59.23	61.56
Norway	42.54	43.35	45.03	49.75	49.60	45.61	43.98	50.99	48.22	46.81	47.28	41.89	41.40	46.33	49.92	48.64
Poland	21.03	24.21	23.13	27.89	32.80	33.08	33.51	29.55	29.55	33.24	34.36	34.56	42.50	37.48	32.25	34.37
Slovakia	20.64	19.47	24.31	25.28	23.93	23.45	25.76	26.63	24.24	24.47	24.36	28.60	33.85	30.44	35.85	34.34
Sweden	52.19	58.07	54.62	57.69	56.60	55.55	54.80	56.39	58.99	58.76	59.74	58.39	58.01	63.87	58.62	60.67
UK	53.31	52.71	53.99	55.45	58.29	56.24	55.14	56.43	56.91	59.02	60.23	63.44	58.79	62.29	66.00	57.18
Estonia	35.12	38.63	35.73	38.60	40.72	40.72	38.68	43.93	43.19	39.39	39.47	46.00	40.75	45.06	45.73	52.25
Slovenia	22.83	20.86	24.35	23.08	22.65	22.56	23.37	23.89	34.10	29.21	23.25	29.11	29.96	34.81	29.07	42.83
Latvia	34.07	39.60	34.47	39.43	44.38	29.65	31.67	37.51	40.26	29.44	32.91	43.90	36.62	44.43	44.49	43.87
Lithuania	26.14	26.63	29.65	29.27	27.53	27.62	27.23	20.18	32.75	33.19	40.01	37.91	42.60	49.13	36.88	38.68
Bulgaria	27.95	26.48	25.18	29.29	27.67	25.94	25.29	28.38	30.16	30.11	28.99	28.20	30.63	28.55	31.85	30.02
Croatia	20.99	17.60	18.03	17.98	14.11	19.65	18.17	14.66	15.67	14.52	18.75	14.54	13.92	18.52	17.38	16.19
Romania	40.91	38.02	39.80	38.95	42.16	39.56	43.34	46.78	40.60	40.59	37.01	36.30	43.87	42.03	39.70	46.10

Source: Authors.

Table A3.9. Category: Social Participation. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	41.36	42.20	43.01	42.70	42.83	44.33	44.22	46.24	45.96	45.88	50.06	48.49	48.49	49.18	52.32	53.60
Portugal	42.41	41.10	40.74	42.61	41.74	42.34	44.57	42.66	43.84	43.78	46.05	46.97	47.60	49.77	50.95	49.77
France	58.67	60.01	57.82	58.49	60.24	59.72	60.34	60.59	66.04	65.99	66.70	66.49	68.45	68.11	68.77	65.18
Austria	56.95	58.99	59.19	59.28	60.15	60.24	60.32	61.57	62.08	62.67	65.22	65.45	64.74	68.08	67.21	66.23
Belgium	59.25	60.68	60.91	61.31	61.27	62.14	62.34	62.42	63.63	64.36	64.05	63.50	66.15	66.98	65.66	65.70
Czech Rep.	61.82	59.32	60.77	61.73	61.76	62.41	63.37	65.29	65.44	65.87	66.26	67.45	67.68	68.35	68.82	68.10
Denmark	79.67	81.54	81.23	82.24	84.82	84.95	84.70	84.86	84.93	83.88	84.24	83.84	83.91	82.14	82.15	81.32
Finland	71.16	72.31	73.69	74.41	74.55	75.63	76.80	76.92	77.86	78.93	79.69	79.84	79.79	80.75	81.30	80.21
Germany	60.67	61.39	61.07	59.69	60.72	62.66	63.13	62.55	62.92	60.56	62.49	64.60	66.07	65.75	65.67	66.51
Greece	40.21	35.89	34.56	34.63	35.76	36.12	34.71	34.85	39.34	38.81	39.36	41.10	41.07	40.65	41.64	44.23
Hungary	47.82	43.54	45.92	47.27	46.36	47.99	50.13	48.66	50.48	48.12	49.70	51.53	50.91	53.67	54.43	51.19
Ireland	51.60	51.81	53.40	54.54	56.77	55.29	55.38	55.15	54.96	55.97	56.62	58.44	61.09	63.88	64.90	66.26
Italy	49.06	46.99	48.12	46.77	46.98	47.72	48.62	49.18	49.19	48.50	49.96	50.58	53.02	52.97	53.14	52.83
Luxembourg	61.38	61.91	64.26	64.68	65.84	65.32	65.75	67.14	67.43	69.43	70.76	66.43	66.61	67.53	69.60	72.19
Netherlands	69.92	70.03	71.32	71.90	73.10	73.35	73.27	74.38	74.57	73.99	75.24	75.55	76.48	76.59	77.11	77.27
Norway	74.58	76.06	76.71	78.15	78.19	80.37	79.52	81.63	82.59	82.40	82.48	82.51	82.36	83.48	82.74	79.90
Poland	47.11	48.15	49.20	48.77	49.46	48.83	47.56	45.85	45.38	44.98	46.26	48.97	48.08	49.19	50.20	53.12
Slovakia	56.45	54.67	53.13	53.50	53.36	54.10	53.15	53.10	53.30	53.03	53.90	54.12	54.10	53.91	54.24	55.39
Sweden	75.80	77.15	75.56	77.44	77.01	78.20	78.90	80.37	81.46	82.79	81.62	81.40	81.89	82.89	84.82	82.14
UK	63.87	63.35	66.02	67.31	67.93	68.74	66.58	67.95	67.02	66.12	68.18	67.82	70.11	69.44	69.99	69.85
Estonia	57.81	57.40	54.86	55.94	57.17	58.55	61.30	61.01	60.19	58.41	61.47	64.81	62.55	65.63	66.93	66.41
Slovenia	51.13	50.02	51.29	51.59	51.20	55.98	55.10	55.91	56.97	54.31	56.64	57.99	58.53	60.44	61.36	61.60
Latvia	41.10	41.43	39.21	39.09	43.10	41.69	44.48	45.52	44.36	43.47	47.08	47.70	44.68	46.40	48.90	50.21
Lithuania	41.88	41.87	41.65	41.51	42.21	44.69	47.54	48.24	47.43	46.10	48.48	47.28	45.40	46.90	49.97	51.85
Bulgaria	27.64	28.08	28.02	28.10	28.93	27.79	27.84	28.66	27.90	27.04	33.54	38.32	38.07	40.28	41.51	42.53
Croatia	46.20	43.91	44.03	43.35	44.17	43.27	44.46	44.71	45.02	46.39	45.68	47.36	46.20	48.03	49.61	49.14
Romania	19.83	21.93	18.77	20.69	20.75	22.72	22.42	21.60	22.13	17.09	17.95	22.52	23.39	25.43	26.19	28.81

Source: Authors.

Table A3.10. Category: Financial Security. Data by country and year																
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	66.94	63.87	65.25	69.82	69.02	68.77	70.92	72.24	75.64	74.84	75.50	75.19	74.14	74.07	76.81	74.49
Portugal	54.73	55.56	56.35	60.96	64.45	63.39	65.64	67.64	66.12	65.54	66.73	68.15	68.59	70.77	72.66	73.20
France	74.81	73.91	74.09	76.70	77.18	79.79	80.82	81.48	81.62	82.62	82.34	82.87	82.68	83.61	82.79	82.16
Austria	77.32	77.02	74.49	71.27	72.54	74.05	72.36	77.97	75.94	78.41	79.04	79.72	80.90	77.44	79.27	79.84
Belgium	67.51	61.01	63.30	63.18	66.00	67.05	67.51	67.80	69.72	69.98	71.37	72.73	73.85	74.70	74.14	75.06
Czech Rep.	62.04	62.24	62.77	61.71	63.62	65.13	64.45	63.91	65.00	66.69	67.86	69.18	70.39	71.48	72.50	74.56
Denmark	62.35	62.15	64.62	64.20	61.91	62.01	62.95	66.47	66.15	70.07	69.87	70.08	69.07	69.43	69.01	70.35
Finland	74.04	74.29	74.81	73.75	76.02	78.24	78.67	78.51	79.66	80.28	81.39	81.47	83.02	84.20	83.37	83.90
Germany	70.49	66.44	66.53	67.90	70.15	67.73	69.42	68.09	67.82	68.26	69.40	67.77	68.77	69.94	69.18	74.28
Greece	44.05	48.97	48.78	48.15	52.63	55.00	50.80	52.19	48.56	41.98	44.27	48.81	50.01	51.36	52.79	55.68
Hungary	59.02	60.49	61.00	61.22	62.44	62.69	60.80	56.83	61.47	63.72	65.15	69.48	69.02	73.64	77.07	76.78
Ireland	68.03	67.72	67.45	66.98	67.45	70.28	68.40	69.00	69.67	69.45	72.41	71.74	73.96	75.11	75.94	77.50
Italy	67.24	68.60	70.60	71.41	71.35	73.76	70.53	71.23	71.67	74.50	74.19	73.50	75.21	76.46	77.40	79.57
Luxembourg	82.86	82.89	82.67	85.04	84.06	82.60	83.35	84.66	85.17	84.99	82.10	81.91	80.89	84.75	82.70	83.11
Netherlands	65.91	69.04	64.71	68.75	71.05	72.51	73.43	74.36	74.11	74.76	75.24	72.86	74.40	73.62	72.84	75.35
Norway	77.39	75.44	80.15	79.54	80.59	81.59	81.05	84.08	83.86	85.23	86.35	85.08	86.37	85.56	83.33	85.57
Poland	45.89	50.50	53.23	51.90	51.89	52.78	52.72	54.06	57.36	59.36	61.91	63.54	63.11	64.14	65.29	65.39
Slovakia	51.33	50.49	54.38	57.75	60.51	61.54	63.32	60.09	63.21	64.54	65.16	64.40	62.66	67.58	67.70	70.43
Sweden	71.69	74.13	75.67	71.69	72.10	74.61	73.01	74.77	74.66	76.72	76.25	76.06	76.44	77.26	76.40	76.83
UK	66.57	66.78	68.45	67.33	66.06	66.51	66.01	77.52	77.11	74.73	75.65	75.76	74.77	71.38	73.07	69.49
Estonia	64.61	65.55	65.77	68.33	68.86	69.70	70.04	66.33	66.59	64.76	67.89	68.14	67.83	67.37	67.59	70.01
Slovenia	67.10	64.07	64.82	66.10	66.93	66.57	65.75	67.00	65.45	66.57	68.64	69.51	71.44	71.75	72.71	74.52
Latvia	43.44	43.60	45.59	45.11	46.27	51.25	52.32	52.52	50.59	53.97	54.81	55.94	55.97	56.49	58.83	62.91
Lithuania	46.44	48.28	53.47	56.88	56.36	56.91	52.09	49.51	53.66	54.78	51.32	52.70	55.74	56.80	58.86	61.10
Bulgaria	29.22	26.28	24.29	26.41	28.88	31.70	37.14	33.78	34.02	43.33	37.93	39.74	37.20	42.50	42.57	44.01
Croatia	57.56	60.03	58.65	60.76	58.32	52.77	57.76	59.28	59.01	57.80	55.43	59.84	59.62	61.34	61.61	62.24
Romania	47.92	45.71	29.57	35.75	45.37	45.86	55.40	49.22	48.80	49.95	50.98	48.96	48.60	50.84	51.66	55.76

Source: Authors.

Table A3.11. Healthy and Active Ageing Category. Data by country and year

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Spain	47.80	49.05	51.36	48.85	47.49	49.89	54.29	51.63	51.01	53.12	50.87	55.34	60.42	57.15	60.96	55.06
Portugal	32.50	34.87	31.24	37.20	36.28	37.06	38.54	44.58	43.29	37.82	36.45	39.85	40.55	41.11	41.39	39.53
France	51.11	50.91	50.39	50.36	48.93	50.01	51.05	51.86	52.56	55.00	53.00	52.48	51.93	54.80	56.48	55.66
Austria	48.86	49.91	51.36	47.32	49.14	46.22	47.89	52.67	51.23	50.03	50.04	49.41	48.61	48.52	50.74	51.31
Belgium	56.78	57.89	60.67	59.98	58.59	58.29	57.90	61.71	61.20	62.87	63.13	62.32	63.68	63.58	62.48	62.37
Czech Rep.	40.08	41.04	47.99	47.50	48.04	48.61	47.36	48.62	47.94	48.56	47.17	47.59	46.16	46.54	47.96	44.61
Denmark	70.83	67.08	70.22	67.29	64.52	69.14	67.54	63.79	64.52	63.73	62.49	63.26	61.98	62.28	60.96	59.74
Finland	45.62	47.21	50.81	49.75	50.42	50.13	50.11	50.85	48.49	51.01	53.34	53.33	53.98	53.74	53.72	54.49
Germany	37.15	42.23	44.73	43.92	43.80	44.58	44.19	44.81	45.40	44.66	56.58	56.32	56.24	56.51	57.89	53.97
Greece	57.70	58.24	57.84	49.96	49.34	51.09	54.57	51.21	49.03	53.51	55.74	55.05	56.03	54.21	56.77	51.86
Hungary	23.50	27.58	29.90	33.51	32.87	32.81	33.71	36.29	36.22	35.88	35.04	37.13	37.15	38.95	39.45	40.93
Ireland	62.58	60.97	61.97	62.37	64.19	64.43	65.59	66.68	65.52	67.18	68.34	70.46	70.95	71.97	71.55	68.39
Italy	49.91	47.81	47.48	46.80	48.23	53.09	46.04	48.49	49.50	51.07	49.06	62.13	60.84	60.60	62.21	57.82
Luxembourg	59.14	57.00	59.25	63.07	65.17	64.58	64.92	65.77	60.50	61.26	58.91	54.70	55.56	57.03	61.00	62.93
Netherlands	58.10	57.73	59.75	58.15	57.11	57.51	57.25	57.90	56.41	59.46	57.71	59.00	58.75	58.26	58.77	58.36
Norway	62.09	60.63	65.85	71.05	67.86	70.94	69.79	76.36	71.85	73.16	73.84	73.29	74.21	72.53	71.67	68.62
Poland	40.79	32.72	36.73	40.16	38.94	38.11	39.64	40.82	42.24	41.50	42.22	44.10	42.30	42.71	45.26	38.60
Slovakia	34.99	31.98	35.50	31.17	33.49	31.12	30.19	33.58	34.23	36.42	36.88	39.37	37.86	38.29	38.43	37.91
Sweden	53.42	63.51	63.34	61.03	63.90	65.71	63.50	65.46	65.34	71.49	71.33	70.06	71.67	72.07	72.39	71.15
UK	56.93	56.57	59.09	60.38	60.05	61.08	59.31	58.14	59.21	56.39	57.54	57.68	58.89	57.43	58.61	58.01
Estonia	36.94	33.44	34.60	37.31	39.10	38.23	39.58	38.40	38.12	38.61	39.21	44.28	41.84	41.98	46.23	45.90
Slovenia	42.52	43.73	44.68	45.19	49.19	39.69	38.54	42.49	45.05	47.74	45.42	46.24	44.14	45.61	50.37	53.77
Latvia	32.64	29.21	31.70	35.39	38.00	37.77	38.01	39.76	35.29	33.02	33.53	35.11	32.73	33.31	34.11	33.68
Lithuania	33.43	32.56	33.63	40.77	39.95	39.57	40.00	38.75	38.04	37.76	35.38	36.21	36.57	38.80	38.07	37.35
Bulgaria	37.99	42.37	47.31	44.33	46.12	51.50	48.53	51.69	52.99	52.31	52.78	53.29	49.72	53.55	55.61	51.51
Croatia	39.31	37.93	36.45	34.74	33.97	38.42	40.90	42.68	35.68	37.30	32.80	33.57	32.87	34.07	33.33	35.64
Romania	39.92	39.95	43.25	51.06	50.52	45.51	44.61	46.07	48.39	49.84	49.89	49.12	45.97	48.59	50.21	47.13

Source: Authors.

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