Deutsche
Rentenversicherung
Bund

DRV Discussion Paper Series

No. 02/2025

# Objectives, challenges and promises of linking the retirement age to life expectancy

**Nicole Brumm**
**Christin Czaplicki**
**Thorsten Heien**
**Mehran Seyed Hosseini**

Dezember 2025

https://doi.org/10.57823/2874-9e51

This paper was originally written as a report for the Technical Commission on Old-age, Invalidity and Survivors' Insurance of the International Social Security Association. With permission from the International Social Security Association, it is being republished as part of the DRV Discussion Paper Series.

The DRV Discussion Paper Series aims to encourage discussion of current topics in pension policy and research. The views and conclusions expressed in the papers are those of the authors and do not necessarily represent the position of Deutsche Rentenversicherung Bund.

Deutsche Rentenversicherung Bund, Abteilung Forschung und Entwicklung
Ruhrstraße 2, 10709 Berlin, Germany

issa | INTERNATIONAL SOCIAL SECURITY ASSOCIATION

WORLD SOCIAL SECURITY FORUM
KUALA LUMPUR 2025

World Social Security Forum
35th ISSA General Assembly
Kuala Lumpur, Malaysia, 29 September–3 October 2025

# Objectives, challenges and promises of linking the retirement age to life expectancy

**Nicole Brumm**
**Christin Czaplicki**
**Thorsten Heien**
**Mehran Seyed Hosseini**
**German Federal Pension Insurance, Germany**

**ISSA Technical Commission on Old-age, Invalidity and Survivors' Insurance**

The International Social Security Association (ISSA) is the world's leading international organization for social security institutions, government departments and agencies. The ISSA promotes excellence in social security administration through professional guidelines, expert knowledge, services and support to enable its members to develop dynamic social security systems and policy throughout the world.

The ISSA technical commissions play a central role in the Association. They are the backbone of its knowledge development and technical work. Organized along 13 clusters of topics, they allow ISSA members to focus their efforts in their particular area of interest.

The opinions expressed in this document do not necessarily reflect those of the ISSA or its member organizations. For copyright terms, conditions and privacy policy, please consult the ISSA website: www.issa.int/site-policy.

© International Social Security Association 2025

# Objectives, challenges and promises of linking the retirement age to life expectancy[1]

Nicole Brumm
Christin Czaplicki
Thorsten Heien
Mehran Seyed Hosseini
German Federal Pension Insurance, Germany

ISSA Technical Commission on Old-age, Invalidity and Survivors' Insurance, Geneva

***Executive summary***

*This report analyzes policy measures linking the statutory retirement age to life expectancy along multiple interdependent dimensions. It aims to identify key economic, social, political, and technical factors that influence the feasibility and success of such measures across different national contexts.*

*As part of the project, an email survey based on a structured interview was conducted among relevant stakeholders in 10 countries that have already introduced or planned such linkage mechanisms. Respondents included experts from academia, social security institutions, and responsible ministries. The survey results were instrumental in developing detailed country profiles and comparative analyses, with a particular focus on the technical design features of the reforms.*

*The findings of this report can be summarized as follows:*

*• A thorough economic evaluation of measures linking the retirement age to life expectancy and their comparison with alternative pension reforms for dealing with the consequences of demographic change requires a close examination of the institutional context. Similar pension reforms in different contexts may result in different behavioural responses with varying effects*



1. We would like to express our sincere gratitude to the representatives from Bulgaria, Cyprus, Denmark, Estonia, Finland, Greece, Italy, the Netherlands, Portugal, and the Slovak Republic for their participation in our survey and for providing valuable information. The responses were particularly instrumental in the development of the country profiles and in identifying country-specific solutions and comparative insights.
We would also like to thank the colleagues from the General Secretariat of the International Social Security Association (ISSA), the members of the Technical Commission on Old Age, Invalidity and Survivors Insurance, and the colleagues from the German Federal Pension Insurance (Deutsche Rentenversicherung Bund) for their valuable comments and support.

*for the finances of the pension systems. Furthermore, linking retirement ages to changes in life expectancy can, through substitution effects, have an impact on the finances of other welfare state institutions such as unemployment and health insurance. As the experience of the recent decade suggests, dealing with possible negative societal aspects of pension reforms or passing reforms in the face of political resistance may require complementary or compensatory measures such as early-retirement pathways which can reduce the net positive fiscal impact of the original reform.*

*• There are differences in life expectancy between different socioeconomic groups. Moreover, there is evidence that in many countries these differences are increasing. These inequalities and their worsening can put into question the fairness of measures linking retirement ages to life expectancy. Furthermore, they can endanger the economic and political success of such measures. Several explanations have been offered for the complex relationship between socioeconomic status and life expectancy, which can have varying degrees of relevance in different countries. Taking into account these explanations, different policy measures either aiming to reduce life expectancy inequalities or compensate those negatively affected by these inequalities are conceivable.*

*• From a political perspective, automatic adjustment mechanisms such as the linking of statutory retirement ages to life expectancy are thought by some to help politicians avoid blame for unpopular reforms and more generally to lead to a depoliticization of aspects of welfare state policy. However, the existing evidence from countries which have introduced a link between statutory retirement ages and life expectancy is mixed. The evidence shows that the link can be suspended, complemented after its introduction with various early-retirement pathways or redesigned after negotiation with social partners. In this context, moving beyond purely fiscal considerations in policy design and introduction of complementary measures to address concerns about fairness could help ensure the political sustainability of measures linking retirement age to life expectancy.*

*Overall, the findings suggest that a simple transfer of policies linking retirement ages to life expectancy across countries is not advisable. Reform success is highly context-dependent and critically shaped by the structural characteristics of pension systems and the broader political, social, and economic environment. Effectively addressing these specific interdependencies is essential to ensuring that the economic objectives are met without undermining social justice or political legitimacy.*



# 1. Introduction

Pension systems are far more than mere mechanisms for securing income in retirement - they are a fundamental pillar of the modern political economy. Besides their role in redistribution of income across the life-course and poverty alleviation in old age, these systems also impact, and are in turn impacted by, public finances, the labour market, the distribution of resources across society, and a variety of social, political and economic debates (Arza and Kohli, 2008b). Consequently, discussions of pension policy and the necessity of pension reform in the face of societal and economic developments often go far beyond debating the minutiae of consumption smoothing and involve a host of national and supranational actors with differing interests.

One of the societal developments which has been used to argue for the necessity of substantial pension reforms is population ageing. In recent decades, significant declines in mortality rates, particularly among older adults[2] along with a long-term decline in fertility rates, have led to population ageing in many countries and are expected to drive further ageing in the coming years.[3] Additionally, in many Western nations, indicators such as the old-age dependency ratio are projected to rise even more rapidly over the next two decades due to the post-World War II baby boom.[4]

Changes in the demographic structure of societies have the potential to significantly affect the trajectory of macroeconomic indicators such as aggregate demand and supply, saving and investment, and are also hypothesized to have an impact on economic growth. In the context of lower-than-expected growth following the Great Financial Crisis and the revived discussion on secular stagnation, much has been written about the possible negative impact of demographic change on growth and the mechanisms (such as reduced labour supply or innovation) that might explain it (see e.g. Aksoy et al., 2019; Gagnon et al., 2021). However, there is also some evidence which complicates the prevailing pessimistic narrative on the relationship between population ageing and growth: looking at GDP growth and ageing in different countries since the 1990s, Acemoglu and Restrepo (2017) do not find a negative relationship between the two, which they try to explain by pointing to increased automation in more rapidly ageing countries and the role it can play in increasing aggregate output in the face of lower labour supply.

Population ageing, insofar as it can increase the ratio of pensioners to the working population, has direct impact on the finances of public pay-as-you-go pension systems.[5] It can reduce the tax/contribution base while simultaneously requiring higher expenditure with rising number of retirees. On other hand (the design of) pension systems may help in reducing or exacerbating the expected macroeconomic effects of demographic change. In this context and mostly motivated by economic considerations, recent decades have seen of a variety of pension reforms affecting eligibility criteria, benefit calculation rules and social security contribution rates in many countries (see Fouejieu et al., 2021, Chapter 3 for a summary of recent reforms in European countries). These reforms mostly aim at dampening public pension spending and extending working lives.



However, as examples of recent pension reform reversals (Orseau and Deboeck, 2021, pp. 30–33) suggest, pension reforms motivated mainly by different notions of "fiscal sustainability" may face challenges to their own sustainability. To evaluate the chances of the long-term success of pension reforms, it may be necessary to move beyond a one-dimensional analysis of its fiscal impacts, and instead to take a multi-dimensional perspective by considering its social impacts (e.g. its interaction with existing socio-economic inequalities) and the political setting (e.g. strength of different actors and voting blocks and the necessity of compromise). Avoiding reform reversals may thus require taking "a more holistic approach to assess pension system sustainability" (Grech, 2018, p. 3).

2. However, the last 15 years have seen a decline in life expectancy gains in many countries. See Raleigh (2019) for a discussion of the slowdown in the rise of life expectancy in many OECD countries since 2011.
3. Even though (expected) population ageing is a global phenomenon, there are significant differences between regions in its speed and the corresponding role played by declining fertility rates and declining mortality rates in higher ages, respectively (see United Nations, 2024).
4. There are significant differences in the timing and the extent of the baby-boom even between European countries (Sánchez-Barricarte, 2018).
5. Here we mainly discuss the interaction of ageing with (public) pay-as-you-go pension systems, although the implications of ageing for funded pensions are not necessarily less significant (see e.g. Barr, 2002, pp. 8–9 for a simple description).

The aim of this report is to provide a multi-dimensional analysis of proposals to link the statutory retirement age to life expectancy. Since the beginning of the century, this policy measure has been adopted by several European countries and promoted by supranational bodies such as the European Commission (see European Commission, 2012). For our analysis we combine theoretical considerations with existing evidence on the consequences of increasing statutory retirement ages in general and their coupling to life expectancy in particular.

Increasing the statutory retirement age is seen by some to be preferable to other reform options such as reducing pension levels or increasing social security contribution rates or taxes[6]: Decreasing pension levels (e.g. by modification of pension indexation rules) can amongst other things negatively affect pension adequacy[7] and have consequences for the whole economy by, for example, reducing aggregate demand/expenditure.[8] Raising the contribution rates, on the other hand, will affect net incomes of workers, and possibly their spending, negatively and could also lead to a reduction in labour demand and supply and slow down economic growth (see e.g. Karam et al., 2010, pp. 7–8, 28).[9]

Increases in the statutory retirement age, especially discretionary ones, face many challenges: if life expectancy continues to rise in the future, a one-off increase may not suffice to counter fiscal pressures on the pension system and public finances. Moreover, increasing the retirement age is often very unpopular, as it usually results in de-facto benefit reductions, and thus a hazardous undertaking for political actors seeking reelection. In this context, the introduction of rules linking the statutory retirement age to life expectancy may in theory ensure the dampening of pension expenditure in the long run, reduce the necessity of taking unpopular political actions in the future, and make a painful reform less visible (Weaver, 2011).



However, as demonstrated in the following, the degree to which the economic promise of linking the retirement age to life expectancy is realized can depend significantly on the institutional context. Furthermore, the existing experience suggests that this policy measure does not manage to put an end to political discussion over the retirement age and may be vulnerable to further pension reforms which counteract its fiscal consequences. A significant challenge to the economic and political success of the policy measure is posed by existing socioeconomic inequalities and heterogeneities in life courses. Raising the retirement age disproportionately affects those in physically demanding occupations and individuals with poorer health, many of whom may be unable to extend their working lives. While existing gaps in life expectancy between different socio-economic groups (using e.g. educational attainment as a proxy) (see Murtin et al., 2017) imply that any statutory retirement age can

6. However, increasing the statutory retirement age can, through possible early-retirement deductions, result in a reduction of pension level of those unable or unwilling to extend their working lives. Even individuals who work longer may depending on pension system parameters receive lower lifetime pension then they would have otherwise received.
7. Depending on the goal of the pension system, adequacy may refer to guaranteeing a living standard similar to those enjoyed during the working life or a socially acceptable minimum living standard.
8. See e.g. Párraga Rodríguez (2023) for evidence from the EU on the effect of changes in pension benefits on aggregate expenditure and the labour market and Karam et al. (2010, p. 22) for possible short- and long-term macroeconomic consequences of a reduction in pension benefits.
9. The usual narrative regarding labour supply and labour demand effects of a rise in contribution rates has a few caveats: the contributions to pension systems with a close relationship between earnings and benefits can be seen to differ significantly from other forms of income taxation (see Burkhauser and Turner, 1985), and there is evidence that workers are aware of this relationship (see Liebman et al., 2009; Liebman and Luttmer, 2015 for evidence from the US). Moreover, labour supply elasticities vary internationally and between different groups and generally tend to be small (Bargain et al., 2014).

be deemed to be unfair, the widening of the life expectancy gap (Lübker and Murtin, 2023) implies that linking retirement age to life expectancy can have negative consequences for socio-economically disadvantaged groups which may see little or no improvements in mortality rates.

This report examines the economic, social, political, and technical dimensions of linking the retirement age to life expectancy and is guided by the following key questions:

- What economic and fiscal challenges arise from demographic ageing for pension systems?
- What are the advantages and limitations of linking the retirement age to life expectancy compared to alternative adjustment measures?
- What political opportunities and risks are associated with automatic adjustment mechanisms?
- How do technical design choices - such as the selection of life expectancy indicators - affect reform outcomes?
- How might uniform adjustments exacerbate social inequalities, and what compensatory measures could address them?
- How do institutional and political contexts shape the feasibility and durability of reforms?



The report is organized as follows: Chapter 2 points out the necessity of considering the institutional context, particularly the structural features of the pension system, for a comprehensive evaluation of the economic impacts of the policy measure and its comparison with alternative reforms. Chapter 3 gives a detailed overview of the existing evidence on the relationship between different indicators of socio-economic status and mortality and points out the challenge posed by existing inequalities to the fairness and the efficacy of the measures linking the retirement age to life expectancy. The chapter finishes with a catalogue of possible complementary policies which could improve the chances of the economic and political success of such measures. Chapter 4 discusses the role played and the challenges posed by the political system and actors for the implementation and sustainability of pension reforms in general and reforms coupling retirement age to life expectancy in particular. It points out how policy design can help gain or lose public acceptance for such reforms. Moreover, it draws on theory and international experience to describe the promises and pitfalls of automatic adjustment mechanisms such as those for statutory retirement ages. Chapter 5 follows with a conclusion. Appendix I gives an overview of the choices involved in the design of measures linking the retirement age to life expectancy. Appendix II contains country profiles for several countries which have implemented such measures detailing the choices made by each. Appendix III contains recent changes to statutory retirement ages in these countries.

## 2. The economic promise of raising the retirement age and the role of the institutional context

The institutional (and economic) context in which a measure such as raising the retirement age is implemented can significantly influence if and how the desired consequences of such a reform are realized and how the measure compares with alternatives such as a rise in contribution rates.

One of the factors possibly shaping both the response and the economic consequences of raising the retirement age is the degree to which pension benefits are related to earnings. In this respect, it is useful to consider the two ideal types of pensions system: Beveridge systems with flat-rate benefits which do not depend on lifetime contributions and Bismarck systems which ensure a close relationship between contributions and benefits.[10] In the latter longer participation in the labour market also means increased pension benefits. The prolonging of working lives as a response to higher retirement ages may thus not have a significant dampening effect on contribution rates in Bismarckian systems (Vogt and Althammer, 2016; see also OECD, 2021, pp. 94–95). Simulations by Vogt and Althammer (2016, p. R27) studying the effect of linking the retirement age to life expectancy in the German pension system support the latter hypothesis. However, simulations of Werding et al. (2024, p. 22) show a larger expected effect of the adoption of the policy measure than those of Vogt and Althammer (2016). For Bismarckian systems, the more straightforward fiscal consequence may arise from individuals who do not change their retirement behaviour and are forced to use early retirement pathways with actuarial deductions which will increase with the raising of the retirement age. For Beveridge-type systems, in which the pension levels are not strongly coupled to the duration and extent of employment, the expected effect of prolonging working lives on the development of contribution rates and more generally pension expenditure is more straightforward.[11] Besides the preceding discussion on the mechanics of fiscal consequences of raising the retirement age in different pension systems, it is also important to note the possible varying effects of different pension systems on the behavioural responses to reforms (see e.g. Lee, 2024).



Notwithstanding, the above-mentioned ambiguity and system-dependency of the financial consequences of longer working lives for pension systems, increased labour market participation of the elderly, can, for example by increasing the tax base, be beneficial for other institutions of the welfare state, such as unemployment and health insurance, and for the broader economy (e.g. by reducing possible labour shortages exacerbated by demographic change). A natural question is, therefore, the extent to which raising the statutory retirement age leads to higher employment rates. Evidence from several countries confirm significant positive effects on employment rate of the elderly as a reaction to increase in both normal and early retirement ages (Staubli and Zweimüller, 2013; Rabaté and Rochut, 2020; Geyer et al., 2020; Soosaar et al., 2021). However, despite agreement on the significance of the employment effects, the estimates on the size of the employment response vary considerably, which points at the possible role of the institutional context or more general "contextual factors" (Soosaar et al., 2021, p. 319) in shaping the behavioural response to the raising of the retirement age (see Soosaar et al., 2021).

Counteracting the above desired positive fiscal impacts, increasing the statutory retirement age may result in increased uptake of unemployment benefits, disability benefits, and sick leave, as not everyone may be able or willing to work longer. Such substitution effects necessitate looking beyond the pension system when estimating economic consequences of rising retirement ages. Estimations by Staubli and Zweimüller (2013, p. 30) and Rabaté and Rochut (2020, p. 303) show that despite positive net fiscal impact arising from the short-term response to the raising of statutory retirement ages, the

10. Many pension systems can contain elements of both ideal types. Moreover, within Bismarckian systems there are different approaches to linking benefits and earnings (compare notional defined contribution systems and point-based systems used e.g. in Poland and Germany, respectively).
11. However, as pointed out in the following the actual consequences of raising the retirement age depend on a variety of factors.

negative fiscal impact for other institutions of social insurance such as unemployment insurance can be considerable. In general, the extent of such negative impacts will depend among other factors on the rules governing the access of the elderly to unemployment and disability benefits.

A thorough evaluation of proposals for raising the retirement age should also consider possible measures which may be seen to be necessary if the proposals are deemed to lead to unacceptable reductions in old-age incomes and unacceptable distributional consequences (see Grech, 2018 and Chapter 3 below).[12] Reductions in old-age income may occur for those who are unable or unwilling to prolong their working lives and are faced with higher actuarial deductions due to a rising statutory retirement age or with possibly low disability or unemployment benefits. In countries where unemployment or disability benefits tend to be lower than pension benefits, the distributional impact of raising statutory retirement ages may be regressive (see Rabaté and Rochut, 2020, p. 303). Such concerns could lead to further policy measures relaxing eligibility rules for parts of the population, thus further reducing potential fiscal gains in the long run. The relaxation of eligibility criteria for individuals with long contribution histories in Germany and Italy simultaneously to and following the decision to increase statutory retirement ages, respectively, could be seen in this light (see Chapter 4).[13]

The multiple ways in which the institutional and economic context influences the consequences of policy measures raising the statutory retirement age make general assertions on their preferability to a deduction of pension levels or a rise in contribution rates difficult (if not impossible). Such assertions require assumptions which may significantly impact their general validity.[14]



The economic impact of policy measures linking the retirement age to life expectancy also depends on policy design, which is influenced not only by economic but also by social and political considerations (see Chapter 3 and Chapter 4). A detailed discussion of the choices involved and of international differences in the design of policies linking retirement age to life expectancy can be found in Appendix A. In the remainder of this section, we briefly discuss two aspects of policy design that are particularly relevant from an economic perspective: the tightness of the coupling and the choice between period and cohort life expectancy.[15]

Proposals to formally link retirement age to life expectancy emerged as early as 1983, when a bill presented to the Finance Committee of the US Senate, called for discretionary increases in the retirement age followed by automatic adjustments to maintain a stable ratio between working years (starting at age 20) and life expectancy at retirement (Myers, 1985, p. 288).[16] Since then, many similar

12. See e.g. Aspegren et al. (2019, pp. 8–9) for a discussion of adequacy concerns in Sweden following previous pension reforms and some measures for addressing them.
13. See Dolls and Krolage (2023) and Casale (2020) for more information on the German and Italian case, respectively. Furthermore, it is out of the scope of this chapter to discuss the extent to which the length of the contribution history is a good indicator for determining those who are most negatively affected by a rise in the statutory retirement age.
14. The example of Karam et al. (2010) is instructive. The study assumes that a rise in statutory retirement age leads to a rise in the effective retirement age by the same amount, which does not reflect empirical studies; that longer working lives do not increase pension levels (Beveridge pension regime); that labour supply elasticity is equal to 0.5, which seems to be higher than estimates for most countries (see Bargain et al., 2014 and Footnote 9). Furthermore, the study does not seem to sufficiently consider the negative impact for other institutions of social insurance, nor does it consider the role of changing social security contribution on labour demand. Some of these limitations are mentioned in Karam et al. (2010, p. 12).
15. See Appendix I for a more detailed discussion of the difference between these notions of life expectancy.
16. The automatic adjustment proposal did not make it through the committee (Myers, 1985, p. 288).

proposals have been made, aiming at or in effect resulting in a roughly fixed ratio of working life to expected time in retirement (Aaron and Reischauer, 1998, p. 101; Schmähl and Viebrok, 2000, p. 57; Börsch-Supan, 2007, p. 11) and have been adopted in some countries, such as Portugal, Finland and the Netherlands. More concretely, and disregarding international differences in implementation and life expectancy, such proposals would roughly result in an 8-m increase in the retirement age, given a 1-year increase in life expectancy. Other proposals for a fixed number of years in retirement also have a long history (see e.g. Myers 1985, p. 472). These proposals require a 1:1 coupling of the retirement age to life expectancy and have since been adopted in several countries, such as Denmark, Italy and Estonia.

Proposals regarding the tightness of the link between the retirement age and the life expectancy are often presented, as is the case in most of the literature cited above, without much theoretical discussion as options which would reduce the fiscal pressure on pension systems. More systematic studies of the question on the importance and consequences of technical design of the policy, in particular the strength of the link between retirement age and life expectancy, are undertaken by Meneu et al. (2016) and Bravo et al. (2023). Their starting point is a notion of "intergenerational actuarial neutrality (or fairness)" which can roughly be defined as individuals from different cohorts enjoying equal internal rates of return (see Meneu et al., 2016, p. 93; Bravo et al., 2023, pp. 164–165). Besides pointing out the possibility of using alternative measures such as an increase in contribution rates or reduction in pension benefits, these studies discuss in detail how policies linking the retirement age to life expectancy should be designed to maintain intergenerational actuarial neutrality amid increasing life expectancy.



Regardless of the limitations posed by the assumptions and the one-dimensional notion of intergenerational fairness used in these studies, their results show the importance of taking into consideration the structural features of the pension system when designing policy measures. They show that for (Bismarck-type) pension systems in which entitlements and the replacement rates increase with longer working lives, their notion of intergenerational fairness requires a stronger link between the retirement age and the life expectancy than in pension systems with constant replacement rates (Meneu et al., 2016, pp. 96–97). Under certain assumptions it can be shown that in the former pension systems maintaining intergenerational actuarial neutrality requires fixing the (expected) time spent in retirement, whereas in the latter pension systems fixing the ratio of the working life to time spent in retirement would suffice (Bravo et al., 2023, pp. 166–167).

Finally, it is important to note that the above results require the use of cohort life expectancies which, however, can only be computed after all members of a cohort have died. Notwithstanding the variety of approaches for estimating cohort life expectancies for living cohorts by projection of mortality trends, the use of such estimated life expectancies for determination of future retirement ages could be problematic: besides the uncertainties associated with the choice of the projection method and the assumption that certain long-term mortality trends will continue, the resulting estimates may be very insensitive to short-term stagnation or increase in mortality rates (as observed e.g. during the COVID-19 pandemic). Thus, linking the retirement age to life expectancy using such estimates may result in automatic increases in the retirement age even in periods with increasing mortality which could reduce the acceptance of automatic adjustments. In practice, all countries appearing in Appendix II with the exception of the Netherlands (which uses projected period life expectancies) use life expectancy indicators computed solely using observed mortality rates (see Appendix I for

more details). For a more detailed discussion of how the design of the policy measure can affect its political acceptance and feasibility see Chapter 4.

# 3. The social aspects of coupling retirement age to life expectancy

The following chapter addresses the socio-economic inequalities that can affect the concrete design of pension reforms and the reform process. A general concern about mechanisms coupling the retirement age to life expectancy – but also about raising the retirement age in general – is a) that not everyone will be able to work until the new age limit (which will usually be higher; see Chapter 3.2) and b) that due to differential life expectancy/mortality, the policy measure could have non-intended regressive effects and shorten the retirement period of those with lower socio-economic status (i.e., with lower education, lower income, etc.) with subaverage gains in life expectancy compared to those with higher socio-economic status (Alvarez et al., 2021; Sánchez-Romero et al., 2024; Majer et al, 2011).[17] This applies all the more since these socio-economic differences have grown even further in the recent past (Grigoriev and Doblhammer, 2019; Mackenbach et al., 2017; Sasson, 2016;). If this is the case and the difference in life expectancy is due to structural reasons (and not under the control of those affected), consideration should be given to how to respond appropriately when designing pension policies coupling the retirement age to life expectancy. In the following, we therefore discuss 1) by means of which data and which indicators life expectancy and mortality are measured (best), 2) the empirical results with respect to these indicators for people with different socio-economic status, 3) the causal mechanisms behind these socio-economic differences, and 4) the implications for policy measures coupling the retirement age to life expectancy (prevention, intervention, and compensation).



## 3.1. Data and indicators of life expectancy/mortality

From a methodological point of view, to get valid and reliable information and to reduce statistical uncertainties linking information from a national census with population registers (including state registers for social benefits or tax surveys) as done in Nordic countries like Denmark, Finland, Norway, and Sweden, offers the best data source for the analysis of socio-economic differences with respect life expectancy and mortality. As a second-best option, especially when the existing data sets contain less information, large representative samples of the population are surveyed. The respondents are then followed up during a mortality follow-up (e.g. lasting five years) using population registers. This also enables to analyze social determinants of individual causes of death to get a deeper understanding of causal mecha-nisms (Kroll and Lampert, 2009, p. 5; see Haan and Schaller, 2021; Lampert et al., 2019). Mortality follow-ups are also done for scientific surveys like the "Survey of Health, Ageing and Retire¬ment in Europe" (SHARE) or the "German Socio-Economic Panel" (GSOEP) offering even more back¬ground information. However, this goes along with smaller sample sizes and – at least for longi¬tudinal surveys – a potential bias due to panel attrition usually being associated with health and illness in old age (Haan and Schaller, 2021). Finally, health and pension insurance data can be used for the analysis of socio-economic differences with respect life

17. In the following we will mostly focus on the second aspect. However, many policy conclusions with respect to differential life expectancy/mortality (see Chapter 3.2) are also relevant for the first aspect (e.g. prevention, intervention).

expectancy and mortality, too (e.g.[18] Brumm and Römer, 2019; Himmelreicher et al., 2008; Kroll and Lampert, 2009).

Life expectancy and mortality are closely related demographic measures providing insights into the health and longevity of a given population: more precisely, life expectancy indicators provide summaries of mortality rates. As mortality rates decrease, life expectancy increases, and vice versa.[19] Generally, life expectancy represents the average number of years a person can expect to live after reaching a certain age, given a set of observed or predicted mortality rates.

The most widely used indicators of life expectancy (LE) are life expectancy at birth (LEB) and longer life expectancy, often expressed as life expectancy at age 65 (LE65). Although the chances of reaching the age of 65 also differ systematically between socio-economic groups (Haan and Schaller, 2021, p. 31; see Lampert et al., 2019), LE65 is the more relevant indicator with respect to questions concerning raising the retirement age. The concept of life expectancy just described can be generalized to obtain further relevant, but at times harder to measure indicators, such as working, healthy, physical, and cognitive life expectancy (WLE, HLE, PLE, CLE), i.e. "the number of years a person is expected to be economically active and generally, physically, and cognitively healthy" (Weber and Loichinger, 2022, p. 78; see Dudel et al., 2023, Majer et al., 2011).[20] In the following the terms "life expectancy" and "mortality" are used in this generalized sense.

## 3.2. Life expectancy/mortality of different socio-economic groups



When analyzing socio-economic differences with respect to life expectancy and mortality, there's a strong focus on closely correlated status indicators like education (Balaj et al., 2024; Grigoriev and Doblhammer, 2019; Huisman et al., 2004; Mackenbach et al., 2003, 2008, 2015; Sasson 2016; Weber and Loichinger, 2022), occupation or occupational status (Deeg et al., 2021; Ebeling et al. 2023; Himmelreicher et al., 2008; Hoffmann et al., 2020; Lundin et al., 2010; Mackenbach et al., 2003, 2008), income (Chetty et al., 2016; Haan and Schaller, 2021; Klein and Unger, 2001; Kröger et al., 2017; Lampert et al., 2019),[21] and wealth (Alvarez et al., 2021; Huisman et al., 2004). However, their corre¬lation with life expectancy/mortality differs between studies and social groups, for different countries or over time. Notwithstanding, people with higher socio-economic status overall tend to live longer than those with a lower socio-economic status.[22]

To give some empirical examples, Balaj et al. (2024) found an average reduction in mortality risk of 1.9% per additional year of education based on a meta-analysis of more than 600 worldwide studies. For 10 countries participating in the European Community Household Panel, Majer et al.

18. However, the major disadvantages of this approach are, "that deaths are only examined after retirement. Information on premature mortality, which is particularly pronounced among the socially disadvantaged, is not available. … Because the background characteristics collected are not needed to carry out the routine tasks, there are often gaps in the data" (Kroll and Lampert, 2009, p. 7).
19. Depending on the ages at which changes in mortality rates occur and life expectancy are calculated.
20. A variation of these measures with a different focus is the life expectancy without (CFLE) and with (CLE) long-term care (Grigoriev and Doblhammer, 2019).
21. While most authors – not least due to data availability – focus on the actual income when referring to socio-economic differences, at least a few authors analyze the relationship between lifetime earnings and life expectancy (see Brumm and Römer, 2019; Himmelreicher et al., 2008; von Gaudecker and Scholz, 2006).
22. The political ramifications of socio-economic disparities in life expectancy, particularly regarding support for retirement age reforms, are examined in greater depth in Chapter 4.

(2011) determined a LE65 difference between high and low educated groups of 3.0 years for men and 1.9 years for women, while for disability free life expectancy the difference was 4.6 years for men and 4.4 years for women.

With respect to occupational aspects and based on national register-based data from Japan, South Korea, and eight European countries, Tanaka et al. (2019) found that in Europe "manual workers had 1.6–2.5 times higher mortality than upper non-manual workers. However, in the most recent time-period, upper non-manual workers had higher mortality than manual workers in Japan and South Korea … due to rising mortality from cancer and external causes (including suicide), in addition to strong mortality declines among lower non-manual and manual workers" (Tanaka et al., 2019, p. 750). In their review of 29 studies on socio-economic differences in life expectancy in Europe, Mosquera et al. (2019) conclude that LE65 differences "between top and bottom occupational groups are of about 2-3 years in Germany, Norway, Sweden and almost 5 years in France" (OECD, 2023, p. 104). Finally, Head et al. (2019) determined in four cohort studies in England, Finland, France, and Sweden, that "those in higher occupational positions could expect more years in good health (2.1–6.8 years) and without chronic diseases (0.5–2.3 years) from ages 50 to 75" (Head et al., 2019, p. 267).

Differences in life expectancy and mortality with respect to income and wealth have been shown for many countries (Brønnum-Hansen and Baadsgaard, 2012; Chetty et al., 2016; Frova et al., 2024; Hoffmann et al., 2020; Huisman et al., 2004; Kröger et al., 2017; Lampert et al., 2019). However, mainly due to measurement issues results are often more difficult to compare than for other indicators (Shi et al., 2021). Using GSOEP-data, Lampert et al. (2019) determined differences in LE65 between the lowest and highest income groups of 3.7 years for women and 6.6 years for men in Germany. Furthermore, based on data from mortality registries linked with population census data of 11 countries and regions of Europe Huisman et al. (2004) found up to twice as high mortality rates for male homeowners aged 50 to 59 compared to tenants of the same age (Finland, Denmark, England, Wales), while the differences were somewhat smaller for women.



A further look at socio-economic differences in life expectancy and mortality by social groups shows that – as hinted at before (see also Majer et al., 2011) – the differences are often smaller for women than for men (Bohacek, 2015; Haan and Schaller, 2021). Contrarily, there's no clear evidence whether socio-economic differences tend to decrease or increase with age (Cutler and Lleras-Munay, 2006; Hummer and Lariscy, 2011; Huisman et al., 2004; Majer et al., 2011).[23] Another frequently found correlation is that socio-economic differences with respect to life expectancy and mortality differ between countries or regions (Bambra, 2011; Bergqvist et al., 2013; Eikemo et al., 2008).[24] Finally, various studies have shown that the general upward trend in life expectancy in the recent decades – with the exception of some countries (e.g. USA, Russia) and certain periods such as during the COVID-19 pandemic (Ayuso et al., 2016; Islam et al., 2021; WHO, 2024)[25] – has been accompanied

23. Regarding migrants, it is still an open question whether they have an advantage compared to the native population or whether the "healthy migrant effect" is primarily a statistical artifact (Helgesson et al., 2019; Moullan and Jusot, 2014; Wallace and Wilson, 2022).
24. Next to gender-, age-, and country-specific socio-economic differences with respect to life expectancy and mortality, there are of course genuine gender, age, and country differences, too, with women exhibiting a higher life expectancy than men, mortality usually increasing with age, and with some Asian (especially Hong Kong, Japan, South Korea) and (southern) European countries (especially Italy, Spain) with the highest life expectancy worldwide (see Ayuso et al., 2016; Chang et al., 2008; Haan and Schaller, 2021; Huisman et al., 2004; Klein and Unger, 2001; Kröger et al., 2017).
25. However, countries like the UK, France, Germany, Sweden, and Netherlands have seen a slowdown in improvements in life expectancy since 2011, too (Raleigh, 2019).

by an increasing inequality in (different notions of) life expectancy between socio-economic groups (Grigo¬riev and Doblhammer, 2019; Mackenbach et al., 2003; 2015, 2017; Meara et al., 2008; Sasson, 2016).

## 3.3. Causal mechanisms behind differences in life expectancy/mortality

The potential causal mechanisms behind the relationship between socio-economic situation and life expectancy are manifold with the latter affected by the former directly and indirectly, i.e. mediated via other factors, and mechanisms sometimes working in both direc¬tions (see Ardito and Costa, 2022; Bambra, 2011; Case and Deaton, 2003; Kröger et al., 2017):

- A first approach focuses on living conditions, including food and housing, that are primarily dependent on occupation, income, and wealth, with the extreme case of poverty significantly decreasing life expectancy (Marmot et al., 1991; Marmot, 1994).
- Next to living conditions, working conditions – primarily depending on education and occupation – define exposures to physical and psychosocial risk factors with unhealthy circumstances leading to lower life expectancy (Case and Deaton, 2003; Fletcher and Sindelar, 2009).[26]
- Furthermore, resources-based inequalities in access to medical goods and services of care and prevention cause – even in countries with universal health and long-term care systems – differential life expectancy and mortality (Phelan et al., 2010).
- There's also a link between the socio-economic situation and health-related behaviour as well as corresponding attitudes, values, and norms, with the latter culturally legitimizing unhealthy "lifestyles" including dietary habits, smoking, alcohol and drug consumption, and physical activity (Feinstein, 1993; Li et al., 2018).
- The life course approach does not offer a new explanation but combines the other approaches in a longitudinal perspective emphasizing the importance of the accumulation of social, psychological, and biological advantages and disadvantages over time for life expectancy and mortality (Power and Kuh, 2006; Weber and Loichinger, 2022).
- Finally, the health selection approach turns around the relationship between socio-economic situation on the one hand and life expectancy and mortality on the other hand: "Individuals who are 'fitter' are more likely to move up the social hierarchy. In contrast, people with ill health are downwardly mobile (or less upwardly mobile) and are therefore concentrated within the lower socioeconomic classes" (Bambra, 2011, p. 742).

Next to these explanations, there are also factors determining both socio-economic situation and life expectancy: "Among many potential candidates are genetics, ability, intelligence, social skills, networks, and other background or early life factors such as parental income" (von Gaudecker and Scholz, 2006, p. 3; see Smith, 2004). Finally, the relationship between socio-economic

26. In a broader perspective, some authors refer to general effects of social inequality, leading "to long-term feelings of subordination or inferiority, which in turn stimulate chronic stress responses that have profound consequences for physical and mental health" (Bambra, 2011, p. 742).

situation and mortality can depend on the specific temporal and social context including national prosperity (e.g. measured as GDP), political traditions, welfare state type, social spendings and transfers, health and work safety policies, quality of government, social inequality, environmental conditions, crises and wars, but also cultural aspects like predominant values and norms (Ayuso et al., 2016; Bergqvist et al., 2013; Eikemo et al., 2008; Espelt et al., 2008; Mackenbach, 2015).

Due to the multidimensionality of the socio-economic situation on the one hand and life expec¬tancy and mortality on the other hand, the complex relationship between them – moreover when comparing over time or across countries – and the high demands on empirical data to adequately depict the relationship and its causality (e.g. by longitudinal data or natural experi¬ments), to answer which mechanisms have a significant influence on life expectancy and mortality and how large it is – especially compared to other influences – is difficult (Eliason and Storrie, 2009; Hoffmann et al., 2020; Kröger et al., 2017; Mackenbach 2020). In this context, many results suggest that unequal life expectancy and mortality are a complete expression of unequal living and working conditions or unequal behaviour influenced by them. However, the influence of free will – i.e., the ability to choose between different behavioural options – cannot be ignored in this respect: "For example, the finding that health inequalities within countries are not smaller in European countries with more egalitarian social policies, such as the Nordic countries, suggests that health inequalities are not primarily determined by inequalities in material living conditions" (Mackenbach et al., 2017, p. 44). Against the background of the generally rather negative attitudes of large parts of the population towards raising the retirement age (see Frommert et al. 2009; Hofäcker, 2015), this is also relevant for the accompanying measures discussed in the following, that may be necessary if the retirement age should be linked to life expectancy.



## 3.4. Policy conclusions

To address socioeconomic differences with respect to life expectancy and mortality, policy-makers can implement a variety of measures to ensure that coupling the retirement age to life expectancy (or a discretionary rise in the retirement age) does not dispro¬portionately affect disadvantaged groups with lower socioeconomic status (and to cope with people who are not able to work until a higher retirement age). These measures can be grouped either accor¬ding to the section of the life course which is impacted by them – from early childhood to retirement – or whether they aim to avoid or at least reduce the severity of the impact of socioeconomic status on life expectancy (prevention and intervention) or compensate for life expectancy differences (compensation). In the following, we apply the first approach.

- If a lower life expectancy or a higher mortality result from educational and occupational differences (and of the yielding differences in income and wealth) a first strategy should be to reduce these differences by means of enhanced and lifelong education and training including retraining and up-skilling opportunities for older workers but also by improving job opportunities for them, especially in less demanding jobs. However, these measures will take some time to become effective and they will most probably not eliminate all relevant differences either.
- Secondly, interventions at the workplace should improve "organizational, physical, and psychosocial working conditions", especially to limit the risks of hazardous or arduous jobs and "to slow down the decline in work capacity": "These include workplaces

accom¬modation by improving working conditions, the accommodation of tasks and the working environment across the working life depending on the workers' actual work capacity, increasing flexible time schedules, with reduction, or elimination of shift work and transfer to more light work or tutoring tasks" (Ardito and Costa, 2022, p. 3; OECD, 2023).

- Thirdly, targeted health interventions should expand access to health care (if not universally available), implement physical and mental health promotion programs (including healthier lifestyles), and address occupational health risks (Haan and Schaller, 2021; OECD, 2023).[27]
- Fourthly, flexible work arrangements and gradual retirement in terms of working hours (e.g. part-time work), workplace (e.g. remote work), and job roles (e.g. less strenuous or demanding tasks) can help to expand working lives in general but also of those with lower socioeconomic status.
- Finally, is a rich literature on policy options to re-design a given pension scheme to compensate for socio-economic differences with respect to life expectancy and mortality. Generally, these options can be differentiated according to the stage at which compensation takes place: contribution payment (accumulation), benefit calculation (annuitization), and benefit disbursement (decumulation; Ayuso et al., 2017, p. 11).
  - For the accumulation stage this includes e.g. contribution rates and/or retire-ment ages according to socio-economic status (or one of its indicators like education, occupation or income) (Ayuso et al., 2017; Deeg et al., 2021).
  - For the annuitization stage benefit calculations accor¬ding to socio-economic status to reflect inequalities in life expectancy are discussed as well as eligibility for retirement benefits based on years of contributions or early (late) pension claiming adjustments depending on life expectancy (Ayuso et al., 2017; Diakite and Devolder, 2021; Sánchez-Romero et al., 2024).
  - Finally, options for the decumulation stage include indexations of annual bene-fits by socio-economic status or life expectancy or general pension indexa¬tions using price indices (instead of wage-based indexations) but also more specific proposals like front-loading benefit schemes for people with lower life expectancy (Ayuso et al., 2017; Vandenberghe, 2024).
  - Since all options for redesigning a given old-age pension scheme depend more or less on the availability of suitable and valid indicators of the current and future socio-economic status and estimates of life expectancy for different socio-



27. Addressing these risks is important for two reasons: "First, information must be conveyed as a moral imperative to ensure that workers accept the jobs in full knowledge of the facts. Second, informing about the risks helps workers weigh different job opportunities and ask to be compensated for the risks to be taken, which in turn contributes to internalizing the negative impact of those jobs, mainly by raising their cost and therefore the price of related goods and services" (OECD, 2023: 123).

economic groups,[28] many authors propose an introduction or strengthening of easier to design disability pensions or minimum pensions (Ardito and Costa, 2022; Haan and Schaller, 2021; OECD, 2023).

As already mentioned with respect to pension (re-)design, all strategies and measures have their conceptual, empirical, and operational advantages and disadvantages on their own and even more so in combination with each other, additionally depending on the specific economic, societal, political, temporal and – last not least – institutional context (Beveridge vs. Bismarck types). Even if there are some seemingly clear cases where the solution is obvious – e.g. expanding access to health care in the USA – they will not be further discussed in detail here. However, independent of the chosen strategy or measure to address socioeconomic differences with respect to life expectancy and mortality, the solution should be operational, transparent, and well-balanced regarding social, political and financial feasibility and sustainability.

All strategies have their conceptual, empirical, and operational advantages and disadvantages on its own and even more so in combination with each other, additionally depending on the specific economic, societal, political, temporal and institutional context (Beveridge vs. Bismarck types). However, independent of the chosen strategy the solution should be operational, transparent, and well-balanced regarding social, political and financial feasibility and sustainability.



# 4. The politics of linking retirement age to life expectancy

Pension systems, as the largest public transfer programs, are shaped by a complex interplay of economic, demographic, labour market, social and political forces (Arza and Kohli, 2008a). In this multifaceted context, linking the retirement age to life expectancy is pursued to depoliticize pension reform to achieve broader fiscal and social objectives. An important goal is the introduction of an automatic adjustment mechanism that shields the reform process from short-term electoral fluctuations and changing political agendas (Weaver, 2010). This approach is intended to provide long-term stability and predictability, and can at the same time increase public trust in the sustainability of pension schemes. However, the political challenges of this linkage go far beyond the technical aspects of automatic adjustment mechanisms. This chapter explores the political dimensions of linking retirement age to life expectancy, focusing on the differences between political systems, the role of various actors, and the strategies employed by different countries to address these challenges.

## 4.1. Political dynamics of retirement age reform: systems, actors

The pension reform process, particularly the raising of retirement age and linking it to life expectancy, is associated with political challenges that need to be carefully addressed before implementation. These challenges are determined by institutional constraints, public opinion, interest groups and

28. A potential weakness of early retirement provisions for specific groups, for example, is that they can be too narrowly or to broadly defined either not allowing people to retire or providing disincentives to continue working for people who can actually work. In Germany, for example, people are allowed to retire early without deductions after a particularly long working career of 45 years, as it is assumed that these are disproportionately often people who have worked hard for a long time. However, "the duration of a working career is only a very rough indicator of the burdens associated with employment: The average occupational stress is particularly high with a shorter career, while they are often rather low for a longer career" (Buslei et al., 2024; p. 760).

supranational actors. Each of these elements interact in complex ways and influence how pension reforms are formulated, negotiated and ultimately implemented.

Theoretical frameworks are essential for understanding the political dynamics of pension reforms, especially the challenge of raising the retirement age.

Institutional characteristics (e.g. consensual vs. majoritarian democracies), constraints and veto players can shape the dimensions of reform and the reform process (Lijphart, 2012; Tsebelis, 2002). Reforms which are implemented gradually and are based on negotiations between political parties, trade unions and employer organizations may enjoy broader support and may have a higher chance of long-term success (see Lijphart, 2012, Chapter 15). At the same time, the need to form broad coalitions and compromise can slow down decision-making and make it difficult to implement far-reaching changes (see Tsebelis, 2002, Chapter 7).

The examples of implementation and the aftermath of retirement age reforms in Netherlands and Italy show both the possible pitfalls of a unilateral approach to reform and the modulating effect of the involvement of social partners, especially trade unions. The Netherlands provides an example of a country in which tripartite consultation, despite recent signs of its weakening, has traditionally played a significant role in welfare policy (see van Gerven, 2019, p. 391). There, a discretionary rise in the statutory retirement age was passed and a link between the retirement age and life expectancy was introduced in 2012 without the consent of the social partners (van Gerven, 2019, p. 393). This approach possibly had negative consequences for further reform measures and finally led to significant changes (including deduction-free early-retirement options for workers in physically demanding jobs and moderation of the strength of the link between retirement age and life expectancy) to the original pension reform after negotiations with the social partners (Hemerijck and Huguenot-Noël, 2020).[29] In Italy the unpopular Monti-Fornero reform of 2011, amongst other things, severely restricted access to early-retirement options and strengthened the previously introduced link between retirement age and life expectancy (Casale, 2020, pp. 104–105) without negotiations with social partners, giving rise to a "rupture with the trade unions" (Fornero, 2020, p. 62, own translation). However, already by 2017 "following negotiation with trade unions" additional equity-oriented measures were introduced to allow easier access to early retirement for certain categories of workers (Jessoula, 2017). These measures were followed in 2019 by a popular and more comprehensive early-retirement scheme (Quota 100) (Casale 2020) and then by Quota 102 and Quota 103, which has become hard to roll back (see Reuters, 2023; see also Natili and Jessoula, 2025 for a detailed description of the expansionary turn in welfare policy in Italy following the austerity measures passed during the crisis).



Public opinion further complicates the political landscape, forcing policymakers to carefully manage public expectations and perceptions while balancing the need for pension reform with the risk of alienating key constituencies, particularly older citizens (see Vis, 2016). Pension reforms that involve raising the retirement age tend to be unpopular, as they directly affect a significant share of the electorate and raise concerns about fairness and the adequacy of social protection for older workers who may not be able to prolong their working lives (see Hinrichs, 2021, p. 414 and Chapter 3 above). In particular, concern among older voters, whose substantial voting power – the so-called "grey vote" – can make policymakers particularly sensitive to their preferences and affect potential

29. See Appendix II for links to relevant legislation (in Dutch).

reforms (see Vlandas, 2023, pp. 456–457; Tepe and Vanhuysse, 2009 presents a less clear picture). As Natali and Rhodes (2008, pp. 39–41) argue, reforms in the late 1990s and early 2000s reflected a strategic balancing act between long-term policy objectives (such as fiscal sustainability), vote-related considerations (avoiding open confrontation with key groups), and office-seeking motives (sustaining political consensus). To accommodate these goals, reforms were often implemented gradually and framed in technocratic terms to minimize resistance. Enacting unpopular measures while avoiding political costs can be seen to be the political motive behind adoption of automatic adjustment mechanisms such as linking retirement ages to life expectancy (Bosworth and Weaver, 2011, pp. 9–10). Furthermore, the design of such measures can also be guided by fear of public opinion.

Supranational influences significantly alter the pension reform landscape, adding substantial complexity to domestic policy development processes. The European Union, through its increasingly sophisticated governance mechanisms such as the European Semester and country-specific recommendations, has consistently urged member states to enhance pension sustainability by, amongst other measures, linking retirement age to life expectancy (Clauwaert, 2013; Guardiancich et al., 2022). Even though suggestions for specific reforms may be technically non-binding, they can be influential in the context of conditional aids or grants and European fiscal rules, as suggested by the adoption of measures linking retirement age to life expectancy in Italy, Greece and Slovakia for example. However, as suggested by the developments following the Monti-Fornero reforms the evidence regarding the political sustainability of supranationally motivated and domestically contentious reforms is mixed. Slovakia provides another interesting example of the power and limitations of supranational institutions in shaping national pension policies. Following explicit EU recommendations, Slovakia implemented retirement age indexation in 2012 as part of a broader pension reform package, which came into force for the first time in 2017. Yet in 2019 the Slovak parliament capped the statutory retirement age at 64, effectively undoing the earlier reform (Hwang and Roehn, 2022). The indexation mechanism was later reintroduced in the context of reform commitments associated with Slovakia's application for funding under the EU Recovery and Resilience Facility (see European Commission, 2021).



These cases reveal a fundamental tension in multi-level pension governance and the power and limits of supranational institutions in shaping the often-contested pension policies (Guardiancich et al., 2022). While pressure from supranational institutions may prompt structural changes, the long-term resilience of reforms often depends on the institutional context and the degree of inclusive governance. This raises the question of how different political systems manage conflict, foster legitimacy, and recalibrate policy over time. In Portugal and Greece, major pension reforms were enacted as part of rapidly implemented austerity programmes and met with public resistance, especially due to their perception as externally imposed measures rather than domestically negotiated solutions (Theodoropoulou, 2015; Vidal, 2019). Among other things, pressure from supranational institutions, austerity measures, including pension reforms, can lead to a "democracy without choice" and a "crisis of representation" (Vidal, 2019, pp. 12–13), which can lead to public dissatisfaction and mobilization against reforms. The cumulative evidence thus suggests that externally mandated reforms, despite their technical merits and fiscal rationale, face implementation challenges and sustainability risks when lacking sufficient domestic support.

## 4.2. Balancing technical design and public acceptance in linking retirement age to life expectancy

The technical implementation of pension reforms – particularly those that link the retirement age to life expectancy – requires a carefully calibrated design to reconcile fiscal objectives with political feasibility and public consent. The core idea behind automatic adjustment mechanisms is to depoliticize pension policy by embedding demographic responsiveness into legislation, thereby decoupling decisions from short-term electoral cycles (Weaver, 1986; 2011). The legitimacy of pension reforms cannot be assessed solely on the basis of fiscal sustainability or technical design. As Arza and Kohli (2008b) argue, it is closely linked to public perceptions of fairness and equity, which in turn depend on how the reforms affect different social groups. They emphasize that "the connection between institutional design and outcomes is very complex", especially given the "differential impact of different instruments on different social groups" (Arza and Kohli, 2008b: 17). This requires policy makers not only to consider the distributional effects of reform measures by gender and cohort, but also to anticipate how, for example, evolving employment and family patterns will interact with these reforms. Against this background, it can be argued that transparent institutional frameworks, clearly communicated explanations and compensatory strategies for disadvantaged groups should be considered as essential components of pension reforms, as these can promote both legitimacy and long-term political feasibility.



One important aspect of design of policies linking retirement age to life expectancy is the choice of life expectancy indicators, which itself has multiple dimensions such as the choice between period and cohort life expectancies or between the use of projected or observed mortality rates. The countries more closely studied as part of this project mainly show differences with respect to another dimension. Namely, the extent of application of smoothing methods in the computation of life expectancy indicators. Smoothing mortality data (e.g. using multi-year averages) can reduce volatility and make adjustments more stable and acceptable, especially during shocks like COVID-19. Contrasting examples are provided by Denmark and Slovakia which use 2 and 12 observation years, respectively. A counterpoint to the above statement on the possible desirability of more gradual changes as a result of smoothing is that they may still lead to controversial increases in the retirement age even in the face of a significant short-term drop in life expectancy.

Another important and perhaps more contentious design aspect of policies linking retirement ages to life expectancy is the strength of this link, which can, amongst other things, affect their political acceptance. The Netherlands, one of the countries which originally opted for 1:1 coupling of retirement age to life expectancy, has since backtracked and chosen a retirement age adjustment formula which only adds two-thirds of life expectancy changes to the previous retirement age, while in Denmark which also chose a 1:1 coupling there has been recent debates to decrease the strength of the coupling (see von Nordheim and Kvist, 2022, p. 96).

Fairness – particularly in terms of intergenerational and socioeconomic equity – is a central theme in public debates on pension reform and a key dimension of legitimacy (Kohli, 2008). Reforms which are perceived to worsen inequalities may not be politically feasible (see Goris, Gijsbert, 2024, p. 17). Socioeconomic status, job strain, and labour market conditions all shape how individuals experience pension reforms. Structural inequalities in life expectancy, employment history, and health conditions mean that a uniform increase in retirement age can have unequal effects (Ebbinghaus, 2006; Sánchez-Romero et al., 2024). For example, older workers in physically demanding jobs often

face health-related constraints that make later retirement unrealistic. Addressing these disparities may require differentiated exit pathways. One approach which has been taken by countries such as the Netherlands and Italy is the use of early-retirement options for specific categories of workers such as those in physically demanding occupations as discussed above. These compensatory measures were not introduced at the same time as reforms raising the retirement age but were a reaction to it. Germany provides an example of country which simultaneously to the passing of a law raising the retirement age opened up a new early-retirement path for workers with long contribution history (which was later expanded).

Beyond formula design, the political context in which adjustments are implemented matters greatly. Abrupt or discretionary changes – particularly when implemented under external pressure – can lead to public contestation, especially if they lack transparent justification or buffering measures. This was evident in countries such as Greece and Portugal, where pension reforms adopted during the crisis were widely perceived as externally imposed and contributed to social discontent due to their far-reaching social impact (Theodoropoulou, 2015).

Timing and pace of implementation of reforms linking retirement age and life expectancy can also contribute to their political success. Long transition periods serve to spread political costs and reduce immediate resistance (Natali, 2009; Schludi, 2005). In addition, they may provide time for institutional and behavioural adaptation, although this depends on broader governance structures and communication strategies. Denmark provides an example of a country which managed to pass a discretionary rise in the retirement age followed by its linking to life expectancy with broad parliamentary support and little backlash partly by pushing the implementation of the reform far into the future and leaving anyone older than 47 unscathed by it (von Nordheim and Kvist, 2022, p. 96). Yet as more cohorts are now affected by the consequences of the reform the implementation date approached, social tensions resurfaced, amongst other things due to concerns about its impact on workers in strenuous occupations (von Nordheim and Kvist, 2022). The Danish case reveals both the advantages and limits of gradualism: while initial depoliticization may succeed, sustained political effort is required to manage downstream effects.



In summary, the technical implementation of pension reforms that tie retirement age to life expectancy hinges on a delicate balance between economic rationality and political acceptability. Automatic mechanisms can help stabilize pension systems, but they are not self-executing. Their success can amongst other things depend on the recognition of structural inequalities and the inclusion of compensatory measures for vulnerable groups. Strategic sequencing - through long transition periods and phased implementation - further enhances societal adaptability. Taken together, these elements constitute the foundations for reforms that are not only financially sound but also democratically legitimate and socially resilient.

## 4.3. After the reform: path dependencies, feedback effects, and the limits of depoliticization

While the previous section focused on the technical design and political acceptance of pension reforms that link retirement age to life expectancy, this chapter shifts the analytical lens to the challenges that arise after such reforms have been implemented. Even carefully institutionalized automatic mechanisms are not immune to political conflict, social contestation, or the need for ongoing recalibration. Understanding these dynamics requires attention to institutional path dependencies,

feedback effects, and the shifting arenas of political contestation that emerge once reforms move from legislation to lived reality.

The policy challenges that arise following the implementation of pension reforms are shaped by various factors that make it difficult to adjust, reverse, or adapt these policies to new circumstances. One of the primary obstacles is path dependency, which refers to the difficulty of changing policies once they have been institutionalized. As Ebbinghaus and Möhring (2022) highlight, pension reforms are often deeply embedded within political and institutional structures, creating expectations that influence the behaviour of policymakers, interest groups, and the public. A critical feature of modern pension reforms has been the introduction of automatic linkage mechanisms - particularly the coupling of retirement age to life expectancy - which create institutional rigidities designed to ensure long-term sustainability. These mechanisms aim to depoliticize pension adjustments by replacing discretionary political decisions with formula-based rules. However, rather than eliminating politics from pension systems, these automatic mechanisms often merely shift political conflicts to different arenas.

This shift in the location and nature of political conflict has been well documented in the literature. While automatic mechanisms may formally remove decisions from the political sphere, underlying conflicts often re-emerge through technical debates, implementation struggles, or distributive concerns. This institutional rigidity reflects a fundamental tension in pension reform: while automatic adjustment mechanisms are often promoted for their long-term contribution to fiscal sustainability, they tend to generate considerable political costs in the short term. At the time of implementation, such reforms may be perceived as a loss of democratic control over key distributional decisions, which can provoke resistance from voters and organized interests. Over time, however, their automatic nature could reduce the need for repeated political intervention, potentially limiting the system's exposure to partisan contestation and short-term policy shifts. Still, institutionalization does not necessarily eliminate political conflict. As Pierson (1994, pp. 18–20, 177–179) argues, the high political costs of visible benefit retrenchment often lead policym–akers to adopt indirect and incremental strategies - such as delaying implementation, targeting specific groups, or embedding changes in complex formulas. He refers to this logic as the "politics of retrenchment," in which reform is pursued through fragmentation and obfuscation rather than open confrontation. Similarly, Weaver (2011) emphasizes that political actors frequently seek to avoid blame by deflecting responsibility and minimizing the visibility of unpopular decisions. Bonoli (2012, pp. 93–94) supports this interpretation, showing that many entitlement-reducing reforms across OECD countries have been adopted through obscure benefit formula changes, long phase-in periods, and selective targeting. These techniques may help governments avoid concentrated opposition and maintain electoral support, although they often raise concerns about transparency and democratic accountability. This strategic, incremental approach to reform also reflects the sequencing logic of institutional change in Bismarckian welfare states. As Bonoli and Palier (2007) argue, past reforms can open new opportunities for further restructuring by altering institutional legacies, reshaping actor coalitions, or exposing implementation gaps that require adjustment. Especially in pension policy, earlier reforms - such as parametric changes or the introduction of automatic mechanisms - may create new pressures or policy contradictions that lead to additional rounds of reform. This dynamic highlights the importance of understanding pension reforms not as isolated events, but as part of evolving trajectories shaped by both institutional path dependency and adaptive political strategies. Taken together, these insights suggest that automation and institutional consolidation may not depoliticize pension reform entirely, but rather shift political conflict into less visible, technical arenas. The appeal of automatic mechanisms could thus lie less in their neutrality than in their ability to reduce the frequency and visibility of politically costly

decisions. This might help explain why governments continue to favor such instruments, despite their limited transparency and potentially uneven distributive effects.

One concrete expression of this shift into technical arenas is the increasing reliance on complex adjustment formulas. While intended to enhance fiscal predictability and reduce the need for discretionary intervention, these formulas may introduce new challenges - particularly in terms of transparency and adaptability. Automatic linkage mechanisms often rely on technically intricate calculations that are difficult for both policymakers and the public to fully understand. When the logic and implications of such mechanisms are not clearly communicated, this can reduce public trust and limit the political system's ability to respond to changing social or economic conditions. As Bonoli (2012) notes, many entitlement-reducing reforms across OECD countries have been implemented through obscure adjustments and long phase-in periods to avoid concentrated resistance. One possible manifestation of this logic is the use of complex formulas that, while appearing neutral, effectively reduce the visibility of policy change. In the short term, this strategy may help insulate reforms from political backlash. Over time, however, it may undermine legitimacy and complicate recalibration – particularly if assumptions underlying the formula prove inaccurate or socially contentious. Even technically robust mechanisms may therefore require sustained political attention to remain credible, transparent, and fair.

Beyond these technical challenges, path dependency in pension policy may also generate new political tensions even after reforms have been established. As Weaver (2011) suggests, once a reform is institutionalized, it does not guarantee that political dynamics will remain stable. On the contrary, new demands or grievances can surface, requiring adjustments to the original policy framework. Furthermore, pension policies can create intergenerational contracts that, once established, become resistant to change. Individuals make life-course planning decisions based on these policies, investing in education, careers, and savings with specific retirement timelines in mind (Kohli, 2007). Research by Fernández and Jaime-Castillo (2013) demonstrates that such anticipatory behaviours create powerful feedback effects that reinforce existing policy directions and increase the political costs of deviation.



While behavioural expectations and institutional commitments can reinforce existing policy trajectories, another form of rigidity may arise from within the adjustment mechanisms themselves. When demographic projections are embedded into pension formulas, they effectively lock in assumptions about future developments – assumptions that may prove inaccurate, outdated, or politically contested over time. Such mechanisms are often framed as neutral and technocratic, but again, as Bonoli (2012) notes, opaque formulas and delayed implementation are frequently used as strategies to reduce political resistance to entitlement retrenchment. Similarly, Streeck and Thelen (2005) argue, institutional change can emerge gradually and less visibly, for instance by reallocating decision-making authority to new actors or arenas. In this context, it could be assumed that political decisions are not eliminated but rather displaced into technocratic or administrative domains, where contestation becomes less direct. This type of depoliticization may entrench contested policy arrangements by removing them from democratic deliberation and insulating them from revision. As they write, "The displacement of political conflict from one arena to another – say, from the legislature to regulatory agencies, or from open contestation to procedural interpretation – is itself a form of institutional change that may go unnoticed. Such moves often serve to stabilize contested arrangements by placing them beyond the reach of normal political revision" (Streeck and Thelen, 2005, p. 24). In this sense, depoliticization through automatic adjustment formulas does not necessarily neutralize political conflict. Instead, it

may transform it into a form of institutional path dependency, reinforcing policy commitments through mechanisms that are difficult to revise – even when demographic or economic assumptions evolve.

Examples from Denmark, Italy, Austria, and the Netherlands illustrate how pension systems adjust to political and social debates even after automatic or institutionalized rules have been introduced. In Denmark, where the statutory retirement age has been linked to life expectancy since 2006, additional schemes such as Seniorpension and Tidlig Pension were introduced to accommodate workers with long insurance histories and health limitations (von Nordheim and Kvist, 2023). In Italy, following the implementation of the Fornero reform, successive governments introduced flexible early retirement schemes such as Quota 100, 102, and 103, along with specific exit paths for occupations with high physical or psychological demands – including nurses, sanitation workers, night-shift staff, and kindergarten teachers (Casale, 2020; OECD, 2021; Jessoula and Raitano, 2019). These targeted measures reflected growing political pressure to address disparities in workability and longevity, and can be seen as part of a broader pattern of reactive policy learning under fiscal and political strain (Sacchi, 2018). These developments also reflect a deeper structural problem: as Whiteside (2017) notes, the flexibilization of the labour market and the increase in precarious employment have long undermined the ability of employees – particularly in the lower income groups – to collect continuous contribution records. This undermines the legitimacy of uniform pension age increases and reinforces the political demand for differentiated exit options.



In the Netherlands, the 2019 recalibration of the adjustment formula – reducing the pace of increases and temporarily freezing the retirement age – was complemented by sectoral early retirement options negotiated via collective agreements, especially for workers in physically demanding jobs (Danforth et al., 2019). These adaptations reflect the continued salience of distributional concerns, even under automatic adjustment logic, and illustrate the broader shift in Dutch welfare governance from consensus-based coordination to more segmented, executive-led strategies (van Gerven, 2019).

Austria further illustrates the institutional adaptation of pension systems. Following the 2004 harmonization reform, special provisions such as the Hacklerregelung and the Schwerarbeiterpension remained politically salient and contested. Recurrent debates focused on eligibility definitions, particularly around physically demanding occupations (Fink, 2013; Schmidthuber et al., 2016). These examples show that even institutionalized adjustment mechanisms may give rise to new social tensions, especially when they affect groups with unequal life expectancy or limited workability in later life.

While automatic adjustment rules can reduce the frequency of discretionary political interventions, they do not eliminate the need to consider the interests and concerns of affected groups. The long-term success of such reforms depends not only on their technical soundness, but also on institutional features that foster public trust and legitimacy (Barr and Diamond, 2009). According to Brezzi et al. (2021), trust in public institutions is built on five core dimensions: integrity, openness, responsiveness, fairness, and reliability. Drawing on the findings discussed in Chapter 4, and in light of these broader trust dimensions, the following design features (see Table 1) appear particularly relevant for automatic adjustment mechanisms in pension policy.

By incorporating these elements, pension reforms can contribute to maintain their long-term sustainability while also preserving the political legitimacy and public trust necessary for their continued operation. The challenge is not simply to depoliticize pension adjustments but to create

institutional frameworks that channel political discourse toward constructive adaptation rather than systematic resistance or reversal.

| Design feature | Relevance for legitimate reforms | Selected sources |
|---|---|---|
| Transparent and comprehensible adjustment formulas | Facilitates understanding and predictability of adjustments, fostering trust and acceptance | Bosworth and Weaver (2011), Ritola and Väänänen (2023), Finnish Centre for Pensions (2025) |
| Equity-oriented provisions to address social inequality | Prevents unequal burdens resulting from differences in life expectancy and work capacity | Arza and Kohli (2008), Kohli (2008), Sánchez-Romero et al. (2024) |
| Institutionalized review and recalibration mechanisms | Enables adjustments to changing conditions without undermining the logic of automaticity | von Nordheim and Kvist (2022), Weaver (2011) |
| Complementary labour market measures | Supports extended working lives and reduces involuntary early retirement due to health constraints | Schmidhuber et al. (2016), Hemerijck and Huguenot-Noël (2020), Goris and Gijsbert (2024), Theodoropoulou (2015), Natali and Terlizzi, 2022 |
| Protective provisions and minimum guarantees | Shields vulnerable groups from adverse effects related to shorter life expectancy or limited employability | OECD (2021), Jessoula and Raitano (2019), OECD (2021), Natili and Jessoula (2025) |



## 4.4. Depoliticization reconsidered: politics, power and adjustment formulas

This chapter takes a step back from the empirical evidence presented earlier and examines the political logic, normative assumptions, and structural limitations of automatic pension age adjustment mechanisms. While they are often framed as neutral instruments designed to reduce politicization, their design, operation, and public perception remain deeply political. Rather than asking whether these mechanisms succeed, this section asks how and why they are used, and what is lost or displaced in the process.

Automatic links between retirement age and life expectancy are often presented as technocratic responses to demographic ageing and fiscal strain. They promise a rational, rules-based approach to pension adjustment that can shield policymakers from short-term political costs. In this context, they appear as institutional solutions to problems of electoral volatility, partisan conflict, and blame avoidance (Weaver, 1986; Pierson, 1994; Bonoli, 2012). However, as Bonoli (2012) and Streeck and Thelen (2005) argue, such mechanisms rarely eliminate political conflict. Instead, they shift it to other arenas – such as actuarial design, implementation practices, or judicial interpretation – where it becomes less visible but no less consequential. This displacement is not politically neutral. By embedding distributional decisions in technical formulas, automatic mechanisms obscure normative choices about intergenerational equity, social justice, and the role of the state. They translate contested political questions – such as who should bear the burden of demographic change – into seemingly objective indicators.

Moreover, the design of automatic adjustment formulas is itself a political act. Decisions about base years, longevity measures, smoothing techniques, and transition periods reflect value judgments and distributional preferences (Bosworth and Weaver, 2011; Grech, 2017). For instance, as seen

in Chapter 4.2, Finland's smoothing mechanism and transparent communication practices differ markedly from the more abrupt or opaque designs implemented elsewhere. These choices influence not only outcomes but also legitimacy and trust. As demonstrated in Chapters 4.2 and 4.3, automatic mechanisms are frequently recalibrated or supplemented with exceptions. Early retirement options for workers in physically demanding jobs, the freezing or revision of adjustment formulas, and targeted exemptions all reflect continued political sensitivity. These responses are not failures of automation, but indicators of its limits. Recalibration – as a form of institutional adaptation – reveals that automaticity does not end political negotiation, but rather restructures it around new institutional logics and actor constellations (Bonoli and Palier, 2007).

Importantly, the long-term viability of automatic mechanisms depends not only on their technical soundness but also on their embeddedness within broader institutional and political contexts. Countries with strong traditions of social dialogue tend to generate more sustainable outcomes, as inclusive governance allows for adjustment without eroding legitimacy. In contrast, top-down implementations lacking consultation, as seen in Italy during the Fornero reform, are more likely to provoke backlash and policy reversals (Natili and Jessoula, 2025; Duchemin and Weber, 2013). A balanced assessment of automatic pension adjustment mechanisms must therefore go beyond their fiscal and strategic appeal. While they may reduce visible contestation and improve long-term predictability, they also risk obscuring fundamental normative debates and weakening democratic control. Designing sustainable pension systems thus requires not only technical sophistication but also institutional mechanisms that preserve accountability, transparency, and responsiveness to evolving social needs.



Taken together, the preceding analysis shows that automatic adjustment mechanisms are neither purely technical instruments nor neutral responses to demographic change. They are deeply embedded in institutional contexts, shaped by political strategies, and contested through their distributive effects. While they may help insulate pension policy from short-term pressures, they also risk displacing political responsibility, narrowing democratic debate, and reinforcing existing inequalities. Sustainable pension reform therefore requires more than institutional automation – it demands inclusive governance structures, continuous political engagement, and a normative commitment to fairness across social and generational lines.

## 5. Conclusion

Population ageing caused by stagnating fertility rates and rising life expectancies has been accompanying many regions worldwide and, as a result of baby booms occurring following the end of the Second World War, is expected to accelerate in some countries. In the context of lower-than-expected growth following the Great Financial Crisis and the resulting rise in public debt, the discussion around the economic consequences, especially for economic growth, of population ageing has intensified. Despite the ongoing debates for example around the counteracting role of automation and some international evidence from the recent decades casting doubt on the existence of a significant relationship between population ageing and growth, many studies expect that ageing will affect the economy negatively.

While the impact of demographic change on the economy as a whole may not be straightforward, its expected consequences for pay-as-you-go pension systems are more tractable: In the absence of changes to employment rates and retirement behaviour, the ratio of pensioners to workers will

increase. This will necessitate a combination of reactions such as a rise in contribution rates or tax subsidies or a reduction of benefits to keep expenditure and revenues in balance.

In the recent decades raising the standard retirement age has been one of the preferred alternatives to address the rising cost of public pension systems. While many countries have chosen discretionary adjustments, a growing number have decided to couple the standard retirement age to life expectancy to ensure (semi-)automatic adjustments of the former in the face of expected improvements of the latter. In this report we have tried to shed some light on the economic and political aspects of such policy measures and describe the societal context, which, if not addressed, can pose a challenge to their success.

From an economic perspective increasing the retirement age as a response to rising life expectancy is suggested by some to be a more appropriate response than alternative policies such as increasing social security contribution rates (or taxes) or reducing pension levels. These alternatives are thought to have negative labour market impacts or could adversely affect pension adequacy, respectively, whereas increasing the standard retirement age could ideally avoid these pitfalls by resulting in longer working lives, and thus a higher tax base and lower costs for the pension systems. Following this line of argument linking the retirement age to life expectancy appears as a natural approach to reducing fiscal pressures on the pension system (and public finances) in the long run.

Indeed, there is international evidence that increasing the standard retirement age can result in the prolonging of working lives. However, the behavioural responses can vary significantly between different countries and, as we have argued, the economic consequences of changes in the retirement age can depend on the institutional context, especially the structural features of the pension system under consideration. For example, both the response to policies raising the retirement age and their dampening effect on pension expenditure can depend on the strength of the relationship between contributions and benefits: while the positive fiscal impact of longer working lives in Beveridge-type pension systems, in which entitlements or the pension level do not significantly rise is clear, longer working lives in Bismarck-type pensions, in which a longer contribution period creates new pension entitlements and results in higher individual pension levels is less straightforward.



From a political perspective, automatic adjustment mechanisms in general and policies linking the retirement age to life expectancy in particular, are thought to provide opportunities for easier implementation of painful measures and for ensuring their sustainability: after such automatic adjustment mechanisms are in place, politicians may be able to minimize their own responsibility and avoid blame in the future when the mechanisms are activated. Moreover, they may have the potential to depoliticize debates around aspects of pension policy which could make them less prone to the vicissitudes of the election cycle. In the case of mechanisms linking the retirement age to life expectancy the determination of the retirement age using a demographic indicator according to a predetermined formula may also reduce the perception of arbitrariness and make communication of the measure easier. However, these mechanisms raise important questions regarding democratic legitimacy and social justice. By shifting decision-making from elected representatives to automatic formulas, there is a risk of reducing democratic accountability and public deliberation on crucial welfare state policies.

Even though the existing evidence from countries which have passed reforms linking retirement ages to life expectancy does not suffice for general statements regarding the long-term political success of such laws, the experience of these countries suggests that such reforms are not immune to the pitfalls facing other contentious pension reforms: the link between retirement age and life expectancy can be suspended (as in Slovakia), complemented with (temporary) early-retirement

pathways which could counteract its effects (as in e.g. Italy), renegotiated with social partners with changes to its design (as in the Netherlands). These adjustments often reflect attempts to address the equity concerns and democratic pushback that emerge when economic objectives confront complex social and political realities.

Disregarding existing inequalities can pose a challenge to the economic and political success of measures linking the retirement age to life expectancy both in the short and the long run. The economic success of the policy measure depends to a significant extent on the degree to which it will result in the extension of working lives. However, some may not be able to work longer, due for example to health reasons or worse employment chances and depending on the strictness of access to disability pensions and their adequacy may thus be forced to retire early with higher deductions as a result of rising statutory retirement ages. At the same time, individuals who are forced to take up unemployment, disability or sickness benefits will result in higher costs in other welfare state institutions and reduce the net fiscal impact of policy measures raising retirement ages. Moreover, the risks of not being able to extend working lives do not seem to be randomly distributed between different socio-economic groups, which may be deemed unfair and pose a challenge to the implementation and the sustainability of the policy measure.

Another concern, which accompanies any fixed statutory retirement age and which can be exacerbated by linking it to life expectancy is caused by differences in mortality rates between different socioeconomic groups and their widening. While any statutory retirement age and benefit calculation rule depending on it (e.g. through computation of early-retirement deductions) disadvantages groups with subaverage life expectancies, linking the retirement age to life expectancy measures computed by observing mortality in the whole population can further deepen inequalities. This can happen for example if the life expectancy gains are mostly driven by improvements in mortality conditions of groups with higher income and educational attainment. In such a situation a link between retirement age and life expectancy may mean shorter time spent in retirement for groups which have not benefitted from mortality improvements. Again, the non-random nature of the distribution of risk of having a shorter lifespan poses a fairness-issue and a challenge to policy measures linking retirement age to life expectancy.



A natural and at the same time difficult approach to confronting these challenges is by identifying the causes for differential mortality according to socio-economic status and taking measures to address them. Despite the consensus regarding the correlation between life expectancy and the socio-economic status, its strength can vary from country to country and can depend on the chosen proxies for socio-economic status. Furthermore, in the literature there are multiple attempts at the explanation of this correlation (differential access to healthcare, working conditions, etc.) with varying degrees of relevance for different countries. Another difficulty in addressing causes of differential mortality is that it may take a long time to bear fruit.

Partly due to the above-mentioned difficulties compensatory measures appear as indispensable tools to accompany policies linking the retirement age to life expectancy (or more generally rising it). Examples are measures which would try to compensate for disadvantages by changing the calculation of contributions or benefits. Another widely used approach (with possible implications for benefit calculations) is to loosen eligibility conditions for deduction-free pensions e.g. by opening or strengthening new early-retirement paths or making conditions for access to disability pensions less strict. While the introduction of such compensatory measures to accompany rises in the retirement age may be a political necessity, they also have certain drawbacks: on the one hand the definition

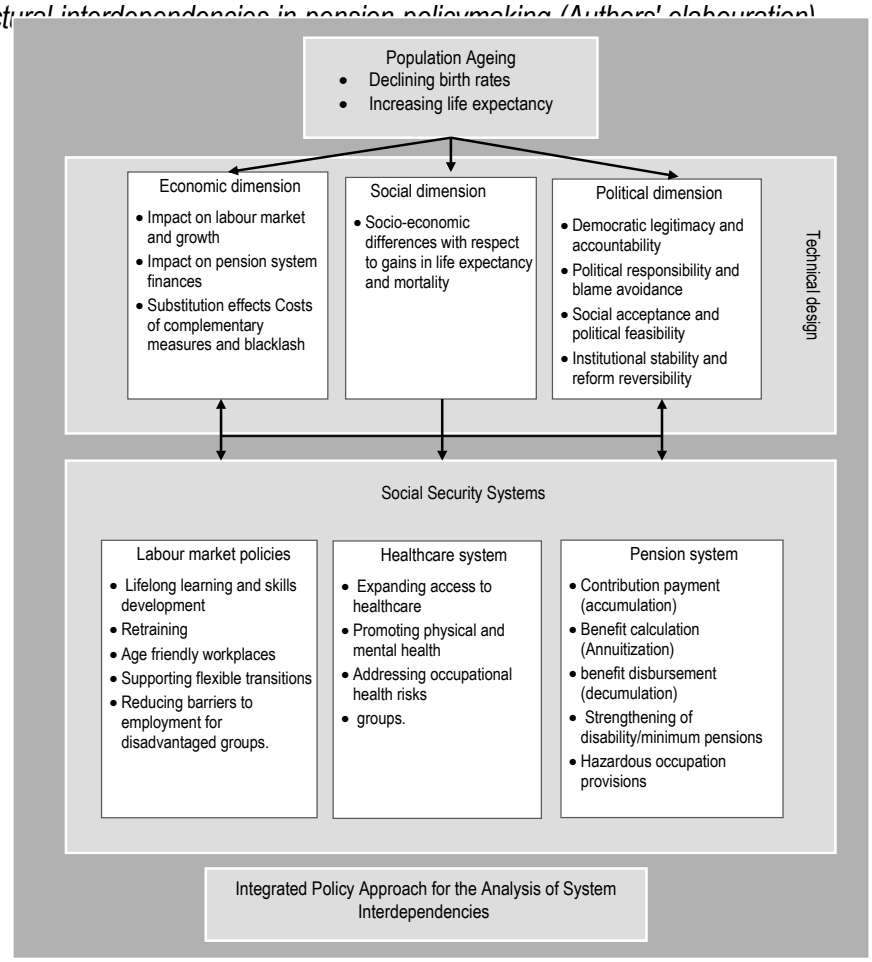
of disadvantaged groups which will benefit from such measures is often not free from a degree of arbitrariness. On the other hand, their introduction can counteract some of the fiscal consequences of rising statutory retirement ages.

Finally, introducing policy measures that link the retirement age to life expectancy involves several key choices, such as the strength of the link, the frequency of retirement age revisions, how far in advance new retirement ages are communicated, the extent to which life expectancy fluctuations are considered, and whether retirement age reductions are possible. Besides their economic significance, these choices provide flexibility in designing such policy measures and could help ensure long-term sustainability.

Figure 1 underscores that pension reforms cannot be developed or implemented in isolation from their broader context. Rather, they are situated at the intersection of demographic pressures, fiscal constraints, labour market dynamics, social inequalities, and politics. Economic considerations such as public finance and productivity development interact closely with social factors like disparities in life expectancy and occupational demands, while political dynamics, including actor constellations and public support, critically influence the scope for reform. Furthermore, our analysis emphasizes the role of interconnected policy fields – such as healthcare systems and labour market policies – in shaping the conditions for successful and equitable pension reforms. Addressing disparities in health, employment trajectories, and life expectancy requires coordinated policy interventions across multiple fields. This systemic perspective highlights the necessity of a policy approach that considers not only financial and demographic imperatives but also social justice concerns and democratic legitimacy.



**Figure 1.** *Structural interdependencies in pension policymaking (Authors' elaboration)*



## Bibliography

**Aaron, H. J.; Reischauer, R. D.** 1998. *Countdown to reform: the great social security debate*. Century Foundation Press.

**Acemoglu, D.; Restrepo, P.** 2017. "Secular stagnation? The effect of aging on economic growth in the age of automation", in *American Economic Review*, Vol. 107, No. 5, 174–79.

**Aksoy, Y. et al.** 2019. "Demographic structure and macroeconomic trends", in *American Economic Journal: Macroeconomics*, Vol. 11, No. 1.

**Alvarez, J.A.; Kallestrup-Lamb, M.; Kjærgaard, S.** 2021. "Linking retirement age to life expectancy does not lessen the demographic implications of unequal lifespans", in *Insurance: Mathematics and Economics*, Vol. 99.

**Ardito, C.; Costa, G.** 2022. "Could a fairer retirement age mitigate health inequalities? Evidence and decision-making", in *Frontiers in Public Health*, Vol. 10.

**Arza, C.; Kohli, M. (eds).** 2008a. *Pension reform in Europe: Politics, policies and outcomes*. Abingdon-on-Thames, Routledge.

**Arza, C.; Kohli, M.** 2008b. "Introduction: the political economy of pension reform", in *Pension reform in Europe: Politics, policies and outcomes*. Abingdon-on-Thames, Routledge.



**Aspegren, H.; Durán, J.; Masselink, M.** 2019. *Pension reform in Sweden: Sustainability & adequacy of public pensions* (European Economy Economic Brief, No. 48). Brussels, European Commission, Directorate-General for Economic and Financial Affairs.

**Atav, T.; Jongen, E. L.; Rabaté, S.** 2019. *The effects of the increase in the retirement age in the Netherlands* (Discussion Paper). The Hague, CPB Netherlands Bureau for Economic Policy Analysis.

**Ayuso, M.; Bravo, J. M.; Holzmann, R.** 2016. *On the heterogeneity of longevity among socio-economic groups: Scope, Trends and implications for earnings-related pension program*s (IZA Discussion Paper, No. 10060). Bonn, IZA Institute of Labour Economics.

**Ayuso, M.; Bravo, J. M.; Holzmann, R.** 2017. "Addressing longevity heterogeneity in pension scheme design and reform", in *Journal of Finance and Economics*, Vol. 6, No. 10.

**Balaj, M. et al.** 2024. "Effects of education on adult mortality: A global systematic review and meta-analysis", in *Lancet Public Health*, Vol. 9, No. 3.

**Bambra, C.** 2011. "Health inequalities and welfare state regimes: Theoretical insights on a public health 'puzzle'", in *Journal of Epidemiology and Community Health*, Vol. 65, No. 9.

**Bargain, O.; Orsini, K.; Peichl, A.** 2014. "Comparing labour supply elasticities in Europe and the United States: New results", in *The Journal of Human Resources*, Vol. 49, No. 3.

**Barr, N.** 2002. "Reforming pensions: Myths, truths, and policy choices", in *International Social Security Review*, Vol. 55, No. 2.

**Barr, N.; Diamond, P.** 2009. "Reforming pensions: Principles, analytical errors and policy directions", in *International Social Security Review*, Vol. 62, No.2.

**Barrett, M.** 2024. "Danish PM wants to rethink planned changes to retirement age", in *The Local Denmark*, 14 August.

**Bergqvist, K.; Yngwe, M. A.; Lundberg, O.** 2013. "Understanding the role of welfare state characteristics for health and inequalities: An analytical review", in *BMC Public Health*, Vol. 13, No. 1.

**Bonoli, G**. 2012. "Blame avoidance and credit claiming revisited", in G. Bonoli and D. Natali (eds), *The politics of the new welfare state*. Oxford University Press.

**Bonoli, G.; Palier, B.** 2007. "When past reforms open new opportunities: comparing old-age insurance reforms in Bismarckian welfare systems", in *Social Policy and Administration*, Vol. 41, No. 6.

**Bohacek, R. et al.** 2015. "The educational gradient in life expectancy in Europe: preliminary evidence from SHARE, in A. Börsch-Supan et al. (eds), *Ageing in Europe – Supporting policies for an inclusive society*. Berlin, De Gruyter.

**Börsch-Supan, A.** 2007. ***Über Selbststabilisierende Rentensysteme*** (Discussion Paper, No. 133). Mannheim, Mannheim Research Institute for the Economics of Aging.

**Bosworth, B.; Weaver, C.** 2011. *Social security on auto-pilot: International experience with automatic stabilizer mechanisms* (CRR WP, No. 2011-18). Chestnut Hill, MA, Center for Retirement Research at Boston College.

**Bravo, J. M. et al.** 2021. "Intergenerational actuarial fairness when longevity increases: Amending the retirement age", in *Insurance: Mathematics and Economics*, Vol. 113.

**Brezzi, M. et al.** 2021. *An updated OECD framework on drivers of trust in public institutions to meet current and future challenges* (OECD Working Papers on Public Governance, No. 48). Paris, Organisation for Economic Co-operation and Development.

**Brønnum-Hansen, H.; Baadsgaard, M.** 2012. "Widening social inequality in life expectancy in Denmark. A register-based study on social composition and mortality trends for the Danish population", in *BMC Public Health*, Vol. 12, No. 1.

**Brumm, N.; Römer, M.** 2019. "Gibt es einen Zusammenhang von Entgeltpunkten und Lebenserwartung? Anmerkungen zur differentiellen Sterblichkeit", in *RV aktuell*, No. 3.

**Burkhauser, R. V.; Turner, J. A.** 1985. "Is the social security payroll tax a tax?", in *Public Finance Quarterly*, Vol. 13, No. 3.

**Buslei, H.et al.** 2024. „Rente nach 45 Jahren: Auch Personen mit geringer Arbeitsbelastung gehen frühzeitig abschlagsfrei in Ruhestand", in *DIW-Wochenbericht*, No. 48, 760–765.

**Casale, D.** 2020. "Early retirement in the Italian social security system: Some critical insights", in *Italian Labour Law E-Journal*, Vol. 13, No. 1.

**Case, A. C.; Deaton, A.** 2003. *Broken down by work and sex: How our health declines* (NBER Working Paper, No. 9821). Cambridge, MA, National Bureau of Economic Research.

**Chang, M.H.et al.** 2008. "Differences in healthy life expectancy for the US population by sex, race/ethnicity and geographic region", in *Journal of Public Health*, Vol. 37, No. 3.

**Chetty, R. et al.** 2016. "The association between income and life expectancy in the United States, 2001-2014", in *JAMA*, Vol. 315, No. 16.

**Clauwaert, S.** 2013. *The country-specific recommendations (CSRs) in the social field: an overview and initial comparison* (Background analysis). Brussels, European Trade Union Institute.

**Cutler, D.M.; Lleras-Muney, A.** 2006. *Education and health: Evaluating theories and evidence* (NBER Working Paper, No. 12352). Cambridge, MA, National Bureau of Economic Research.

**Danforth, B.; Jankowski, J.; Rajnes, D.** 2019. "Netherlands slows scheduled retirement age increases", in *International Update*, July.

**Deeg, D.J.H.; De Tavernier, W.; de Breij, S.** 2021. "Occupation-based life expectancy: Actuarial fairness in determining statutory retirement age", in *Frontiers in Sociology*, Vol. 6.

**Diakite, K.; Devolder, P.** 2021. "Progressive pension formula and life expectancy heterogeneity", in *Risks*, Vol. 9, No. 7.

**Dolls, M.; Krolage, C.** 2023. "'Earned, not given'? The effect of lowering the full retirement age on retirement decisions", in *Journal of Public Economics*, Vol. 223

**Duchemin, C.; Weber, T.** 2013. *Social partners' involvement in pension reform in the EU*. Dublin, European Foundation for the Improvement of Living and Working Conditions.

**Dudel, C. et al.** 2023. "The extension of late working life in Germany: trends, inequalities, and the East-West divide", in *Demography*, Vol. 60, No. 4.

**Ebbinghaus, B.** 2006. *Reforming early retirement in Europe, Japan and the USA*. Oxford, Oxford University Press.

**Ebbinghaus, B.; Möhring, K.** 2022. "Studying the politics of pension reforms and their social consequences", in K. Nelson, R. Nieuwenhuis and M. A. Yerkes (eds), *Social policy in changing European societies: Research agendas for the 21st century.* Cheltenham, Elgar.

**Ebeling, M. et al.** 2023. "Occupational differences in mortality and life expectancy persist after retirement and throughout life", in *Scandinavian Journal of Public Health*, Vol. 51, No. 6.

**Eikemo, T.A. et al.** 2008. "Welfare state regimes and income-related health inequalities: a comparison of 23 European countries", in *European Journal of Public Health*, Vol. 18, No. 6.

**Eliason, M.; Storrie, D.** 2009. "Does job loss shorten life?", in *The Journal of Human Resources*, Vol. 44, No. 2.

**Espelt, A. et al.** 2008. "Inequalities in health by social class dimensions in European countries of different political traditions", in *International Journal of Epidemiology*, Vol. 37, No. 5.

**European Commission.** 2012. *Opinion of the European Economic and Social Committee on the* White paper: An agenda for adequate, safe and sustainable pensions (COM (2012) 55 final). Brussels.

**European Commission**. 2021. *Analysis of the recovery and resilience plan of Slovakia. Accompanying the document. Proposal for a council implementing decision. On the approval of the assessment of the recovery and resilience plan for Slovakia* (COM (2021) 339 final). Brussels.

**Feinstein, J. S.** 1993. "The relationship between socioeconomic status and health: A review of the literature", in *Milbank Quarterly*, Vol. 71, No. 2.

**Fernández, J. J.; Jaime-Castillo, A. M.** 2013. "Positive or negative policy feedbacks? Explaining popular attitudes towards pragmatic pension policy reforms", in *European Sociological Review*, Vol. 29, No. 4.

**Fink, M.** 2013. *Pensions, health and long-term care – Country document: Austria*. Brussels, European Commission – Analytical Support on Social Protection Reforms.

**Fletcher, J. M.; Sindelar, J. L.** 2009. *Estimating causal effects of early occupational choice on later health: Evidence using the PSID* (NBER Working Paper, No. 15256). Cambridge, MA, National Bureau of Economic Research.

**Fornero, E.** 2020. "La réforme italienne des retraites: ombres et lumières d'un parcours d'obstacles", in *Revue de l'OFCE*, Vol 170, No. 6.

**Fouejieu, A.; Kangur, A.; Martinez, S. R.; Soto, M.** 2021. *Pension reforms in Europe: how far have we come and gone?* (Departmental Paper, No. 16). Washington, DC, International Monetary Fund.

**Frommert, D. et al.** 2009. „Pension systems and the challenge of population ageing – What does the public think?" in R. Edmondson and H. J. Kondratowitz (eds), *Valuing older people – A humanist approach to ageing*. Bristol, Policy Press.

**Frommert, D. et al.** 2009. "Pension systems and the challenge of population ageing – What does the public think?", in R. Edmondson and H. J. Kondratowitz (eds), *Valuing older people: A humanist approach to ageing*. Bristol, Policy Press.



**Frova, L.et al.** 2024. "Unveiling social disparities in later life: Income's impact on mortality among the elderly in Italy", in *European Journal of Public Health*, Vol. 34, Suppl. 3.

**Gagnon, E.; Johannsen, B. K.; López-Salido, B. K.** 2021. "Understanding the new normal: the role of demographics", in *IMF Economic Review*, Vol. 69, No. 2.

**Gaudecker, H. M. von; Scholz, R.D.** 2006. *Lifetime earnings and life expectancy* (MPIDR Working Paper, No. 2006-008). Rostock, Max Planck Institute for Demographic Research.

**Gerven, M. van** 2019**.** "The Dutch participatory state: shift from a welfare system of collective solidarity towards individual responsibility in a participatory society", in S. Blum, J. Kuhlmann and K. Schubert (eds), *Handbook of European welfare systems.* Milton, Routledge.

**Geyer, J. et al.** 2020. "Labour market and distributional effects of an increase in the retirement age", in *Labour Economics*, Vol. 65.

**Goris, F.; Gijsbert, W.** 2024. *Influences of European policy coordination on national pension reforms* (WRR Working Paper, No. 62). The Hague, Netherlands Scientific Council for Government Policy.

**Grech**, **A. G.** 2017. "Comparing state pension reforms in EU countries before and after 2008", in *Journal of International and Comparative Social Policy*, Vol. 33, No. 3.

**Grech, A. G.** 2018. "What makes pension reforms sustainable?", in *Sustainability*, Vol. 10, No. 8.

**Grigoriev, O.; Doblhammer, G.** 2019. "Changing educational gradient in long-term care-free life expectancy among German men, 1997-2012", in *PLoS One*, Vol. 14, No. 9.

**Guardiancich, I.; Guidi, M.; Terlizzi, A.** 2022. "Beyond the European Semester: The supranational evaluation cycle for pensions", in *Journal of European Social Policy*, Vol. 32, No. 5.

**Haan, P.; Schaller, M.** 2021. *Heterogene Lebenserwartung: Forschungsprojekt im Auftrag des Sozial-verbands VdK Deutschland* (Politikberatung kompakt 171). Berlin, Deutsches Institut für Wirtschaftsforschung.

**Head, J. et al.** 2019. "Socioeconomic differences in healthy and disease-free life expectancy between ages 50 and 75: a multi-cohort study", in *European Journal of Public Health*, Vol. 29, No. 2.

**Helgesson M.et al.** 2019. "Healthy migrant effect in the Swedish context: A register-based, longitudinal cohort study", in *BMJ Open*, Vol. 9, No. 3.

**Hemerijck, A.; Huguenot-Noël.** 2020. "Just transition: The pensions analogy", in *Social Europe*, 5 February.

**Himmelreicher, R.K. et al.** 2008. "Die fernere Lebenserwartung von Rentnern und Pensionären im Vergleich", in *WSI-Mitteilungen*, Vol. 61, No. 5.

**Hinrichs, K.** 2021. "Recent pension reforms in Europe: More challenges, new directions: An overview", in *Social Policy and Administration*, Vol. 55, No. 3.

**Hofäcker, D.** 2015. "In line or at odds with active ageing policies? Exploring patterns of retirement preferences in Europe", in *Ageing and Society*, Vol. 35, No. 7.

**Hoffmann, R.; Kröger, H.; Pakpahan, E.** 2018. "Pathways between socioeconomic status and health: Does health selection or social causation dominate in Europe?", in *Advances in Life Course Research*, Vol. 36.

**Hummer, R.A.; Lariscy, J.T.** 2011. "Educational attainment and adult mortality", in R. G. Rogers and E. M. Crimmins (eds), *International handbook of adult mortality* (International Handbooks of Population, Vol. 2). Dordrecht, Springer.

**Huisman, M. et al.** 2004. "Socioeconomic inequalities in mortality among elderly people in 11 European populations", in *Journal of Epidemiology and Community Health*, Vol. 58, No. 6.

**Hwang, H.; Roehn, O.** 2022. *Tackling the challenges of population ageing in the Slovak Republic* (OECD Economics Department Working Paper, No. 1701). Paris, Organisation for Economic and Co-operation Development.

**Islam, N. et al.** 2021. "Effects of COVID-19 pandemic on life expectancy and premature mortality in 2020: time series analysis in 37 countries", in *The BMJ*, Vol. 375.

**Jessoula, M.** 2017. *The 2016 Italian pension reform and the issue of equity* (ESPN Flash Report, No. 2017/12). Brussels, European Commission.

**Karam, P. et al.** 2010. *Macroeconomic effects of public pension reforms* (IMF Working Paper, No. 10/297). Washington, DC, International Monetary Fund.

**Klein, T.; Unger, R.** 2001. "Einkommen, Gesundheit und Mortalität in Deutschland, Großbritannien und den USA", in *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, Vol. 53, No. 1.

**Kohli, M.** 2007. "The institutionalization of the life course: looking back to look ahead", in *Research in Human Development,* Vol. 4, No. 3-4.

**Kohli, M.** 2008. "Generational equity: Concepts and attitudes", in C. Arza and M. Kohli (eds), *Pension reform in Europe: Politics, policies and outcomes*. London, Routledge.

**Kröger, H.; Kroh, M.; Kroll, L.; Lampert, T.** 2017. "Einkommensunterschiede in der Mortalität in Deutschland: ein empirischer Erklärungsversuch", in *Zeitschrift für Soziologie*, Vol. 46, No. 2.

**Kroll, L.; Lampert, T.** 2009. " Soziale Unterschiede in der Lebenserwartung. Datenquellen in Deutschland und Analysemöglichkeiten des SOEP", in *Methoden – Daten – Analysen*, Vol. 3, No. 1.

**Lampert, T.; Hoebel, J.; Kroll, L.** 2019. "Soziale Unterschiede in der Mortalität und Lebenserwartung in Deutschland – Aktuelle Situation und Trends", in *Journal of Health Monitoring*, Vol. 4, No. 1.

**Lee, K.** 2024. "Varying effects of public pensions: pension spending and old-age Employment under different pension regimes", in *Journal of European Social Policy*, Vol. 34, No. 1.

**Li, Y. et al.** 2018. "The impact of healthy lifestyle factors on life expectancies in the US population", in *Circulation*, Vol. 138, No. 4.

**Liebman, J. B.; Luttmer, E. F. P.; Seif, D. G.** 2009. "Labour supply responses to marginal social security benefits: Evidence from discontinuities", in *Journal of Public Economics*, Vol. 93, No. 11.

**Liebman, J. B.; Luttmer, E. F. P.** 2015. "The perception of social security incentives for labour supply and retirement: The median voter knows more than you'd think", in *Tax Policy and the Economy*, Vol. 26, No. 1.

**Lundin, A. et al.** 2010. "Unemployment and mortality: A longitudinal prospective study on selection and causation in 49,321 Swedish middle-aged men", in *Journal of Epidemiology and Community Health*, Vol. 64, No. 1.

**Lijphart, A.** 2012. *Patterns of democracy: Government forms and performance in thirty-six countries*. New Haven, CT, Yale University Press.

**Lübker, C.; Murtin, F.** 2023. "Changes in longevity inequality by education among OECD countries before the COVID-19 pandemic", in *BMC Public Health*, Vol. 23, No. 1.

**Mackenbach, J. P.** 2020. "Re-thinking health inequalities", in *European Journal of Public Health*, Vol. 30, No. 4.

**Mackenbach, J. P. et al.** 2003. "Widening socioeconomic inequalities in mortality in six Western European countries", in *International Journal of Epidemiology*, Vol. 32, No. 5.

**Mackenbach, J. P. et al.** 2008. "Socioeconomic inequalities in health in 22 European countries", in *The New England Journal of Medicine*, Vol. 358, No. 23.

**Mackenbach, J.P et al.** 2015. "Trends in inequalities in premature mortality: a study of 3.2 million deaths in 13 European countries", in *Journal of Epidemiology and Community Health*, Vol. 69, No. 3.

**Mackenbach, J. P. et al.** 2017. "Determinants of the magnitude of socioeconomic inequalities in mortality: A study of 17 European countries", in *Health and Place*, Vol. 47.

**Majer, I. M. et al.** 2011. "Socioeconomic inequalities in life and health expectancies around official retirement age in 10 Western-European countries", in *Journal of Epidemiology and Community Health*, Vol. 65.

**Marmot, M.** 1994. "Social differentials in health within and between populations", in *Daedalus*, Vol. 123.

**Marmot, M.G. et al.** 1991. "Health inequalities among British civil servants: The Whitehall II study", in *Lancet*, Vol. 337, No. 8754.

**Meara, E.; Richards, S.; Cutler, D.** 2008. "The gap gets bigger: Changes in mortality and life expectancy by education, 1981−2000", in *Health Affairs*, Vol. 27, No. 2.

**Meneu, R. et al.** 2016. "Adjustment mechanisms and intergenerational actuarial neutrality in pension reforms", in *International Social Security Review*, Vol. 69, No. 1.

**Mosquera, I. et al.** 2019. "Socio-economic inequalities in life expectancy and health expectancy at age 50 and over in European countries: Insights for the debate on pension policies", in *Sozialer Fortschritt*, Vol. 68, No. 4.

**Moullan, Y.; Jusot, F.** 2014. "Why is the 'healthy immigrant effect' different between European countries?", in *European Journal of Public Health*, Vol. 24, Suppl. 1.

**Murtin, F. et al.** 2017 *Inequalities in longevity by education in OECD countries: Insights from new OECD estimates* (OECD Statistics Working Paper, No. 02). Paris, Organisation for Economic Co-operation and Development.

**Myers, R. J.** 1985. *Social security* (Third edition). Holmwood, IL, R.D. Irwin.



**Natali, D.** 2009. "Pension reforms in Italy and the US: Policy change through political and institutionalized policy 'gates'", in G. Capano and M. Howlett (eds), *European and North American policy change*. London, Routledge.

**Natali, D.; Rhodes, M.** 2008. "The New Politics of Pension Reforms in Continental Europe", in C. Arza, C. and M. Kohli (eds), *Pension reform in Europe: Politics, policies and outcomes*. Abingdon-on-Thames, Routledge.

**Natali, D.; Terlizzi, A.** 2022. *Minimum income across all ages: A focus on elderly people*. ETUI Working Paper No. 2022.17. Brussels, European Trade Union Institute (ETUI).

**Natili M; Jessoula M.** (2025). "Neoliberal reforms, Great Recession and political backlash: Parties, groups and voters in the new politics of welfare in Italy", in *Italian Political Science Review/Rivista Italiana di Scienza Politica*, Online, 21 January.

**Nordheim, F. von; Kvist, J.** 2022. "'Living longer, working longer': An unlikely retirement policy success?", in C. de la Porte et al. (eds), *Successful public policy in the Nordic Countries: Cases, lessons, challenges.* Oxford, Oxford University Press.

**Nordheim, F. von; Kvist, J.** 2023. "Regulating the retirement age – lessons from Nordic pension policy approaches", in *Regulation & Governance*, Vol. 17, No. 3.

**ONS.** 2023. *Period and cohort life expectancy explained.* London, Office for National Statistics.

**OECD.** 2021. *Pensions at a glance 2021: OECD and G20 indicators*. Paris, Organisation for Economic and Co-operation Development.

**OECD.** 2023. *Pensions at a glance 2023: OECD and G20 indicators*. Paris, Organisation for Economic and Co-operation Development.

**Orseau, E; Deboeck, B.** 2021. "The 2021 ageing report: Pension reform reversal and adequacy risks in the EU", in *Quarterly Report on the Euro Area (QREA)*, Vol. 20, No. 3.

**Párraga Rodríguez, S.** 2023. "The aggregate effects of government income transfers shocks: EU evidence", in *SERIEs*, Vol. 14, No. 1.

**Phelan, J.C.; Link, B.G.; Tehranifar, P.** 2010. "Social conditions as fundamental causes of health inequalities: Theory, evidence, and policy implications", in *Journal of Health and Social Behaviour*, Vol. 51.

**Picken, N. et al. 2023.** *Understanding decision making around changing the State Pension age: A review of international evidence*. London, Department for Work and Pensions.

**Pierson, P.** 1994**.** *Dismantling the welfare state? Reagan, Thatcher and the politics of retrenchment.* Cambridge, Cambridge University Press**.**

**Power, C.; Kuh, D.** 2006. "Life course development of unequal health", in J. Siegrist and M. Marmot (eds), *Socioeconomic position and health: New explanations and their policy implications*. London, Oxford University Press.

**Rabaté, S.; Rochut, J.** 2020. "Employment and substitution effects of raising the statutory retirement age in France", in *Journal of Pension Economics and Finance*, Vol. 19, No. 3.

**Raleigh, V. S.** 2019. *Trends in life expectancy in EU and Other OECD countries* (OECD Health Working Paper, No. 108). Paris, Organisation for Economic and Co-operation Development.

**Ritola, S.; Väänänen, N.** (eds). 2023. *Understanding Finnish pensions*. Helsinki, SKS Kirjat.

**Sacchi, S.** 2018. "The Italian welfare state in the crisis: Learning to adjust?", in *South European Society and Politics*, Vol. 23, No. 1.

**Sánchez-Barricarte, J. J.** 2018. "Measuring and explaining the baby boom in the developed world in the mid-twentieth century", in *Demographic Research*, Vol. 38, Art. 40.

**Sánchez-Romero, M.; Schuster, P.; Prskawetz, A.** 2024. "Redistributive effects of pension reforms: who are the winners and losers?", in *Journal of Pension Economics and Finance*, Vol. 23, No. 2.

**Sasson, I.** 2016. "Trends in life expectancy and lifespan variation by educational attainment: United States, 1990–2010", in *Demography*, Vol. 53.

**Schludi, M.** 2005. *The reform of Bismarckian pension systems: A comparison of pension politics in Austria, France, Germany, Italy and Sweden*. Amsterdam, Amsterdam University Press.

**Schmähl, W.; Viebrok, H.** 2000. "Adjusting pay-as-you-go financed pension schemes to increasing life expectancy", in *Journal of Contextual Economics – Schmollers Jahrbuch*, Vol. 120, No. 1.

**Schmidthuber, L., Schröder, H., Panzenböck, E.** 2016. "Retirement determinants in Austria: An aging society but a hesitant policymaker!?", in D. Hofäcker, M. Hess and S. König (eds), *Delaying retirement: Progress and challenges of active ageing in Europe, the United States and Japan*. London, Palgrave Macmillan.

**Shi, J.et al.** 2021. "The impact of income definitions on mortality inequalities", in *SSM – Population Health*, Vol. 15.

**Smith, J. P. 2004.** "Unraveling the SES: Health connection", in *Population and Development Review*, Vol. 30, Suppl.

**Soosaar, O.; Puur, A.; Leppik, L.** 2021. "Does raising the pension age prolong working Life? Evidence from pension age reform in Estonia", in *Journal of Pension Economics and Finance*, Vol. 20, No. 2.

**Staubli, S.; Zweimüller, J.** 2013. "Does raising the early retirement age increase employment of older workers?", in *Journal of Public Economics*, Vol. 108.

**Streeck, W.; Thelen, K.** 2005. "Introduction: Institutional change in advanced political economies", in W. Streeck and K. Thelen (eds), *Beyond continuity: Institutional change in advanced political economies*. Oxford, Oxford University Press.

**Tanaka, H. et al.** 2019. "Mortality inequalities by occupational class among men in Japan, South Korea and eight European countries: A national register-based study, 1990–2015", in *Journal of Epidemiology and Community Health*, Vol. 73, No. 8.

**Tepe, M.; Vanhuysse, P.** 2009. "Are aging OECD welfare states on the path to gerontocracy? Evidence from 18 democracies, 1980-2002", in *Journal of Public Policy*, Vol. 29, No. 1.

**Theodoropoulou, S.** 2015. "National social and labour market policy reforms in the shadow of EU bailout conditionality: The cases of Greece and Portugal", in *Comparative European Politics*, Vol. 13, No. 1.



**Tsebelis, G.** 2002. *Veto players: How political institutions work*. Princeton, NJ, Princeton University Press.

**UNDESA.** 2024. *World Population Prospects 2024*. New York, NY, United Nations Department of Economic and Social Affairs – Population Division.

**Vandenberghe, V.** 2024. "Partial de-annuitization of public pensions vs. retirement age differentiation: which is best to account for longevity differences?", in *Journal of Pension Economics and Finance*, Vol. 23, No. 1.

**Vidal, G.** 2019. *The political consequences of the Great Recession in Southern Europe: Crisis and representation in Spain* (PhD thesis). Florence, European University Institute.

**Vis, B.** 2016. "Taking stock of the comparative literature on the role of blame avoidance strategies in social policy reform", in *Journal of Comparative Policy Analysis: Research and Practice,* Vol. 18, No. 2.

**Vlandas, T**. 2023. "From gerontocracy to gerontonomia: The politics of economic stagnation in ageing democracies", in *The Political Quarterly*, Vol. 94, No. 3.

**Vogt, V.; Althammer, J.** 2016. "Linking retirement age to life expectancy in a Bismarckian system – the case of Germany", in *National Institute Economic Review*, Vol. 237, No. 1.

**Wallace, M.; Wilson, B.** 2022. "Age variations and population over-coverage: Is low mortality among migrants merely a data artefact?", in *Population Studies*, Vol. 76, No. 1.

**Weaver, K.** 1986. "The politics of blame avoidance", in *Journal of Public Policy,* Vol. 6, No. 4.

**Weaver, K.** 2010. "Paths and forks or chutes and ladders?: Negative feedbacks and policy regime change", in *Journal of Public Policy*, Vol. 30, No. 2.

**Weaver, K.** 2011. *The politics of automatic stabilization mechanisms in public pension programs* (WZB Discussion Paper, No. 2011-201). Berlin, Wissenschaftszentrum Berlin für Sozialforschung.

**Weber, D.; Loichinger, E.** 2022. "Live longer, retire later? Developments of healthy life expectancies and working life expectancies between age 50–59 and age 60–69 in Europe", in *European Journal of Ageing*, Vol. 19.

**Werding, M.; Runschke, B.; Schwarz, M.** 2024. *Alterungsschub und Rentenreform: Simulationen für GRV und Beamtenversorgung* (Arbeitspapier, No. 1). Berlin, Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Lage.

**Whiteside, N.** 2017. "Flexible employment and casual labour: Historical perspectives on labour market policy", in *History and Policy*, June.

**WHO.** 2024. *World health statistics 2024 – Monitoring health for the SDGs, Sustainable Development Goals*. Geneva, World Health Organization.

# Appendix I. Technical design of measures linking retirement age to life expectancy

The design of automatic adjustment mechanisms in general, and of policies linking the statutory retirement age to life expectancy in particular, involves many choices (Bosworth and Weaver, 2011: pp. 6–7; OECD, 2021: p. 92-96; Picken et al., 2023)). The flexibility arising from these choices can contribute to achieving the economic objectives of these policies and their political sustainability. As exemplified by the discussion in Chapter 2 (e.g. on "intergenerational actuarial neutrality") it is also important to take into account the institutional context when designing policies linking the retirement age to life expectancy. In the following we summarize some of the most important choices involved following closely the presentation of Picken et al. (2023) and complement the information provided there when necessary.

- Degree of automaticity

Even though the policy of linking retirement ages to life expectancy as discussed in this report involves automatic (i.e. nondiscretionary) adjustments to statutory retirement ages according to some formula in the event of changes in life expectancy, the "degree of automaticity" (Bosworth and Weaver, 2011: p. 7) can vary. Following Picken et al. (2023) we differentiate between "semi-automatic" and "fully automatic" adjustments depending on the degree of involvement of the parliaments (more generally the legislative branch) in a new statutory retirement age taking effect (see OECD, 2021: p. 93). Among the countries mentioned in Appendix II Denmark is the only one which has chosen semi-automatic adjustments in the above sense (see Appendix II).



- Direction of change

Policies linking the retirement age to life expectancy have been propagated and introduced to deal with the consequences of rising life expectancy. mainly introduced to adjust the retirement age to rising life expectancy. The rising mortality rates observed in most countries as a result of the COVID-19 pandemic and to a lesser extent the slowing down of mortality improvement even before the pandemic wake of the COVID-19 pandemic (Islam et al., 2021; Raleigh, 2019) show the importance of choices on how to react to a decrease in life expectancy. Both one-way mechanisms, which do not allow for a decrease in the retirement age as a result of a decrease in life expectancy and two-way mechanisms, which do, are prevalent (see Appendix II). In countries applying one-way mechanisms the formula defining the link between retirement age and life expectancy may still take into account previous drops in life expectancy in computation of future increases in the retirement age (see e.g. country profiles for Denmark and the Netherlands in Appendix II; see also OECD, 2021).

- Minimum and maximum change

Several countries limit the amount by which the statutory retirement age can change between revisions. In case a ceiling for changes is imposed, the countries may choose to take into account the part of the prescribed change in the retirement age exceeding the limit in the following periods (as is intended e.g. in Estonia, see Appendix II). Furthermore, the size of maximum and minimum increases can be affected by the frequency of revisions (comparing the Danish case with the rest of the countries appearing in Appendix II illustrates this point).

- Strength of the link between retirement age and life expectancy

In theory there are numerous approaches to determining how life expectancy gains are to be divided between working life and retirement. In practice, notwithstanding the differences in implementations, the chosen formulas de facto follow one of two objectives: they either aim to fix the expected number of years spent in retirement or the ratio of working years to expected years spent in retirement. The former objective requires that any changes in life expectancy is added to (or subtracted from) the previously existing retirement age. Whereas the latter objective requires roughly that retirement age is changed by two-thirds of the change in life expectancy. Following the objective of fixing the ratio of working years to retirement years more precisely would require amongst other things choosing an age at which some "standard" working career begins and computing the ratio of working years to expected retirement years at a given point in time. The Netherlands and Portugal simplify this process by changing the retirement age by two-thirds of changes in the life expectancy (corresponds to assuming that the above ratio is 2:1), whereas Finland aims for more precision (see Appendix II). It should also be noted that both of the mentioned objectives would in theory require the use of cohort life expectancies, which in practice are replaced by period life expectancy (see below).

In OECD (2021, p. 94) it is stated that under suitable demographic conditions and given an initially financially balanced pension system "a two-thirds link in a PAYG system basically ensures a stable pension replacement rate across generations financed by a stable contribution rate in a sustainable way." However, as hinted at both in Chapter 2 above and by OECD (2021, pp. 94–95) itself, the validity of the above statement can depend on the structural features of the pension system.



- Years between retirement age revisions

The most common frequency for revising the retirement age is annually, while longer intervals are rarely adopted. An exception is provided by Denmark which revises the retirement age every 5 years.

The length of the intervals between revisions directly affects the magnitude of adjustments to the retirement age. Longer intervals, such as the five-year revision period in Denmark, result in a less gradual progression compared to countries with more frequent adjustments. Consequently, the intended increases of either half a year or a full year produce more substantial differences in retirement ages for adjacent cohorts.

- Period between setting new retirement age and it taking effect

An aspect of policy design with which for example may be exploited to increase the political acceptance of measure linking retirement age to life expectancy is the choice of the length of the interval between the announcement of changes to the retirement age and their implementation. This choice influences both individuals' career planning and their transition to retirement. A longer notification period enhances predictability and thus may have political advantages. However, extended intervals also decrease the suitability of life expectancy indicators used for determination of retirement age for cohorts. In extreme scenarios, unforeseen developments could render a previously decided retirement age adjustment inappropriate. For example, an increase in the retirement age for younger may be followed a sustained rise in mortality rates, which could put into question the legitimacy of the policy measure.

- Reference age for calculation of remaining life expectancy

In the existing retirement age adjustment formulas, three approaches can be distinguished:

1. Fixed reference age: Most countries calculate the remaining life expectancy from a certain age (reference age), which remains unchanged between revisions. In many cases, this age closely corresponds to the retirement age at the time the mechanism was introduced. The most common reference age is 65, although other fixed age limits for the calculation, such as 60, are also used. As retirement ages shift over time, the reference age and the retirement age may increasingly diverge, potentially necessitating an adjustment of the mechanism.

2. Reference age linked to the unadjusted retirement age: In this approach, the remaining life expectancy is calculated based on the retirement age from the previous revision. Consequently, the reference age changes after each application of the adjustment mechanism.

3. "Iterative" approach: The third method uses an iterative process to calculate the adjusted retirement age, taking into account the life expectancy at the adjusted retirement age. Currently, only Finland uses this approach.

- Time period of data used for the computation of life expectancy indicators

Mortality rates are subject to annual fluctuations even in absence of global pandemics. Smoothing out such fluctuations may be desirable from both a technical and political perspective. To an extent the above-mentioned minimum and maximum allowed changes can help achieve this goal.



The sensitivity of retirement age calculations to short-term changes in mortality rates can heavily depend on the observation periods for the data used to estimate life expectancy. Observation periods are relevant at two stages within the mechanism:

1. Period life tables may be calculated using mortality data from multiple years (e.g. three years) to help smooth out or disregard short-term fluctuations. Alternatively, single calendar-year data may also be used. In the latter case, the calculated values become highly sensitive to short-term changes in mortality rates.

2. Independently of how period life tables are obtained, life expectancy indicators from multiple period life tables may be averaged to smooth out fluctuations: Some countries address the issue of sensitivity to short-term mortality fluctuations by averaging remaining life expectancy over multiple years (e.g. Denmark: 2-year average, Estonia: 5-year average; Slovakia: median of 7 five-year averages). This approach helps make changes to the retirement age more predictable.

- Period or cohort life expectancy?

Remaining life expectancy at different ages is calculated on the basis of mortality rates summarized in life tables. Mortality rates vary between genders and socio-economic groups (see Chapter 3). Since gender is not permitted as a basis for discrimination in many countries and discrimination according to other socio-economic criteria is not easily possible, unisex life tables for the whole population are usually used. In practice two types of life tables are used: period life tables und cohort life tables.

Period life tables summarize the mortality conditions of an entire population based on observation in a reporting period, usually no longer than three years and do not contain any assumptions about how mortality rates will change in the future. They therefore provide information on how many (additional) years of life a person would have ahead of them if they were exposed to the mortality rates of the period under review for the rest of their lives.

On the other hand, cohort life tables show the specific mortality of a birth cohort, but can only be definitively calculated once all members of this birth cohort have died. If this has not yet occurred for the relevant cohorts, the age-specific mortality rates must be estimated using past trends by projection methods in order to create a complete life table (see ONS, 2023). Another type of life tables which share some characteristics with both period and cohort life tables and whose construction can be an intermediate step in obtaining cohort life tables are projected period life tables. These aim to summarize the mortality conditions in a future time period (such as a calendar-year) and similarly to cohort life tables are obtained using past mortality trends and projection methods. For more on the relevance and consequences of the choice between life expectancy indicators obtained from period and cohort life tables see Chapter 2 and Chapter 4.

In practice, with the exception of the Netherlands which uses projected period life expectancy for computation of retirement age adjustments, all countries mentioned in Appendix II use life expectancy indicators arising from period life tables, which are constructed solely using observed mortality rates.

# Appendix II. Country profiles

This appendix contains country profiles providing more detail on the design of policy measures linking the statutory retirement age to life expectancy in chosen countries. The information was obtained from responses to a questionnaire sent to representatives from the corresponding countries and from Picken et al. (2023). Respondents to the questionnaire included experts from academia, social security institutions, and responsible ministries. In the country profiles links are also provided to the relevant legislation for further details.

In this appendix, "Year of taking effect" refers to the first year in which the retirement age is determined using the mechanism.

**Table II.1.** *Policy design choices for linking retirement age to life expectancy in Denmark*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | §1 Lov om ændring af lov om social pension (LOV nr 1586 af 20/12/2006: https://www.retsinformation.dk/eli/lta/2006/1586; LOV nr 1386 af 28/12/2011: https://www.retsinformation.dk/eli/lta/2011/1386)<br>§1 Bekendtgørelse af lov om social pension (https://www.retsinformation.dk/eli/lta/2024/1123) |
| | **Year of passage** | In 2006 was decided that in 2015 and every 5 years thereafter, the state pension age for persons born after 31 December 1962 shall be adjusted according to life expectancy. |
| | **Year of taking effect** | 1963 is the first birth cohort for which the mechanism applies (retirement age 68 in 2031). |
| | **Degree of automaticity** | Semi-automatic; parliamentary approval is required to change the statutory retirement age when applying the link |
| Characteristics of the change in retirement age | **Direction of change** | One-way; mechanism that ensures that, after a decline in life expectancy, the statutory retirement age does not increase until life expectancy reached the same level as it was before declining |
| | **Minimum/Maximum change** | The state pension age is adjusted by a maximum of 1 year at a time, rounded off to the nearest half year. |
| | **Change in retirement age as proportion of increase in LE** | 1; the link is made by fixing the period people can expect to live in retirement at 14.5 years (as it was in 2004-2005) |
| | **Years between retirement age revisions** | 5 |
| | **Period between setting new retirement age and it taking effect** | 15 |
| Data | **Reference age** | 60 |
| | **Time period of data used** | Average of the two years preceding the date of calculation |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Statistics Denmark |
| Indexation formula | **Formula** | $x_r(t) = 60 + [(e_{60}^P(t-15) + 0.6) - 14.5]$ |
| | **Description** | $x_r(t)$ … State pension age in year $t$<br>$e_{60}^P(t-15)$ … remaining life expectancy observed for people aged 60 over the past 2 years; in $t-15$<br>$0.6$ … the assumed increase in life expectancy (in years)<br>$14.5$ … the time (in years) that Danish policy aims for all people to spend in retirement while receiving State Pension |

**Table II.2.** *Policy design choices for linking retirement age to life expectancy in Estonia*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | § 71 Riikliku pensionikindlustuse seadus ( https://www.riigiteataja.ee/akt/114122023007)<br>§ 1 Riikliku pensionikindlustuse seaduse muutmise ja sellega seonduvalt teiste seaduste muutmise seadus (12.12.2018: https://www.riigiteataja.ee/akt/103012019001) |
| | **Year of passage** | 2018 |
| | **Year of taking effect** | 2027 |
| | **Degree of automaticity** | Fully automatic. The executive needs to ratify the adjustments. |
| Characteristics of the change in retirement age | **Direction of change** | Two-way |
| | **Minimum/Maximum change** | Pensionable age may be increased by not more than three months in a year. Where, according to calculations, pensionable age increases more than three months in a year, the pensionable age of the following years is adjusted by the months not taken into account upon increasing the pensionable age. |
| | **Change in retirement age as proportion of increase in LE** | 1 |
| | **Years between retirement age revisions** | 1 |
| | **Period between setting new retirement age and it taking effect** | 2 |
| Data | **Reference age** | 65 |
| | **Time period of data used** | The reference period is the period of four to eight years before the year for which the pensionable age is calculated. |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Calculation of pensionable age is based on the average life expectancy of men and women 65 years of age published each year by Statistics Estonia. |
| Indexation formula | **Formula** | $x_r(t) = 65 + \frac{\sum_{i=t-8}^{t-4} e_{65}^{P}(i)}{5} - \frac{\sum_{i=2018}^{2022} e_{65}^{P}(i)}{5}$ |
| | **Description** | $x_r(t)$ ... pensionable age in year $t$<br>$e_{65}^{P}(x)$ ... remaining life expectancy observed for people aged 65 in Year $x$ |

**Table II.3.** *Policy design choices for linking retirement age to life expectancy in Finland*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | § 82 and § 83 Laki työntekijän eläkelain muuttamisesta (29.01.2016: https://www.finlex.fi/fi/laki/alkup/2016/20160069) |
| | **Year of passage** | 2017 |
| | **Year of taking effect** | 2030 |
| | **Degree of automaticity** | Fully automatic; but according to § 218a, there will be an evaluation of the development of working life length starting from 2026 every five years to check the ratio of in-work/in-retirement. |
| Characteristics of the change in retirement age | **Direction of change** | Two-way |
| | **Minimum/Maximum change** | Maximum 2 month |
| | **Change in retirement age as proportion of increase in LE** | The retirement age of a person that was born in 1965 or later is determined so that the ratio between the difference of the retirement age and the age of 18 and the calculated life expectancy at the retirement age is the same as the ratio in 2025. |
| | **Years between retirement age revisions** | 1 (For each birth cohort at the age of 62 starting from 2027). |
| | **Period between setting new retirement age and it taking effect** | The retirement age is confirmed no later than one month before the beginning of the calendar year in which the age cohort turns 62. |
| Data | **Reference age** | New retirement age. The retirement age is set so that the ratio between the difference of the retirement age and the age of 18 and the calculated life expectancy at the new retirement age is the same as the ratio in 2025. |
| | **Time period of data used** | The reference period is the period of two to six years before the year for which the pensionable age is calculated |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Mortality statistics of Statistics Finland |
| Indexation formula | **Formula** | $\frac{x_r(t) - 18}{le(x_r(t), q_t)} = \frac{65 - 18}{le(65, q_{2025})}$ |
| | **Description** | $x_r(t)$ ... retirement age in year $t$<br>$le(x, q)$... the life expectancy for a person aged $x$, whose mortality rate is $q$<br>$q_t$... average mortality rate in years $t-6$, $t-5$, $t-4$, $t-3$ and $t-2$ |

**Table II.4.** *Policy design choices for linking retirement age to life expectancy in Greece*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | article 11 par.3 of the Law 3863/2010 (Gov. Gazette: 115 A): https://natlex.ilo.org/dyn/natlex2/natlex2/files/download/86883/2010-115.pdf |
| | **Year of passage** | 2010 |
| | **Year of taking effect** | 2021 |
| | **Degree of automaticity** | Fully automatic (made by a joint decision of the Ministers of Finance and Labour and Social Security; requires an explicit legal provision) |
| Characteristics of the change in retirement age | **Direction of change** | Two-way |
| | **Minimum/Maximum change** | - |
| | **Change in retirement age as proportion of increase in LE** | 1 |
| | **Years between retirement age revisions** | 3 |
| | **Period between setting new retirement age and it taking effect** | Max. 1 year |
| Data | **Reference age** | 65 |
| | **Time period of data used** | Average of preceding 10 years |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Mortality statistics of Statistics Finland |
| Indexation formula | **Formula** | |
| | **Description** | "The retirement age limits […] shall be adjusted in line with changes in the life expectancy of the country's population, with 65 years of age as the reference point. This paragraph shall enter into force on 1.1.2021 and, upon its first application, the change in the decade from 2010 to 2020 shall be taken into account. From 1.1.2024, the above limits shall be revised every three years. The adjustment of the retirement age limits shall be carried out by joint decision of the Ministers of Finance and Labour and Social Security, issued in the last year of each period on the basis of the relevant indicators determined by the Hellenic Statistical Authority and Eurostat for the following period." (article 11 par.3 of the Law 3863/2010 (Gov. Gazette: 115 A), translation DeepL, 08.07.2025) |

**Table II.5.** *Policy design choices for linking retirement age to life expectancy in Italy*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | 12 bis and 12 ter, art. 12-ter decreto-legge 31 maggio 2010, n. 78: https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legge:2010-05-31;78~art12 |
| | **Year of passage** | 2010 |
| | **Year of taking effect** | 2013 |
| | **Degree of automaticity** | Fully automatic |
| Characteristics of the change in retirement age | **Direction of change** | One-way |
| | **Minimum/Maximum change** | Maximum 3 month |
| | **Change in retirement age as proportion of increase in LE** | 1 |
| | **Years between retirement age revisions** | 3 |
| | **Period between setting new retirement age and it taking effect** | 2 |
| Data | **Reference age** | 65 |
| | **Time period of data used** | Average of preceding 3 years (the data relating to the variation over the previous three years of life expectancy at the age corresponding to 65 years with reference to the average of the population resident in Italy) |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | ISTAT (Italian National Institute for Statistics), which calculate the life expectancy. Starting from 2011 ISTAT shall make available annually, by 31 December of the same year, the data relating to the variation over the previous three years of life expectancy at the age corresponding to 65 years with reference to the average of the population resident in Italy. |
| Indexation formula | **Formula** | |
| | **Description** | The data relating to the variation over the previous three years of life expectancy at the age corresponding to 65 years with reference to the average of the population resident in Italy. The increase of life expectancy is translated into months and added to the current retirement age. |

**Table II.6.** *Policy design choices for linking retirement age to life expectancy in The Netherlands*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | Algemene Ouderdomswet, Hoofdstuk III Het ouderdomspensioen en de toeslag, §1, Artikel 7a:<br>2012: https://zoek.officielebekendmakingen.nl/stb-2012-328.pdf<br>2020: https://zoek.officielebekendmakingen.nl/stb-2020-503.html |
| | **Year of passage** | 2012 and 2020 (revision) |
| | **Year of taking effect** | 2024 and 2026 |
| | **Degree of automaticity** | Fully automatic |
| Characteristics of the change in retirement age | **Direction of change** | One-way |
| | **Minimum/Maximum change** | If change in retirement age is less than 0.25, it is set to 0. Otherwise, it shall be set to three months. |
| | **Change in retirement age as proportion of increase in LE** | 1 (between 2024 and 2026) and 2/3 (since 2026) |
| | **Years between retirement age revisions** | 1 |
| | **Period between setting new retirement age and it taking effect** | 5 years |
| Data | **Reference age** | 65 |
| | **Time period of data used** | 5 years in advance |
| | **Type of LE calculation** | Projected period-based life expectancy |
| | **Database** | CBS, the Central Bureau of Statistics in the Netherlands |
| Indexation formula | **Formula** | Since 2026:<br>$x_r(t) = \frac{2}{3} * (e_{65}(t) - 20.64) + 67$ |
| | **Description** | $x_r(t)$ ... retirement age in year $t$<br>$e_{65}(t)$ ... remaining life expectancy for people aged 65 in Year $t$<br>If change in retirement age $(x_r(t) - x_r(t-1))$ is negative or less than 0.25, it is set to 0. If change is 0.25 or more, it shall be set at three months. |

**Table II.7.** *Policy design choices for linking retirement age to life expectancy in Portugal*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | Decreto-Lei n.º 167-D/2013 Artigo 20. (31.12.2013: https://files.diariodarepublica.pt/1s/2013/12/25303/0036400369.pdf) |
| | **Year of passage** | 2013 |
| | **Year of taking effect** | 2015 |
| | **Degree of automaticity** | Fully automatic |
| Characteristics of the change in retirement age | **Direction of change** | Two-way |
| | **Minimum/Maximum change** | - |
| | **Change in retirement age as proportion of increase in LE** | 2/3 |
| | **Years between retirement age revisions** | 1 |
| | **Period between setting new retirement age and it taking effect** | 2 years |
| Data | **Reference age** | 65 |
| | **Time period of data used** | change in average life expectancy at the age of 65 from year 2012 to the second year before the year for which the pensionable age is calculated |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Statistics Portugal |
| Indexation formula | **Formula** | $x_r(t) = 66 + \sum_{i=2015}^{t} (e_{65}(i-2) - e_{65}(i-3)) * 12 * \frac{2}{3}$ |
| | **Description** | $e_{65}(i)$... *average life expectancy at the age of 65 in year i (in years)*<br>$66$... *normal age for access to pension in 2014*<br>$* 12$... *Conversion of years into months* |

**Table II.8.** *Policy design choices for linking retirement age to life expectancy in Slovakia*

| | | |
|---|---|---|
| Legislative Procedure | **Relevant legislation** | §65a Zákon č. 252/2012 (01.09.2012-01.06.2017: https://www.epi.sk/zz/2012-252)<br>Opatrenie č. 265/2019 Z. z. (31.10.2019: https://www.epi.sk/zz/2019-265; retirement age is set)<br>§65 and prílohe č. 3c.(3) Zákon č. 352/2022 (https://www.epi.sk/zz/2022-352) |
| | **Year of passage** | 2012 (09/2019 reversal); 2022 |
| | **Year of taking effect** | 2017 (until 2019); 2031 |
| | **Degree of automaticity** | Fully automatic |
| Characteristics of the change in retirement age | **Direction of change** | One-way (unless life expectancy decreases for more than three years in a seven-year reference period) |
| | **Minimum/Maximum change** | - |
| | **Change in retirement age as proportion of increase in LE** | 1 |
| | **Years between retirement age revisions** | 1 |
| | **Period between setting new retirement age and it taking effect** | 6 years |
| Data | **Reference age** | reference age, which is the unadjusted general retirement age of individuals born in the calendar year immediately preceding the respective birth cohort, rounded down to whole years |
| | **Time period of data used** | From 2 to 13 years previously |
| | **Type of LE calculation** | Observed Period-based life expectancy |
| | **Database** | Statistical Office of the Slovak Republic |
| Indexation formula | **Formula** | (Old formula see: https://economy-finance.ec.europa.eu/document/download/9d858e5d-9263-4055-a008-162bf459da4e_en?filename=2024-ageing-report-country-fiche-Slovakia.pdf)<br>Since 2022:<br>$x_r(c) = x_r(c-1) + median\left(\frac{e_{x_{c-1}}(t-2) - e_{x_{c-1}}(t-7)}{5}, \frac{e_{x_{c-1}}(t-3) - e_{x_{c-1}}(t-8)}{5}, \frac{e_{x_{c-1}}(t-4) - e_{x_{c-1}}(t-9)}{5}, \frac{e_{x_{c-1}}(t-5) - e_{x_{c-1}}(t-10)}{5}, \frac{e_{x_{c-1}}(t-6) - e_{x_{c-1}}(t-11)}{5}, \frac{e_{x_{c-1}}(t-7) - e_{x_{c-1}}(t-12)}{5}, \frac{e_{x_{c-1}}(t-8) - e_{x_{c-1}}(t-13)}{5}\right)$ |
| | **Description** | $x_r(c)$... unadjusted general retirement age for cohort c determined in years rounded to four decimal places.<br>$c$... respective birth cohort for which the unadjusted general retirement age is determined<br>$t$... calendar year for which the unadjusted retirement age is determined for the respective birth cohort for the purpose of establishing the general retirement age for the respective birth cohort by a generally binding legal regulation the Law on Social Insurance No. 461/2003 according to § 65 section 8 |

# Appendix III. Retirement age

**Table III.1.** *Change in retirement age in Denmark*

| | Year of birth | Retirement age |
|---|---|---|
| Discretionary change | before 1 January 1954 | 65 years |
| | 1 January 1954 to 30 June 1954. | 65 years 6 ms |
| | 1 July 1954 to 31 December 1954 | 66 years |
| | 1 January 1955 to 30 June 1955 | 66 years 6 ms |
| | 1 July 1955 to 31 December 1962 | 67 years |
| Change due to mechanism | 1 January 1963 to 31 December 1966 | 68 years |
| | after 31 December 1966 | 69 years |

*Source:* Responses to questionnaire

**Table III.2.** *Change in retirement age in Estonia*

| | Year of birth | Retirement age |
|---|---|---|
| Discretionary change | 1953 | 63 years |
| | 1954 | 63 years 3 ms |
| | 1955 | 63 years 6 ms |
| | 1956 | 63 years 9 ms |
| | 1957 | 64 years |
| | 1958 | 64 years 3 ms |
| | 1959 | 64 years 6 ms |
| | 1960 | 64 years 9 ms |
| | 1961 | 65 years |
| Change due to mechanism | 1962 | 65 years 1 ms (government must confirm the retirement age for 2027 by the start of 2025) |

*Source:* Responses to questionnaire

**Table III.3.** *Change in retirement age in Finland*

| | Year of birth | Retirement age |
|---|---|---|
| Discretionary change | 1954 | 63 years |
| | 1955 | 63 years and 3 ms |
| | 1956 | 63 years and 6 ms |
| | 1957 | 63 years and 9 ms |
| | 1958 | 64 years |
| | 1959 | 64 years and 3 ms |
| | 1960 | 64 years and 6 ms |
| | 1961 | 64 years and 9 ms |
| | 1962–1964 | 65 years |

*Source:*Responses to questionnaire

**Table III.4.** *Change in retirement age in Italy*

| | Year | Retirement age | | |
|---|---|---|---|---|
| | | Employees and self-employed* | Female employees private sector | Self-employed women |
| Discretionary change | 2012 | 66 years | 62 years | 63 years 6 ms |
| Change due to mechanism | 2013 | 66 years 3 ms | 62 years 3 ms | 63 years 9 ms |
| | 2014 | 66 years 3 ms | 63 years 9 ms | 64 years 9 ms |
| | 2015 | 66 years 3 ms | 63 years 9 ms | 64 years 9 ms |
| | 2016 | 66 years 7 ms | 65 years 7 ms | 66 years 1 ms |
| | 2017 | 66 years 7 ms | 65 years 7 ms | 66 years 1 ms |
| | 2018 | 66 years 7 ms | 66 years 7 ms | 66 years 7 ms |
| | 2019 | 67 years | 67 years | 67 years |
| | 2020 | 67 years | 67 years | 67 years |
| | 2021 | 67 years | 67 years | 67 years |
| | 2022 | 67 years | 67 years | 67 years |
| | 2023 | 67 years | 67 years | 67 years |
| | 2024 | 67 years | 67 years | 67 years |
| | 2025 | 67 years | 67 years | 67 years |

*Note:* *Excluding female employees in the private sector and Self-employed women.

*Source:*Responses to questionnaire.

**Table III.5.** *Change in retirement age in the Netherlands*

| | Year | Retirement age status 2023 (status 2012) |
|---|---|---|
| Discretionary change | 2013 | 65 years 1 ms |
| | 2014 | 65 years 2 ms |
| | 2015 | 65 years 3 ms |
| | 2016 | 65 years 6 ms (65 years 5 ms) |
| | 2017 | 65 years 9 ms (65 years 7 ms) |
| | 2018 | 66 years (65 years 9 ms) |
| | 2019 | 66 years 4 ms (66 years) |
| | 2020 | 66 years 4 ms (66 years 3 ms) |
| | 2021 | 66 years 4 ms (66 years 6 ms) |
| | 2022 | 66 years 7 ms (66 years 9 ms) |
| | 2023 | 66 years 10 ms (67 years) |
| | 2024 | 67 years |
| | 2025 | 67 years |
| Change due to mechanism | 2026 | 67 years |
| | 2027 | 67 years |
| | 2028 | 67 years 3 ms |
| | 2029 | 67 years 3 ms |
| | 2030 | 67 years 3 ms |

*Source:*Responses to questionnaire.

**Table III.6.** *Change in retirement age in Portugal*

| | Year | Retirement age status 2023 (status 2012) |
|---|---|---|
| Discretionary change | 2013 | 65 years |
| | 2014 | 66 years* |
| Change due to mechanism | 2015 | 66 years |
| | 2016 | 66 years 2 ms |
| | 2017 | 66 years 3 ms |
| | 2018 | 66 years 4 ms |
| | 2019 | 66 years 5 ms |
| | 2020 | 66 years 5 ms |
| | 2021 | 66 years 6 ms |
| | 2022 | 66 years 7 ms |
| | 2023 | 66 years 4 ms |
| | 2024 | 66 years 4 ms |
| | 2025 | 66 years 7 ms |

*Note:* Separate adjustment in accordance with the n.º 2 do artigo 20.º, do Decreto -Lei n.º 187/2007, de 10 de maio.
*Source:*Responses to questionnaire.

**Table III.7.** *Change in retirement age in Slovakia*

| Year of birth | Retirement age | | | | | |
|---|---|---|---|---|---|---|
| | Male | Female | Female (1 child) | Female (2 children) | Female (3 or 4 children) | Female (5+ children) |
| 1943 | 60 years | 57 years | 56 years | 55 years | 54 years | 53 years |
| 1944 | 60 years 9 m | 57 years | 56 years | 55 years | 54 years | 53 years |
| 1945 | 61 years 6 m | 57 years | 56 years | 55 years | 54 years | 53 years |
| 1946 | 62 years | 57 years | 56 years | 55 years | 54 years | 53 years |
| 1947 | 62 years | 57 years 9 m | 56 years | 55 years | 54 years | 53 years |
| 1948 | 62 years | 58 years 6 m | 56 years 9 m | 55 years | 54 years | 53 years |
| 1949 | 62 years | 59 years 3 m | 57 years 6 m | 55 years 9 m | 54 years | 53 years |
| 1950 | 62 years | 60 years | 58 years 3 m | 56 years 6 m | 54 years 9 m | 53 years |
| 1951 | 62 years | 60 years 9 m | 59 years | 57 years 3 m | 55 years 6 m | 53 years 9 m |
| 1952 | 62 years | 61 years 6 m | 59 years 9 ms | 58 years | 56 years 3 m | 54 years 6 m |
| 1953 | 62 years | 62 years | 60 years 6 ms | 58 years 9 m | 57 years | 55 years 3 m |
| 1954 | 62 years | 62 years | 61 years 3 ms | 59 years 6 m | 57 years 9 m | 56 years |
| 1955 | 62 years 76 d* | 62 years 76 d* | 62 years 76 d | 60 years 3 m | 58 years 6 m | 56 years 9 m |
| 1956 | 62 years 139 d* | 62 years 139 d* | 62 years 139 d | 61 years | 59 years 3 m | 57 years 6 m |
| 1957 | 62 years 6 m | 62 years 6 m | 62 years | 61 years 6 m | 60 years | 58 years 3 m |
| 1958 | 62 years 8 m | 62 years 8 m | 62 years 2 m | 61 years 8 m | 60 years 9 m | 59 years |
| 1959 | 62 years 10 m | 62 years 10 m | 62 years 4 m | 61 years 10 m | 61 years 4 m | 59 years 9 m |
| 1960 | 63 years | 63 years | 62 years 6 m | 62 years | 61 years 6 m | 60 years 6 m |
| 1961 | 63 years 2 m | 63 years 2 m | 62 years 8 m | 62 years 2 m | 61 years 8 m | 61 years 3 m |
| 1962 | 63 years 4 m | 63 years 4 m | 62 years 10 m | 62 years 4 m | 61 years 10 m | 61 years 7 m |
| 1963 | 63 years 6 m | 63 years 6 m | 63 years m | 62 years 6 m | 62 years | 61 years 11 m |
| 1964 | 63 years 8 m | 63 years 8 m | 63 years 2 m | 62 years 8 m | 62 years 2 m | 62 years 2 m |
| 1965 | 63 years 10 m | 63 years 10 m | 63 years 4 m | 62 years 10 m | 62 years 4 m | 62 years 4 m |
| 1966 | 64 years | 64 years | 63 years 6 m | 63 years | 62 years 6 m | 62 years 6 m |

*Note:* m=m; d=day *Discretionary change except (*), which resulted from the mechanism introduced in 2012. Changes for cohorts born after 1966, retirement due to mechanism (2031 at the earliest).

*Source:*2024 Ageing Report: Slovak Republic – Country Fiche.

4 route des Morillons
Case postale 1
CH-1211 Geneva 22

T: +41 22 799 66 17
E: issa@ilo.org
**www.issa.int**