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**PENSIONI E LONGEVITÀ:
DALLA SOSTENIBILITÀ DEL SISTEMA
ALLA PREPARAZIONE INDIVIDUALE**

**PENSIONS AND LONGEVITY:
FROM SYSTEM SUSTAINABILITY TO
INDIVIDUAL PREPAREDNESS**

Direzione centrale
Studi e Ricerche



Pensions and Longevity: From System Sustainability to Individual Preparedness¹

Abstract

This paper argues that, as individual longevity increases, pension policy should complement its traditional focus on system sustainability with a stronger concern for individual preparedness. Averages such as life expectancy, retirement duration and pension income are essential for managing pension systems, but they may conceal substantial heterogeneity in individual experiences. Using administrative data from the Italian National Social Security Institute (INPS), the paper shows that the relevant risk is not longevity per se, but the combination of long pension duration, low pension income and limited private or household buffers. This condition is interpreted as potential longevity fragility. The paper suggests that pension institutions can play a broader role than simply administering benefits. By using administrative information on contribution histories and pension entitlements, they can help inform individuals, detect fragile trajectories before retirement, and support policies aimed at preventing financial hardship in old age.

1. Introduction

Population ageing has transformed the pension debate over the past three decades. As life expectancy has increased, policymakers have focused primarily on one question: can pension systems afford longer lives? Pension reforms across Europe have therefore sought to restore financial sustainability through higher retirement ages, tighter eligibility conditions, revised benefit

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formulas and stronger links between contributions and pensions. In many countries, including Italy, these reforms have substantially improved the long-term financial outlook of public pension systems.

This chapter argues that financial sustainability, while essential, addresses only one dimension of the longevity challenge. Pension reforms can restore the long-term balance of public finances without ensuring that individuals are adequately equipped to finance increasingly long retirements. Fiscal sustainability and individual preparedness are therefore complementary objectives. The former asks whether pension systems can afford longer lives; the latter asks whether individuals can. As longevity increases, pension policy must address both questions.

Individual preparedness depends not only on the level of pension income but also on how long that income is expected to last and, more broadly, on the availability of other financial resources. Yet neither longevity nor retirement resources are evenly distributed. Some individuals spend only a few years in retirement, while others remain retired for several decades. Pension incomes are equally heterogeneous, reflecting differences accumulated over the working life. Average indicators, although indispensable for pension finance, therefore provide only limited guidance for assessing whether individuals are financially prepared for long retirement horizons.

This chapter proposes individual preparedness as a complementary objective of pension policy and introduces longevity fragility as an empirical framework for identifying retirees who may be insufficiently prepared for increasingly long retirements. Rather than treating pension adequacy and longevity separately, the framework considers their joint distribution, recognising that preparedness depends on both the resources available at retirement and the length of time those resources must sustain.

Italy provides a particularly informative setting because the administrative records of the Italian National Social Security Institute (INPS) make it possible to observe both retirement duration and pension income at the individual level. Using these data, the chapter documents the heterogeneity

concealed by average indicators, highlights the pronounced gender gradient in pension resources and identifies the share of retirees potentially exposed to longevity fragility.

The remainder of the chapter is organised as follows. Section 2 develops the concept of individual preparedness and introduces longevity fragility as an empirical measure of insufficient preparedness. Sections 3 and 4 examine the distributions of retirement duration and pension income. Section 5 combines these dimensions to identify individuals potentially exposed to longevity fragility. Section 6 discusses the policy implications, focusing on the evolving role of pension institutions in promoting individual preparedness. Section 7 concludes.

2. Longevity Fragility: A Distributional Perspective on Individual Preparedness

The distinction between system sustainability and individual preparedness raises an important measurement question: how should individual preparedness be assessed?

Existing indicators provide only partial answers because they are designed to address different policy questions. Measures of pension system sustainability evaluate the long-run financial viability of current rules, while measures of pension adequacy focus on retirement income, typically through replacement rates or poverty indicators. Demographic indicators measure longevity but say little about the financial resources available to sustain it. None of these approaches jointly considers retirement duration and retirement resources. As a result, they provide only a partial assessment of individual preparedness.

We define individual preparedness as the extent to which an individual's financial resources are sufficient to sustain consumption over the expected duration of retirement. Preparedness depends both on the resources available and on the length of time they are expected to finance retirement. Because preparedness cannot be observed directly, this chapter introduces longevity fragility as an empirical manifestation of insufficient preparedness. The concept shifts attention from the adequacy of pension income at retirement to its adequacy over the entire retirement horizon.

Preparedness is inherently a distributional concept. Individuals with similar pension incomes may differ substantially in their preparedness because they face different retirement durations, while individuals with similar retirement horizons may have very different financial resources. Preparedness therefore depends on the joint distribution of retirement duration and financial resources rather than on either dimension in isolation.

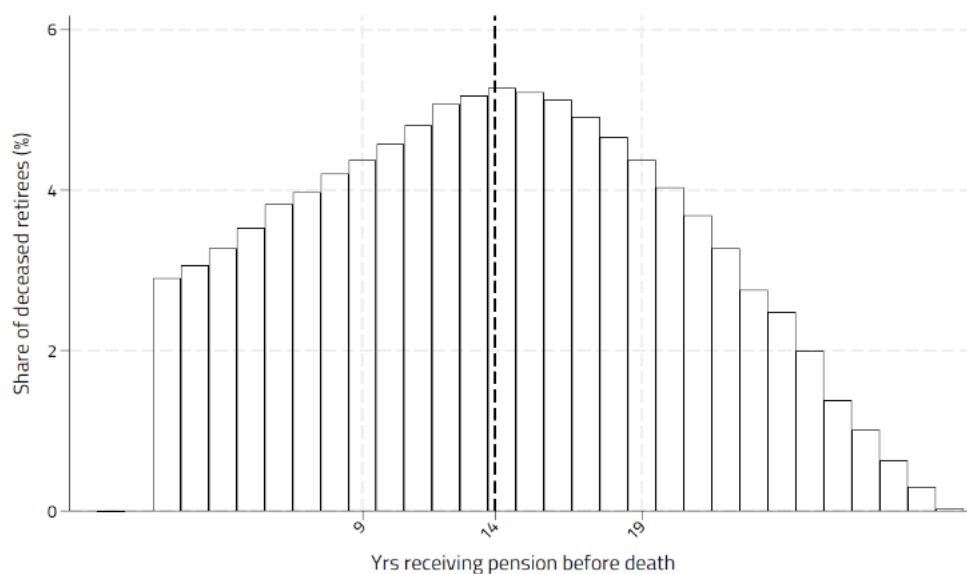
Financial resources extend beyond pension income to include private savings, housing wealth and family support. However, comprehensive information on these resources is generally unavailable in administrative data. The empirical analysis therefore focuses on pension income, interpreted as the observable financial floor of retirement, together with retirement duration. Although this operationalisation does not capture every source of financial resilience, it provides a transparent and policy-relevant proxy for identifying retirees whose observable resources appear least able to sustain long retirement horizons.

3. Retirement Duration: The First Dimension of Individual Preparedness

The empirical analysis uses INPS administrative microdata on private-sector employees born between 1940 and 1950 who retired on an old-age or early retirement pension. These cohorts are particularly informative because they include both completed and ongoing retirement spells, making it possible to examine retirement duration while accounting for right censoring.

Figure 1 shows the distribution of completed retirement durations among deceased retirees. The average duration is approximately 14 years. While this is the statistic typically reported in actuarial analyses, it conceals substantial heterogeneity. One-third of retirees received a pension for fewer than 10 years, whereas almost one-quarter received one for more than 20 years. The average retiree, therefore, is a poor guide to the financial demands individuals face over retirement.

Figure 1. Distribution of retirement duration among deceased retirees.

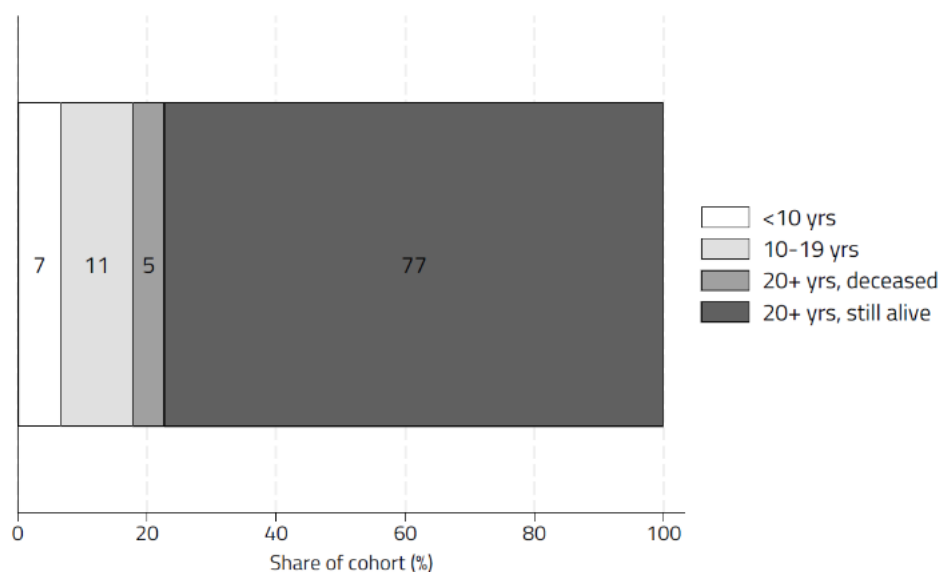


Notes: The black dashed line indicates the sample mean, which is equal to 14 years. The numbers 9, 14 and 19 denote the 25th, 50th and 75th percentiles, respectively. Sample restricted to private-sector employees receiving an old-age or early retirement pension from the 1940–1950 birth cohorts. Source: Authors' calculations based on INPS administrative records.

Figure 1 is based on completed retirement spells, observed only for retirees who have died.² Pension spells for surviving retirees remain right-censored and continue to lengthen over time. Consequently, the upper tail of the retirement-duration distribution is only partially observed. As shown in Figure 2, by 2024, 82 percent of retirees in these cohorts had already accumulated at least 20 years of pension receipt; for those still alive, these durations represent lower bounds rather than completed retirement spells.

² Approximately 23 percent of retirees of these cohorts have died by the end of 2024.

Figure 2. Distribution of observed retirement duration among all retirees.



Notes: Includes both deceased and surviving retirees from the 1940–1950 birth cohorts. Sample restricted to private-sector employees receiving an old-age or early retirement pension. Source: Authors' calculations based on INPS administrative records.

Right censoring is not random. Among the cohorts examined, 28 percent of men had died by 2024, but only 16 percent of women. Individuals with the longest retirement spells are disproportionately women and therefore underrepresented in the completed-duration distribution. The missing right tail of the distribution is larger for women, which means that analyses based solely on deceased retirees systematically understate the longevity exposure of women. This is particularly important because women also receive substantially lower pensions, making them the group most likely to experience insufficient preparedness.

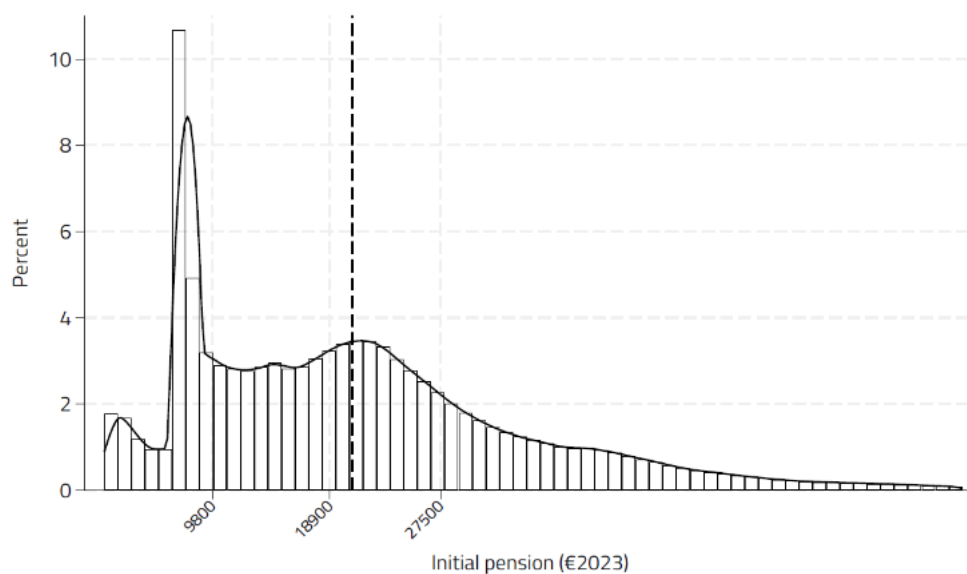
Retirement duration varies far more than aggregate indicators suggest and is therefore a key dimension of individual preparedness. The next section examines the second dimension—pension income.

4. Pension Income: The Second Dimension of Individual Preparedness

The financial resources available during retirement constitute the second dimension of individual preparedness. While retirement duration determines how long resources must last, pension income determines how much is available to finance that period.

Figure 3 reports the distribution of initial pension income. Among the cohorts examined, the average initial annual gross pension is approximately €20,700 (in 2023 euros). As with retirement duration, however, the average conceals substantial heterogeneity. Nearly 30 percent of retirees entered retirement with an initial pension below €12,000 per year, leaving little room to absorb rising health expenditures, long-term care needs or other unexpected shocks over a lengthy retirement. From the perspective of individual preparedness, the lower tail of the distribution is considerably more informative than the average.

Figure 3. Distribution of initial pension income.



Notes: The black dashed line indicates the sample mean, which is equal to €21,100. The values 9,800, 18,900 and 27,500 denote the 25th, 50th and 75th percentiles, respectively. The spike reflects the means-tested minimum pension supplement. Sample restricted to private-sector employees receiving an old-age or early retirement pension from the 1940–1950 birth cohorts. Source: Authors' calculations based on INPS administrative records.

The gender gradient is equally striking. The average initial annual gross pension is approximately €26,100 for men but only €13,800 for women—roughly half as much. This gap largely reflects differences accumulated over the working life in earnings, labour-market participation, career continuity and working hours rather than the design of the pension system itself.

Combined with the evidence on retirement duration, these differences point to a compounded disadvantage for women. They not only receive substantially lower pensions but also tend to experience longer retirements because of higher longevity. The interaction between these two dimensions is examined in the next section.

5. Combining the Two Dimensions of Individual Preparedness

The previous sections have shown that retirement duration and pension income are both highly heterogeneous. Considered separately, however, neither is sufficient to assess individual preparedness, which depends on their interaction. This section combines the two dimensions to identify retirees who may be insufficiently prepared for increasingly long retirement horizons.

For illustrative purposes, retirees are classified according to whether their initial annual pension falls below 60 percent of the median initial pension—approximately €13,000 in 2023 euros, following the conventional threshold used in relative poverty analysis—and whether their observed retirement duration has reached 20 years by 2024. This simple classification highlights substantial differences in individual preparedness.

Table 1 combines pension income and retirement duration. Most retirees combine relatively adequate pension resources with long retirement durations, while a sizeable minority combine relatively low pension resources with already lengthy retirement spells. Approximately one-quarter of the cohort falls into this latter group, having received an initial pension below €13,000 and accumulated at least 20 years of pension receipt by 2024. Importantly, these individuals are not necessarily poor. Rather, they are those whose observable pension resources appear least consistent with the financial demands implied by long retirement horizons.

Table 1. Individual preparedness: joint classification by pension income and retirement duration.

	<20yrs observed pension duration	20+yrs observed pension duration
Pension above low- pension threshold	<i>Adequate pension, shorter spell</i> 13%	<i>Long duration, adequate pension</i> 57%
Pension below low- pension threshold	<i>Low pension exposure</i> 5%	<i>Potential longevity fragility</i> 25%

Notes: The low-pension threshold is set at 60 percent of the median initial pension among retirees from the 1940–1950 birth cohorts, following the conventional threshold used in relative poverty analysis. Sample restricted to private-sector employees receiving an old-age or early retirement pension.

Several qualifications should be borne in mind. This classification is not intended to measure poverty or financial hardship. For retirees still alive in 2024, observed retirement duration is a right-censored lower bound, and completed spells will therefore be longer. Likewise, although the low-pension threshold follows the conventional 60-percent-of-the-median criterion used in relative poverty analysis, it serves here only as a benchmark for identifying pensions in the lower tail of the distribution. The classification should therefore be interpreted as an indicator of potential insufficient preparedness rather than realized deprivation.

Nevertheless, the findings are policy relevant because they show that administrative data can identify individuals whose observable pension resources appear least able to sustain long retirement horizons, creating the opportunity to intervene before insufficient preparedness translates into hardship.

A further insight concerns the origins of insufficient preparedness. When potential longevity fragility is examined by years of contributions, a clear gradient emerges: it is concentrated among workers with short contribution histories. Pension income is the cumulative reflection of a working life—its interruptions, part-time spells and transitions between employment and non-employment. Individual preparedness is therefore largely determined well before retirement, implying that policies aimed only at retirees address its consequences rather than its origins.

More broadly, this analysis shows that administrative records can do more than describe retirement outcomes ex post. They can identify life-course trajectories associated with insufficient preparedness, providing the basis for preventive rather than purely compensatory pension policies.

6. Supporting Individual Preparedness: The Evolving Role of Pension Institutions

The evidence presented in the previous sections suggests that pension institutions can contribute to individual preparedness in ways that extend beyond the traditional administration of pension benefits. If administrative records can identify individuals at risk of insufficient preparedness, they can also support earlier and more targeted interventions.

Preparedness develops over the life course rather than emerging at retirement. Administrative microdata therefore allow pension institutions to move upstream—using contribution records to identify trajectories associated with insufficient preparedness well before pension receipt begins. Three complementary functions emerge.

The first is to inform. Most workers have limited understanding of their future pension and even less awareness of the resources needed to sustain a potentially long retirement. Pension projections under alternative retirement ages and longevity scenarios would improve the information available for retirement planning. Several European countries have moved in this direction through pension tracking systems and *orange envelope*-style communications. Italy has made progress in this direction, but the integration of pension projections with explicit longevity scenarios remains limited.

The second is to detect. Contribution records reveal early signals of insufficient preparedness, including fragmented careers, prolonged periods of low or zero contributions and low expected pension entitlements. Identifying these trajectories years before retirement would allow targeted communication, incentives for voluntary contributions and better coordination with broader social protection policies.

The third is to protect. Once individuals at risk have been identified, institutional design can provide targeted support through contribution credits for care periods and involuntary career interruptions, minimum pension provisions that avoid perverse incentives, and better integration between pension policy and long-term care. Such measures are particularly relevant for workers with fragmented careers, who are disproportionately women.

Together, these three functions define a broader preparedness role for pension institutions without requiring a fundamental redesign of pension formulas. They are fully compatible with the actuarial sustainability achieved through the NDC transition and subsequent reforms.

The transition from system sustainability to individual preparedness therefore does not require replacing one objective with another. Financial sustainability ensures that pension systems remain capable of financing longer lives collectively; individual preparedness seeks to ensure that people possess the resources to sustain those longer lives themselves. Administrative data make it increasingly possible to pursue both objectives simultaneously.

7. Conclusions

This chapter argued that the longevity challenge has two complementary dimensions. The first concerns whether pension systems remain financially sustainable as populations age. The second concerns whether individuals are financially prepared to sustain increasingly long retirements. While pension reforms have rightly focused on the former, the latter has received much less attention.

To address this gap, the chapter has proposed individual preparedness as a complementary objective of pension policy and introduced longevity fragility as an empirical framework for identifying retirees whose observable pension resources appear least consistent with long retirement horizons. Using INPS administrative microdata, the analysis has shown that retirement duration and pension income are both highly heterogeneous and that only their joint distribution provides a meaningful assessment of preparedness.

The results also suggest that insufficient preparedness is largely shaped before retirement. Pension income reflects cumulative employment histories, implying that preparedness is a life-course outcome rather than a condition that emerges at retirement. Administrative data can therefore support earlier identification of individuals at risk, improve retirement planning and provide the basis for more preventive policy interventions.

Ultimately, individual preparedness complements rather than replaces financial sustainability as an objective of pension policy. Financial sustainability ensures that pension systems can finance longer lives collectively; individual preparedness asks whether people possess the resources to sustain those longer lives themselves. Administrative data make it increasingly possible to pursue both objectives simultaneously.