



# Resilient pension systems in a small open economy

Sustainability, longevity and intergenerational risk sharing  
in Iceland

Sigurður Freyr Jónatansson, Central Bank of Iceland

6th European  
Congress of Actuaries  
[www.eca2026.org](http://www.eca2026.org)



# Start with the comparison: four adjustment logics

Same actuarial problem: longer lives and uncertain returns. Different systems make the adjustment in different places.

**Denmark**

## **Retirement timing**

State pension age is linked to life expectancy; labour-market pensions absorb investment risk through product design.

**Netherlands**

## **Contract design**

The transition to collective DC makes risk sharing more explicit and less dependent on opaque promises.

**Sweden**

## **Automatic balance**

The income pension has an automatic balancing mechanism when liabilities exceed assets.

**Iceland**

## **Fund rules**

A large funded occupational pillar adjusts through actuarial balance, rights, accruals and fund governance.

Sources: official pension-system information from Denmark, Netherlands and Sweden; Icelandic supervisory material and fund regulation.

# The lesson for Iceland: borrow mechanisms, not institutions

The most useful comparison is not a ranking. It is a menu of stabilisers.

## Longevity-linked timing

Borrow from Denmark

When lives lengthen, some of the adjustment can move through retirement timing rather than through sudden benefit cuts.

## Explicit collective risk sharing

Borrow from Netherlands

Collective risk sharing can be preserved while making allocation of gains and losses more transparent.

## Rule-based balancing

Borrow from Sweden

Automatic rules are politically awkward, but actuarially honest and easier to explain before stress arrives.

**Iceland can keep the funded collective model - but make the adjustment rules clearer.**

# Why Iceland is a valuable actuarial test case

A small country with a very large funded pension balance sheet is a useful laboratory for sustainability and financial-stability questions.

**~179%**

pension fund assets / GDP  
end-2025

**~50%**

share of assets in the  
three largest funds

**97%**

assets in the 15 largest  
funds

**12%+**

mandatory contribution  
rate in the labour market

- The pension system is not just a retirement-income system; it is part of the financial system.
- Domestic investment capacity is finite, so foreign diversification is necessary.
- Scale and concentration make governance and adjustment rules more important, not less.

Sources: Central Bank of Iceland financial-stability and supervision material; Icelandic pension legislation and public information.

# 2014 baseline: adequacy was strong, but uneven

The Retirement Savings Adequacy report is a useful starting point: it found high overall replacement rates, but also clear gaps by sector, contribution history and gender.

**RETIREMENT SAVINGS ADEQUACY  
IN ICELAND**

**Abstract — page 2**

2014 report measuring retirement savings adequacy across Icelandic households and individuals, covering Pillars I, II and III and the role of housing wealth.

**103%**
Projected net replacement rate from Pillars I–III over all subgroups

**2/3**
Approximate share of pension income from Pillar II occupational pensions

**64%**
Overall Pillar II replacement ratio, against a 56% benchmark

**55%**
Private-sector pensioners below the 56% benchmark

**24%**
Average pension-income gap: males above females

Source: Retirement Savings Adequacy in Iceland, December 2014, Abstract, p. 2.

2014 report page 2 excerpt

Source: Retirement Savings Adequacy in Iceland, December 2014, Abstract, p. 2.

## Overall result

Net replacement rate from Pillars I–III was projected at 103% across all subgroups.

## Pillar II backbone

Occupational pensions accounted for roughly two-thirds of pension income; Pillar I complemented low pensions.

## Adequacy gap

Nearly one-third were below the 56% Pillar II benchmark; private-sector results were weaker.

## Contribution years matter

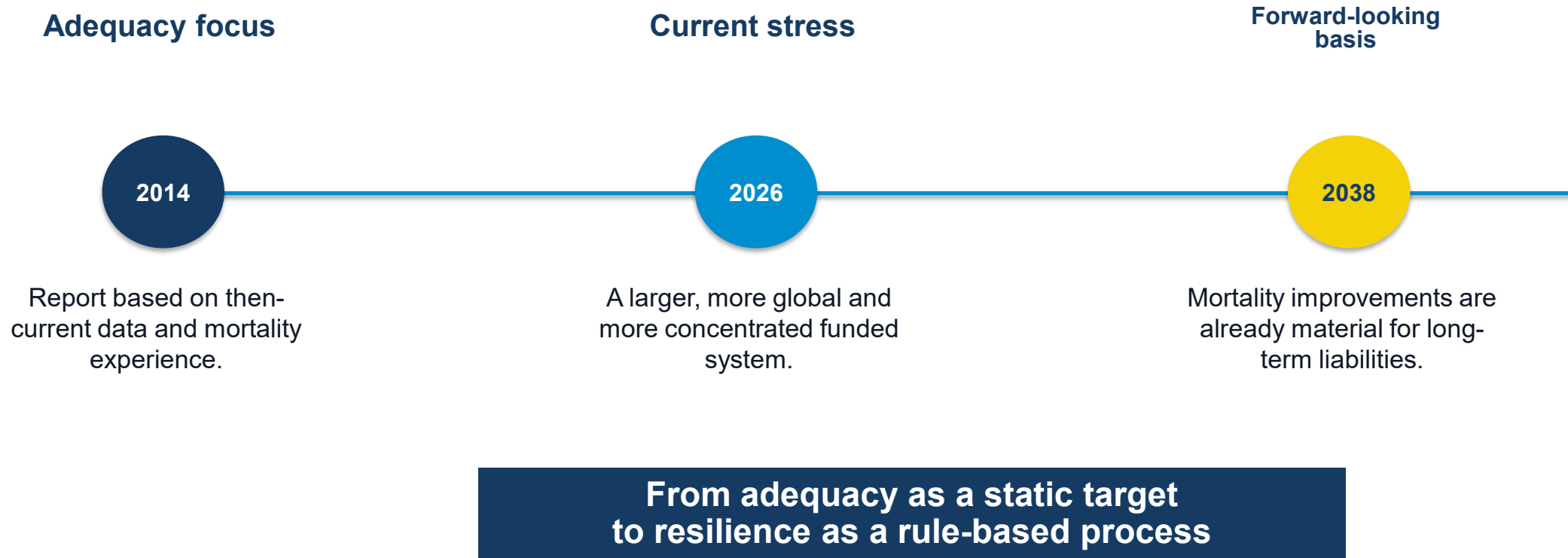
Private-sector replacement was projected at 54%, with 55% below the 56% target.

## Why this matters for the 2026 update

- The old question: is pension income adequate?
- The updated question: can adequacy survive longer lives and a tougher investment environment?
- The policy focus shifts from average replacement rates to the distribution of adjustment burdens.

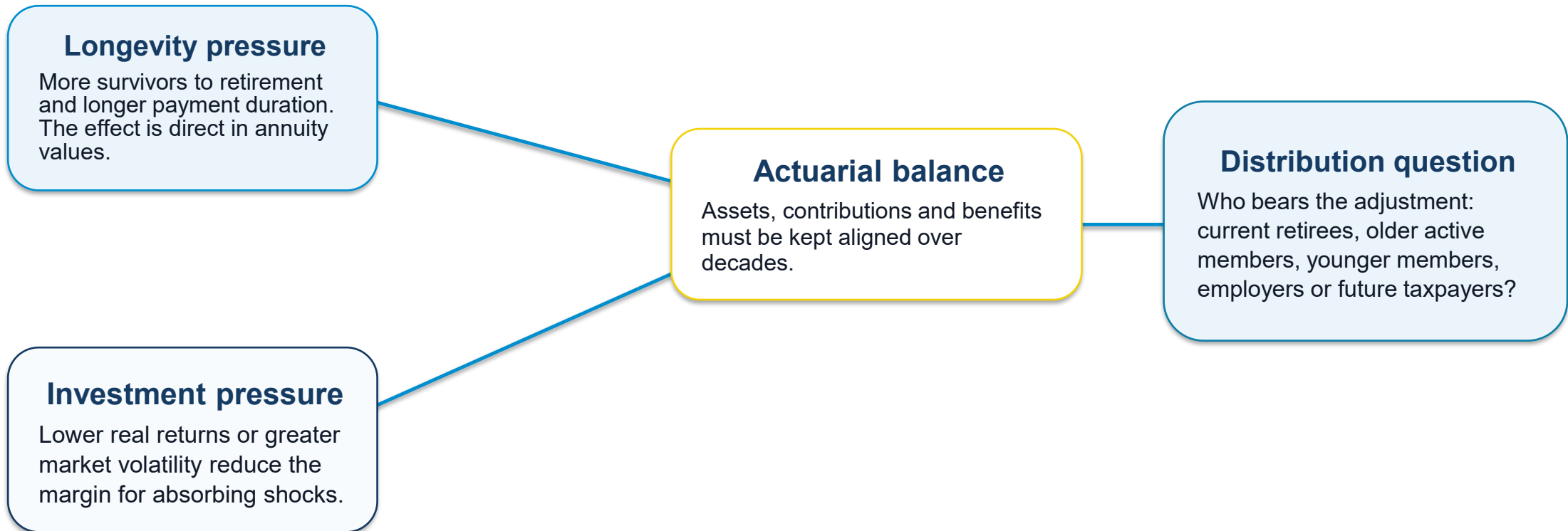
# The 2014 adequacy question has changed

The 2014 adequacy report asked whether pension savings would be enough. The updated question is whether the adjustment mechanism remains fair and credible.



Sources: 2014 pension adequacy report; updated mortality tables and 2038 projection factors supplied by the Actuarial Association of Iceland (FÍT)

# Two pressures dominate the sustainability test



**The actuarial calculation is simple; the social choice is not.**

# Investment challenge: from domestic concentration to global risk exposure



Foreign diversification is necessary in a small open economy — but it changes the risk package.

## Around 2014

- Domestic investment universe still dominant
- FX-linked investments about 24%
- High reliance on domestic bond markets

## Current / 2026 framing

- Foreign equities now the largest block
- More market, FX and liquidity risk
- Prudent-person governance becomes central

## Illustrative comparison of investment environment



Interpretation: the grey areas are residual “other” assets/cash/unclassified items. The 2014 bands are approximate and not fully like-for-like with the current CBI asset table; they are meant to show the change in investment environment, not a precise portfolio decomposition.

**Bottom line: the old challenge was domestic reinvestment and concentration; the current challenge is global market exposure, FX risk and liquidity under stress.**

Source anchor: 2013/2014 pension-fund supervision material and Central Bank of Iceland financial-stability / pension-fund balance-sheet data. Figures rounded.

# Mortality comparison: 2014, 2026 and 2038

PV of a unit annual pension from age 67, indexed to the 2014 mortality basis = 100



## Headline result

From the 2014 basis to the 2038 projection:

Males: about +17%  
Females: about +10%

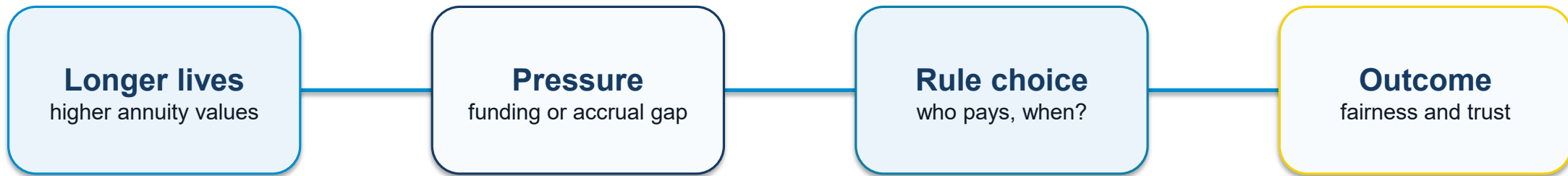
## Interpretation

This is not a forecast of fund deficits. It is the price tag of a longer expected pension-payment period before any benefit-design response.

Average across current ages 30, 40, 50 and 60

Calculation: annual payments in advance from age 67; 3.5% discount rate; 2007-2011, 2018-2022 and 2038 projected mortality intensities.

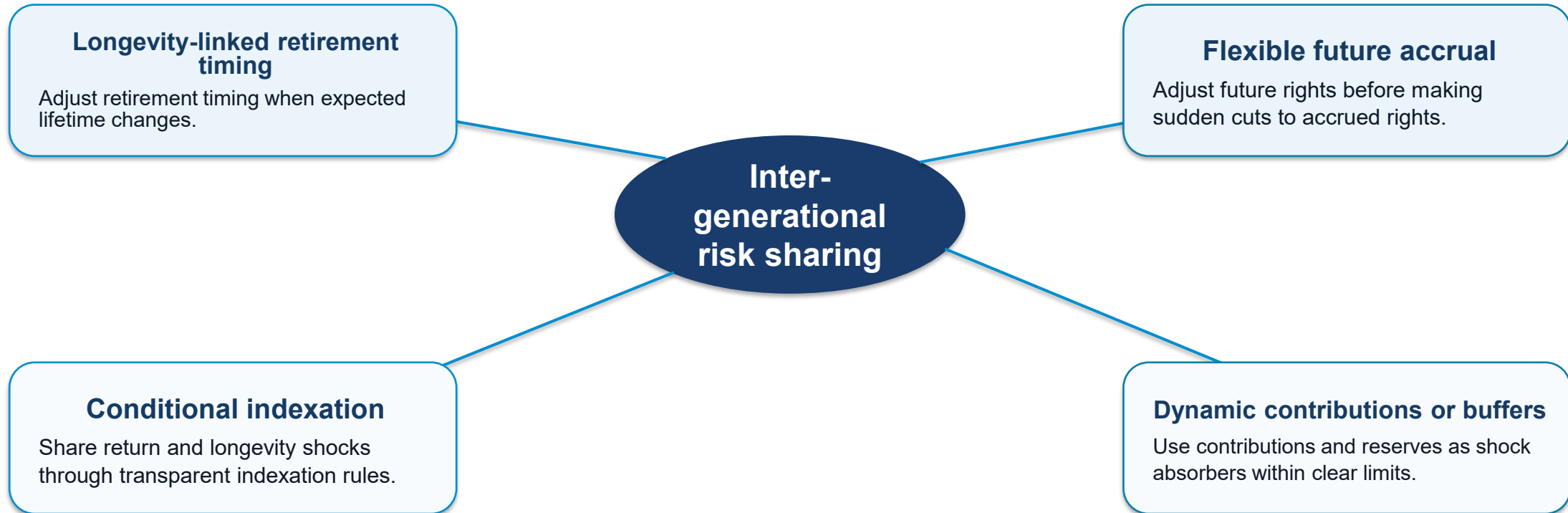
# What the liability result means for sustainability



- If adjustment rules are implicit, shocks emerge as ad hoc rights cuts or contribution pressure.
- If adjustment rules are explicit, members can understand the risk-sharing contract in advance.
- The actuarial job is to quantify not only the shock, but also the cohort incidence of the response.

# Adaptive benefit design: four levers

The goal is predictable and fair adjustment



Comparable mechanisms: Denmark, Netherlands and Sweden; adaptation to Icelandic fund rules would require domestic legal and governance choices.

# Recap

1

## **The Icelandic pension system is strong, but not automatically resilient**

High funding and large assets are a strength, but not a substitute for clear adjustment rules.

2

## **Longevity is already material**

The move from a 2014-style mortality basis to a 2038 projection raises pension liabilities materially.

3

## **Comparison gives tools, not templates**

Denmark, Netherlands and Sweden point to mechanisms Iceland can adapt: timing, contract design and balancing rules.

**A good funded system still needs a good rulebook.**

# Thank you

- Questions and discussion

Sigurður Freyr Jónatansson  
Central Bank of Iceland

# Appendix: detailed liability factors

Present value factors at current age for a unit annual pension from age 67

| Sex    | Age | 2014  | 2026  | 2038  | 2038 vs 2014 |
|--------|-----|-------|-------|-------|--------------|
| Male   | 30  | 3.13  | 3.35  | 3.69  | 17.8%        |
| Male   | 40  | 4.46  | 4.77  | 5.24  | 17.5%        |
| Male   | 50  | 6.39  | 6.83  | 7.47  | 17.0%        |
| Male   | 60  | 9.36  | 9.97  | 10.80 | 15.4%        |
| Female | 30  | 3.59  | 3.71  | 3.97  | 10.5%        |
| Female | 40  | 5.09  | 5.26  | 5.61  | 10.3%        |
| Female | 50  | 7.25  | 7.49  | 7.96  | 9.9%         |
| Female | 60  | 10.48 | 10.79 | 11.40 | 8.8%         |

Assumptions: annual advance payments from age 67, discount rate 3.5%, old table extrapolated to age 119, 2038 projection closes at age 110.

# Appendix: calculation logic

## Liability measure

$PV_x = \text{sum from } y=67 \text{ to } \omega \text{ of } v^{(y-x)} * p_x(y-x)$

Annual pension = 1; first payment at exact age 67.

## Mortality bases

2014: 2007-2011 mortality table

2026: 2018-2022 mortality table

2038: 2018-2022 intensity multiplied by 2038 factors