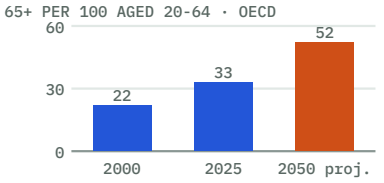
Who pays for your old age?

Pension = the money you live on once you retire (stop working). Two kinds: pay-as-you-go and funded; the dependency ratio; starting early; where the pot comes from; the employer match; present bias and automatic enrollment.

1 Pay-as-you-go

today pays today

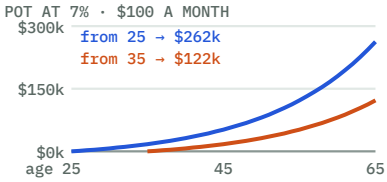
- **Pay-as-you-go**: "a pension system where today's workers' contributions pay today's pensioners" → no pot kept for you · most public pensions
- **Old-age dependency ratio**: "how many people aged 65+ there are for every 100 of working age (20-64)" · OECD (club of rich countries) average: **22** (2000) → **33** (2025) → **52** (2050, projected) · *Pensions at a Glance 2025*
- Workers per pensioner `100 ÷ 33 ≈ 3` → `100 ÷ 52 ≈ 2` ⇒ fewer workers pay each pension
- 3 levers: higher contributions · lower pensions · later retirement age → which one = a political choice; the numbers: something has to give
- Practice: 100 workers, 25 pensioners × $20,000 = $500,000 → **$5,000** a worker · 50 pensioners → **$10,000** a worker, or $500,000 ÷ 50 = a **$10,000** pension



2 Funded

a pot with your name

- **Funded pension**: "a pension paid out of a pot built from your own contributions and their investment growth" → pension fund · compound interest (Lesson 2)
- $100 a month, 7% a year after inflation (real rate, Lesson 5), until 65: Maya from **25** → **$262,481** · Leo from **35** → **$121,997** ⇒ **2.15×** · from 45 → ≈ $52,000
- Each 10 years later ≈ halves the pot · the early years grow the longest
- Practice: pot grows in step with the monthly amount ($100 → $122,000, $200 → $244,000) ⇒ Leo needs **$225** a month → $274,493 · paid in **$81,000** against Maya's $48,000



3 Where the pot comes from

money or growth?

- Maya paid in `$100 × 12 × 40 = $48,000` · pot $262,000 → growth `$262,000 − $48,000 = $214,000` ≈ **80%** of the pot
- ⇒ starting early: most of the pot is built by the money itself
- Rounded, made-up numbers: a steady 7% is an **average** · actual returns vary year to year (stocks about −37% in 2008, Lesson 6)

4 Employer match

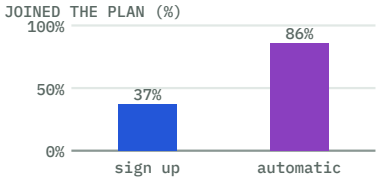
free money, with a catch

- **Employer match**: "extra money an employer pays into your pension when you pay in"
- $1 for each $1, up to $100 a month → she pays $100, the pot gets **$200** ⇒ instant return **100%** · catch: usually locked until retirement age
- Practice: pay $3,000 a month, 50 cents per $1 on up to 6% → `6% = $180` + match **$90** = $270 ⇒ **50%** · at 3%: misses $45 a month = **$540** a year · at 10%: match still $90 (the limit)

5 Defaults

why people do not save

- **Present bias** (Behavioral Lesson 6): cost today, benefit decades away → putting it off
- **Default**: "what happens if you make no choice" · **automatic enrollment**: you are in unless you opt out (say no)
- US economists Brigitte Madrian and Dennis Shea, 2001, one large US firm → new workers (new hires) who joined: sign up yourself **37%** · automatic **86%**
- UK automatic enrollment from 2012: employees who qualify, in a workplace pension **55%** → **87%** (2018, Dept. for Work and Pensions)
- Practice: take the default away → joining takes a form → put off → fewer join



6 Each system's risk

neither is risk-free

- Pay-as-you-go ← how many workers per pensioner (dependency ratio) · funded ← how the investments do (markets)
- Maya: starts at 25, lets the match and the years work · your own age: your choice, not graded

Watch out: "a funded pot grows 7% every year" × (7% is an average) · "starting 10 years later loses 10 years of payments, a quarter" × (it loses more than half the pot) · "under pay-as-you-go my money is saved for me" × (it pays today's pensioners)

This is a lesson, not financial advice. It shows what the evidence says about choices like these; what is right for you depends on your life.