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# Collective Defined Contribution pension schemes in the UK

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## For UK CDC schemes,

- What are the key features?
- How does scheme design affect intergenerational risk-sharing?
- What are the key risk management considerations?





## *UK pension system*

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- Pillar 1:
  - Pay-as-you-go system.
  - “Basic State Pension” of ~£12 000 p.a.
    - Current minimum wage ~£25 000 p.a.
    - UK median wage ~£36 000 p.a.
  - Contribute based on earnings between two thresholds.
    - About 35 years of contributions needed to get full Basic State Pension.
- Pillar 2:
  - Funded occupational pension plans.
  - Defined benefit pension schemes in decline,
    - 4% of private sector schemes open to new members in 2024.
  - Defined contribution main alternative.
  - Minimum total contribution rate of 8% of salary.

# More and more people saving into DC pensions

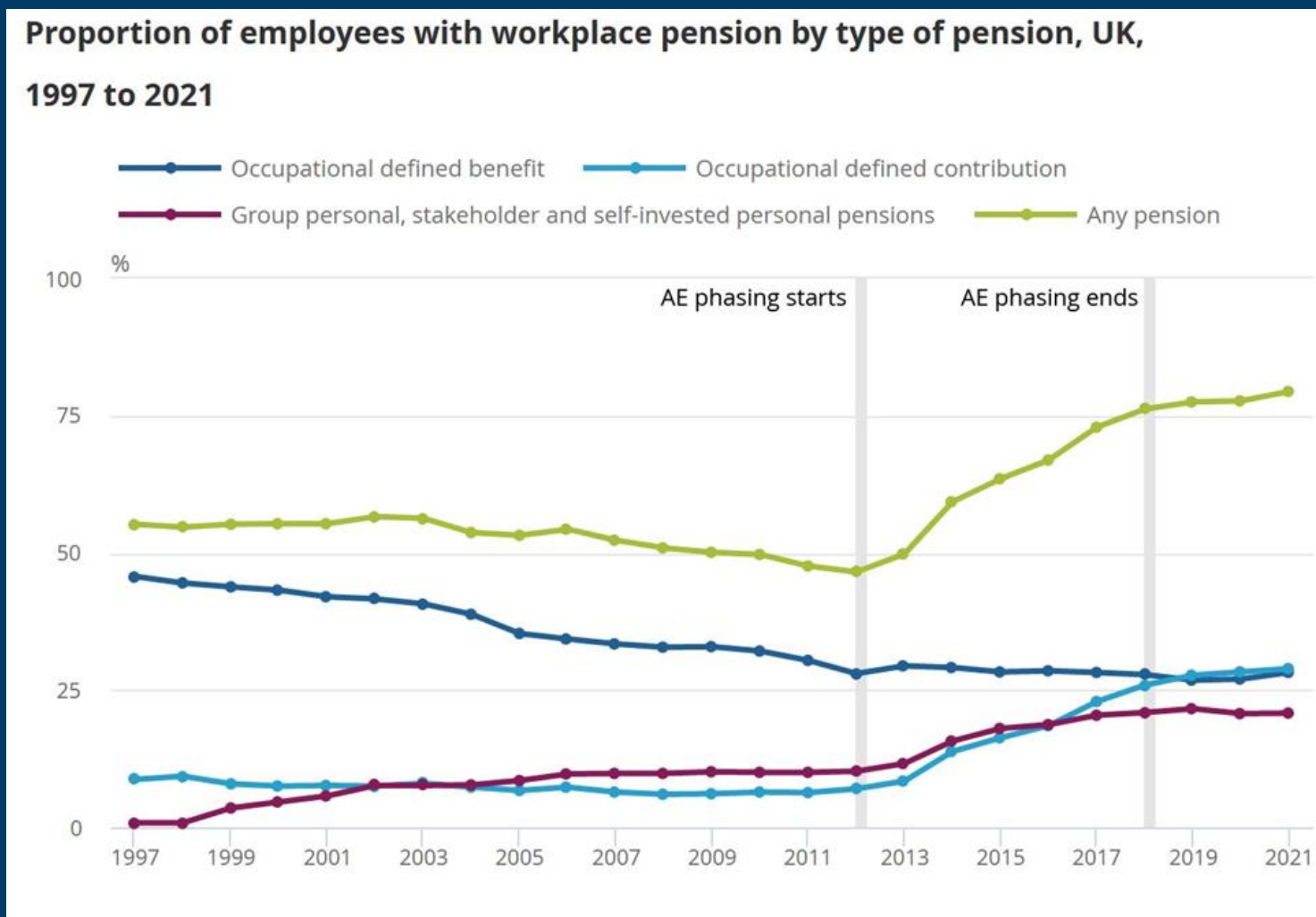


Figure from ONS:

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/workplacepensions/bulletins/annualsurveyofhoursandearningspension/tables/2021provisionaland2020finalresults>

# Public sector workers in DB schemes, Private sector in DC-type

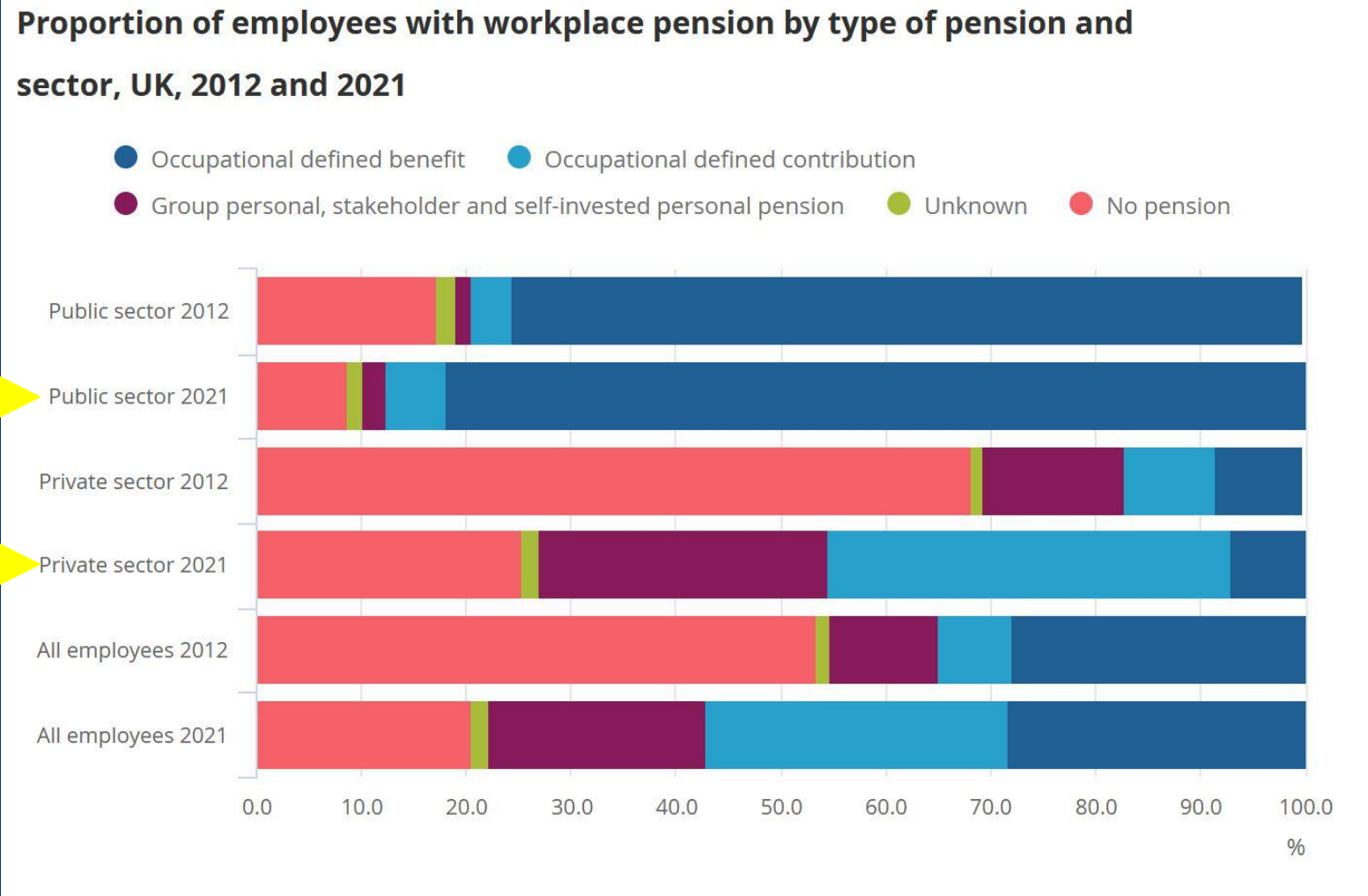


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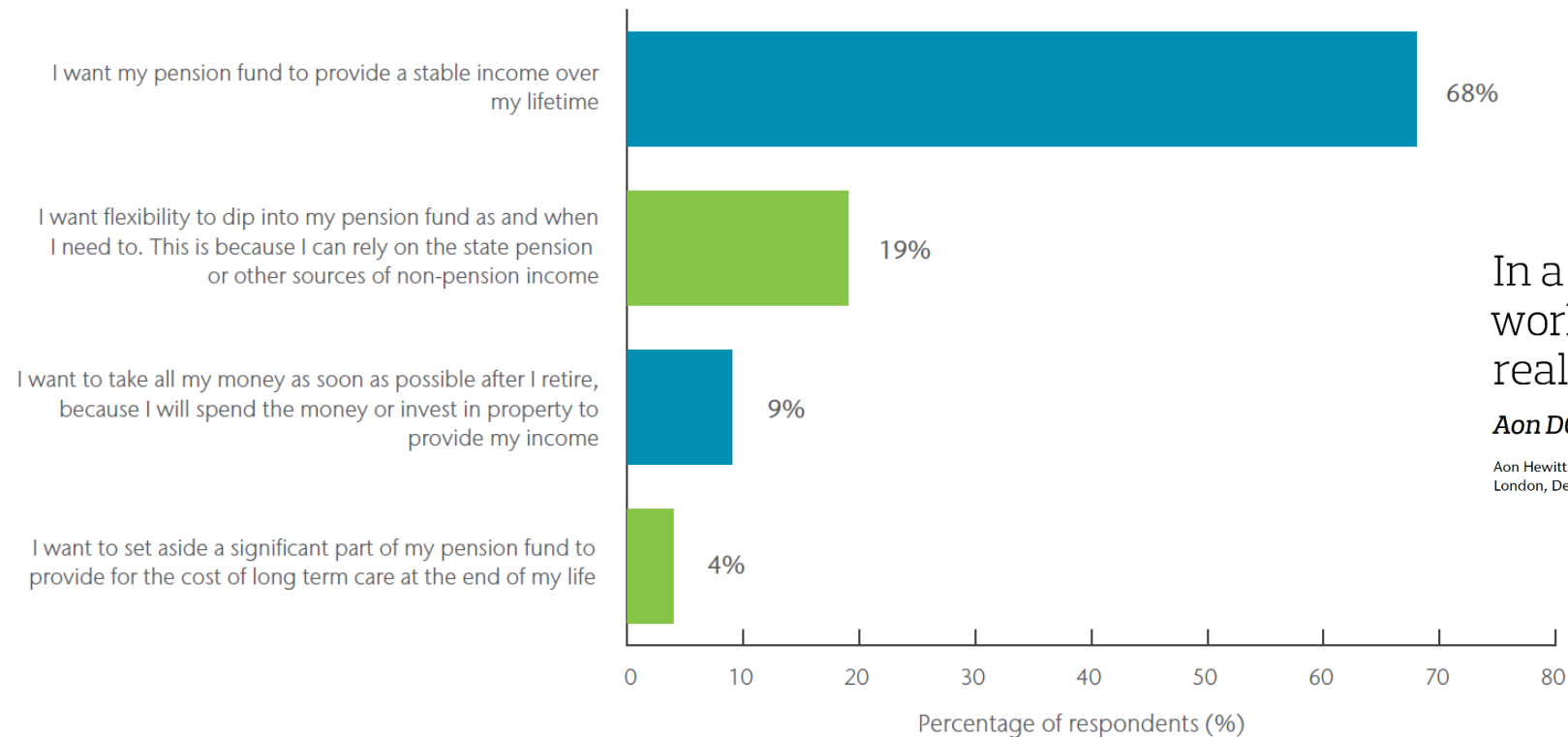


# *“I want my pension fund to provide a stable income over my lifetime”*



**Chart 9 – Using retirement savings**

*Which of the following statements best describes your attitude towards how you might spend your pension fund?*



In a brave new pensions world what will DC members really want?

**Aon DC Member Survey**

Aon Hewitt and Cass Business School  
London, December 2014

# Decumulation options from Pension Wise

## Life annuity, or Income drawdown



### ☐ Retire later or delay taking your pension pot

*You don't have to take your pension money at your 'selected retirement age' – the age you agreed with your provider to retire. You can leave your pension invested and take it when you're ready.*

### ☐ Get a guaranteed retirement income (annuities)

*You can use your pension money to buy an insurance policy which gives you a guaranteed income for life or a fixed number of years. You can take up to 25% of your pot tax free before you buy an annuity.*

### ☐ Get a flexible retirement income (pension drawdown)

*This option allows you to decide how much pension money to take and how long you want it to last. You can take some of your money as cash – up to 25% is tax free. The rest is invested to give you a taxable income.*

### ☐ Take your pension as a number of lump sums

*This option allows you to decide how much pension money to take and when to take it. Your pot stays invested and you take small lump sums over time until it runs out – 25% of each amount you take out is tax free.*

### ☐ Take your whole pension in one go

*You can take your whole pension pot as cash – 25% is tax free and the other 75% is taxed along with any other income you have, e.g. from work, savings or investments.*

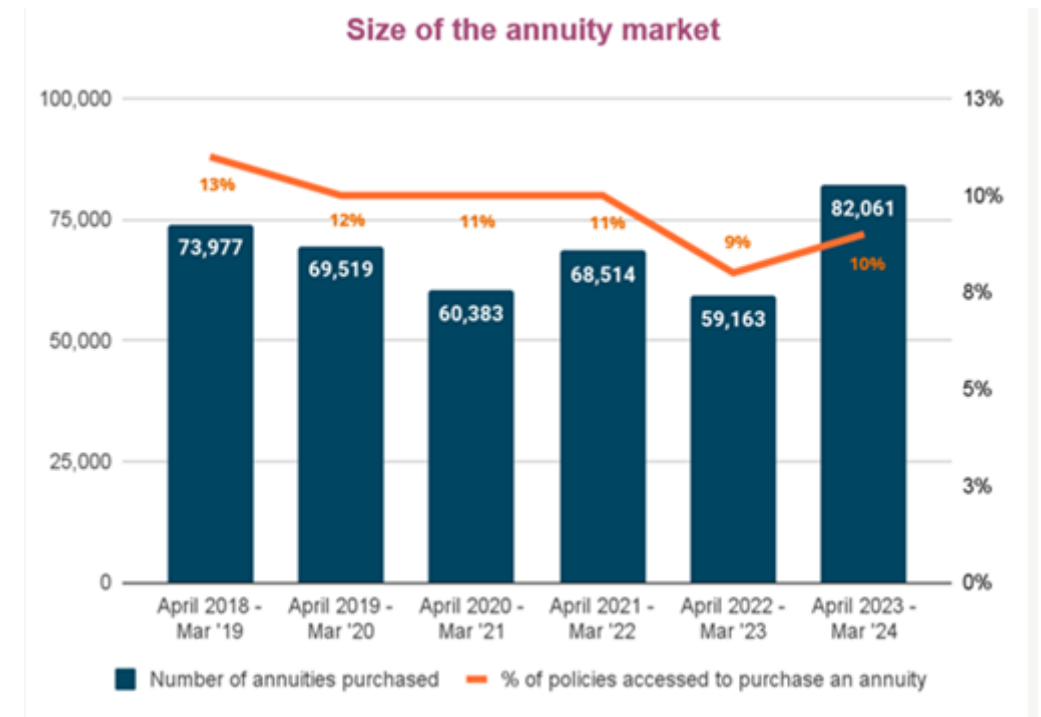
### ☐ Mix your options

*You can mix your options, e.g. use some of your pension to get a flexible income and some to buy an annuity. If you have more than one pot, you can choose different options for each one, e.g. delay taking one pot and take a number of lump sums from another.*



## *Life annuity – guaranteed income seen as expensive*

- Individual annuity sales have increased with rising interest rates
  - 89,600 contracts sold in 2024.
  - Around 10% of pension pots accessed to buy an annuity.



Source: Association of British Insurers (ABI)



# Income Drawdown highly complex

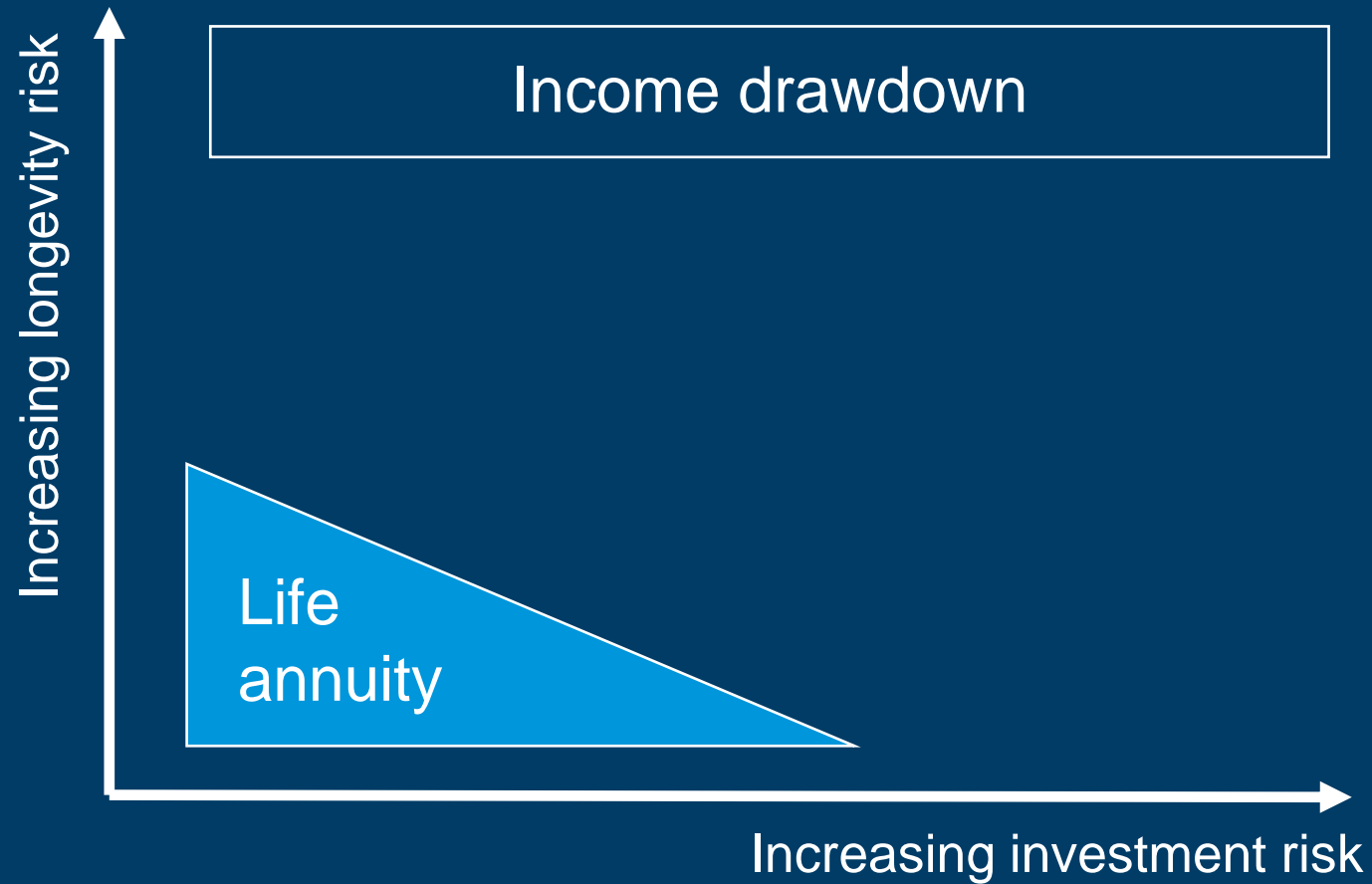
		Income % per annum								
		2	2.5	3	3.5	4	4.5	5	5.5	6
Term years	15	100%	100%	100%	100%	100%	100%	99%	97%	91%
	20	100%	100%	100%	100%	98%	95%	84%	66%	41%
	25	100%	100%	99%	97%	91%	77%	51%	28%	12%
	30	100%	100%	98%	92%	75%	49%	28%	12%	5%
	35	100%	98%	94%	82%	56%	33%	14%	6%	2%

\*As at 30 June 2018.  
All values calculated using a 1% AMC and invested in Governed Retirement Income Portfolio 3 (GRIP3).

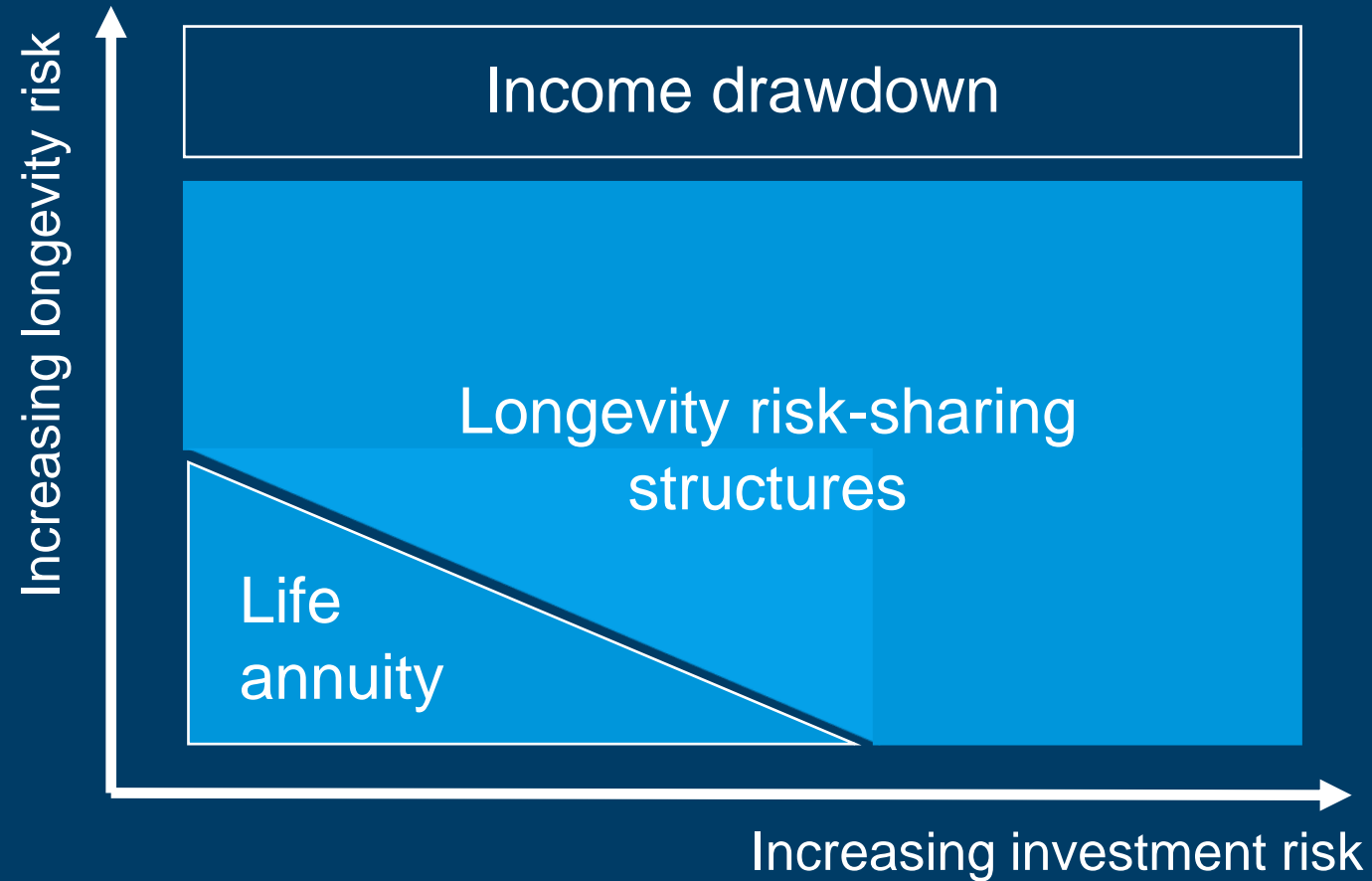


Source: Royal London via Innes Reid, <https://innesreid.co.uk/over-half-of-drawdown-pensioners-risk-running-out-of-money/>

## *Decumulation from a retiree's point-of-view*



## *Decumulation from a retiree's point-of-view*

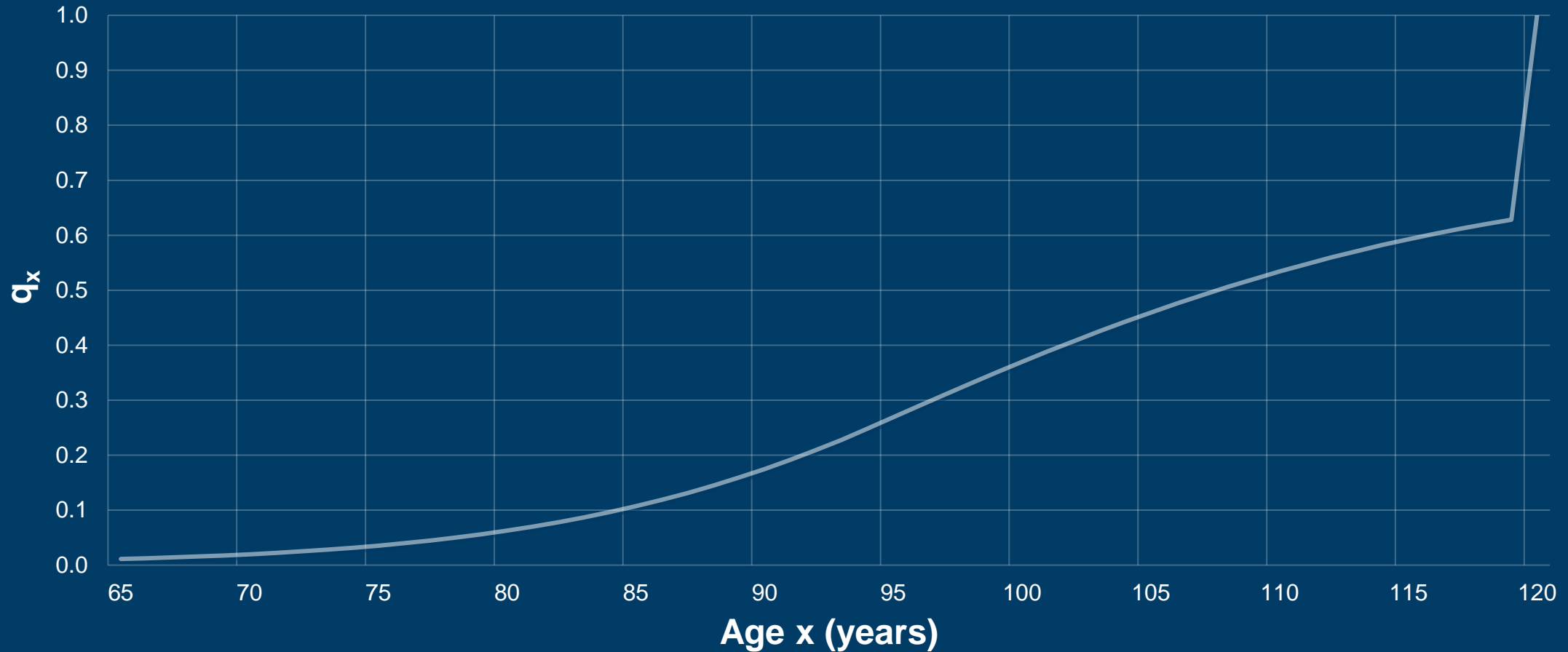




*Additional annual return due to sharing longevity risk*  
 $\approx$  Annual chance of death



## ANNUAL PROBABILITY OF DEATH FOR TABLE S1MPA

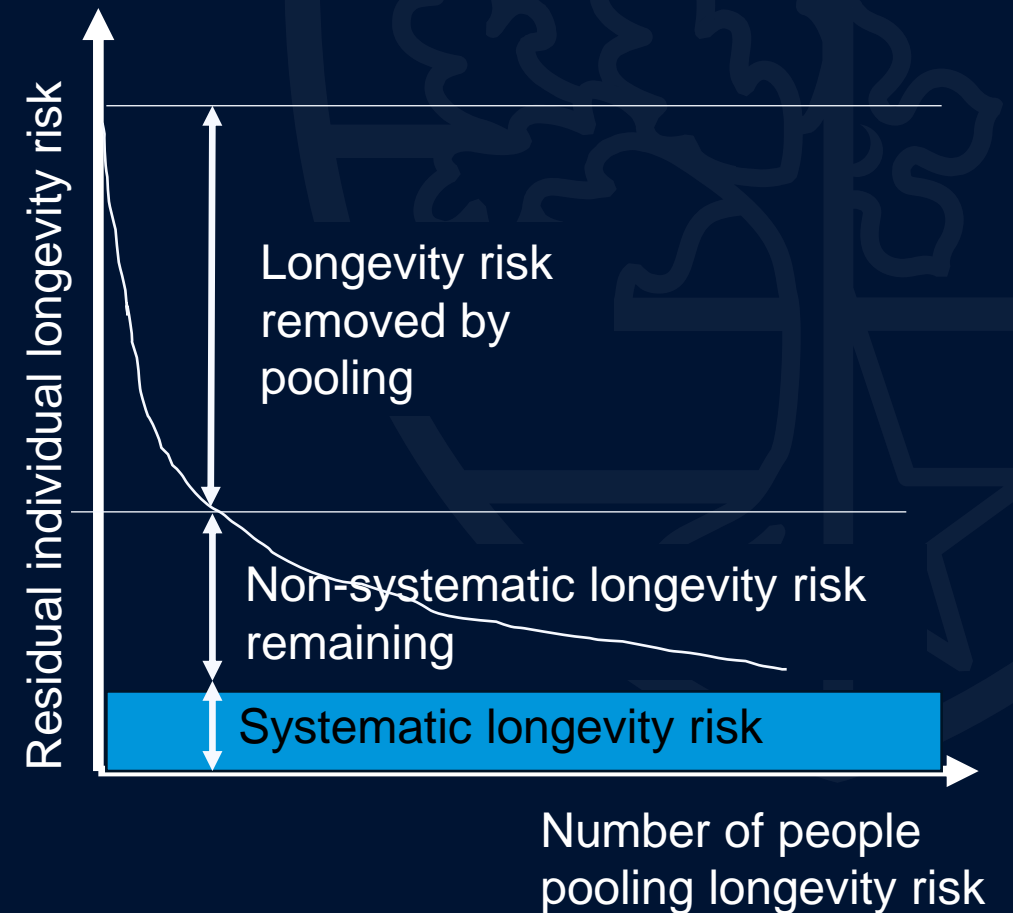




In risk-sharing structures,

**Most of longevity risk is diversifiable**


*Investment risk is not diversified by pooling*





# Royal Mail staff vote to strike over pensions

🕒 3 October 2017



Royal Mail, which has 142,000 employees in Britain, reached an agreement over pensions, pay, a shorter working week, culture and operational changes, it said in a statement.

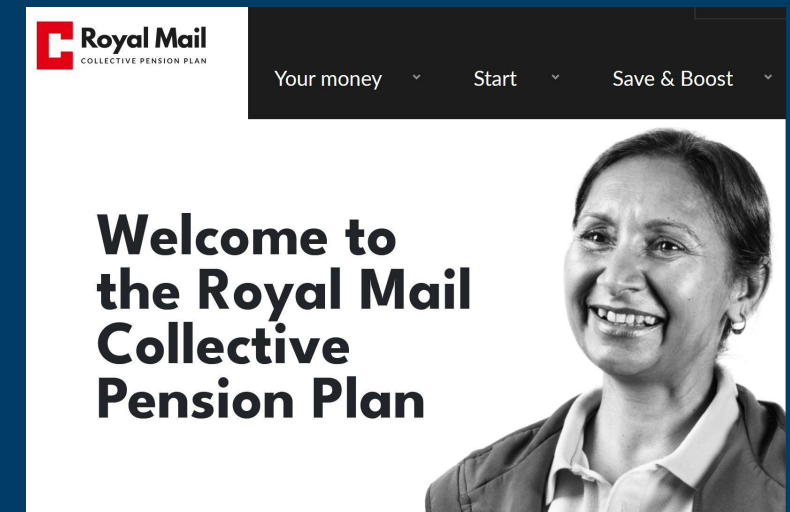
Royal Mail said it and the CWU would lobby government to make necessary legislative and regulatory changes so a CDC scheme could be set up.



*“Royal Mail and CWU went back to the fundamentals of what they wanted:*



1. Predictable costs for the company within its budget.
2. Investing the contributions in mainly return-seeking assets to aim to generate good levels of retirement savings over the long term.
3. Providing the savings in the form of a pension.”



## *Royal Mail Collective Pension Plan*

- Pension accrual rate of 1/80 of salary.
  - Includes spousal and children contingent pension benefits.
  - Contribution rate 15.2% of salaries.
- Lump-sum-on-retirement accrual rate of 3/80 of salary.
  - Lump sum guaranteed never to decrease by Royal Mail.
  - Contribution rate 4.1% of salaries.



Your money ▾

Start ▾

Save & Boost ▾

# Welcome to the Royal Mail Collective Pension Plan





In CDC schemes, benefits adjust to ensure 100% funding position

Scheme type	Contribution levels	Benefit levels	Who bears the risk?	Who decides the level of risk?
Defined contribution (DC)	Fixed	Vary	Members	Whoever chooses the default fund
Collective Defined Contribution (CDC)	Fixed	Vary	Members	Trustees (and members?)
Defined Benefit (DB)	Vary	Fixed	Employers	Employers and trustees



## 100% funding position

- In CDC schemes, benefits adjust to ensure 100% funding position.

- Annually determine the pension increases so that

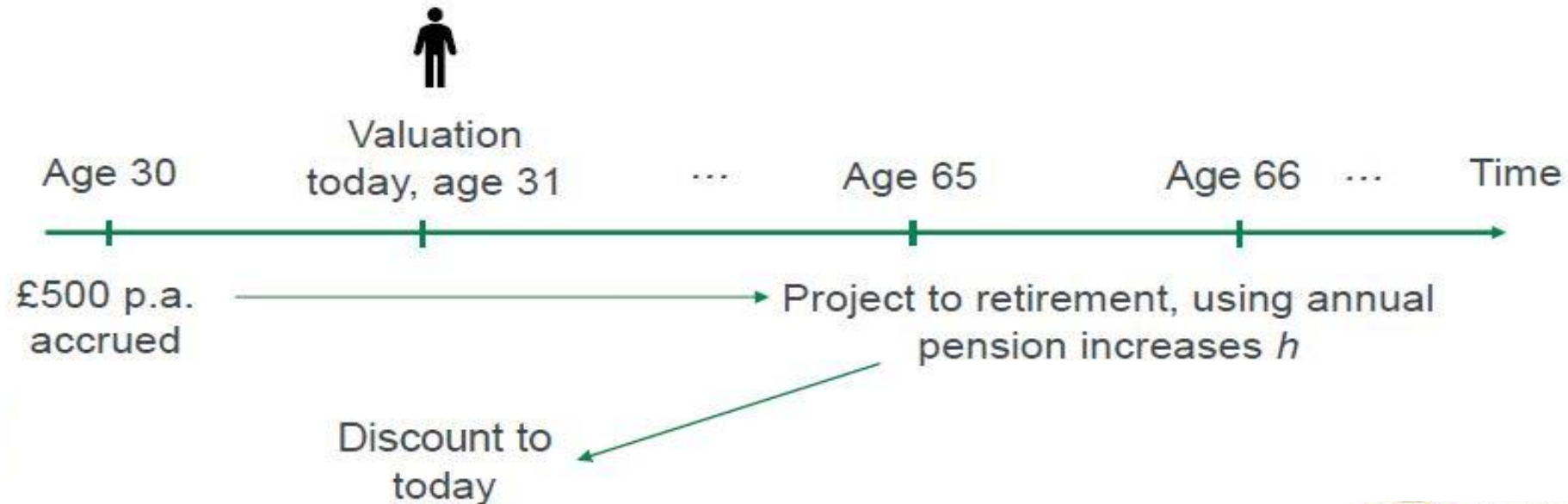
Asset value

= Discounted benefit value.



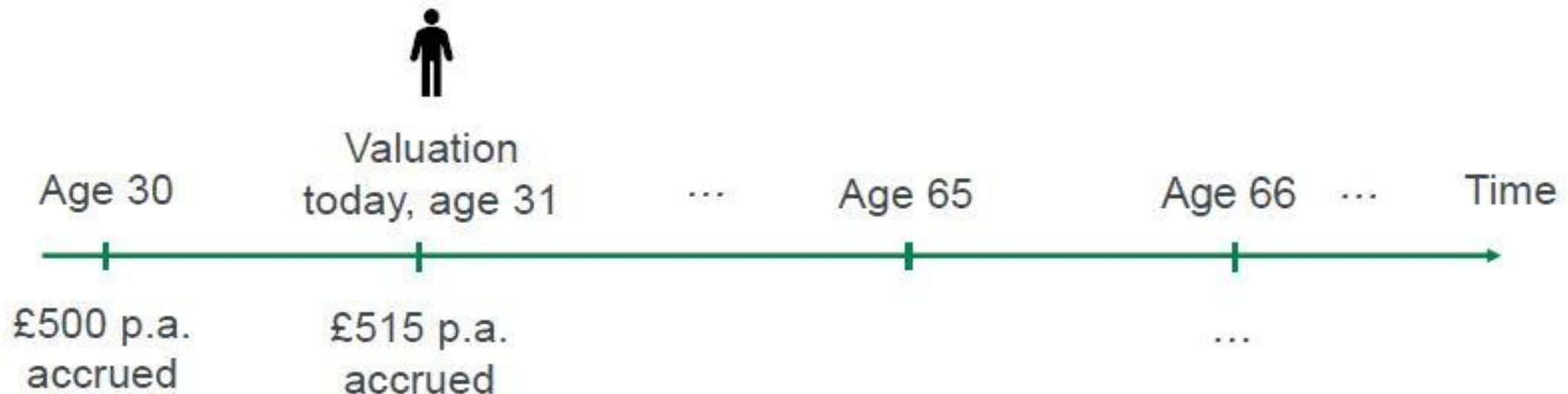
## Risk-sharing mechanism

- The annual pension increase granted must be the same for all members
  - Two types: annual indexation and one-off.
- e.g. annual indexation increase of  $CPI+h$ .
  - Use  $\{CPI_t+h\}_t$  to project annual pension amount into retirement.
  - If  $CPI_{\text{today}}+h$  is too large or small, a one-off adjustment is applied to all benefit amounts today.



## Risk-sharing mechanism

- Suppose  $h^*=1\%$  p.a makes  
Total asset value = Total discounted projected accrued pensions.
- One-off adjustment not needed.
- Then if  $\text{CPI}_{\text{today}}=2\%$  p.a,  
This year's accrued pension =  $1.03 \times$  Last year's accrued pension.







## *Risk transfer from old to young*

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$\text{CPI}_{\text{today}} + h^* = 3\% \text{ p.a.}$

- Suddenly, the asset value falls by 10%.
- Everything else unchanged.
- The new  $\text{CPI}_{\text{today}} + h^*$  is re-calculated to be 2.4% p.a.
- The annual **amount** of each member's accrued pension goes up by 2.4%, instead of by 3%.
- How does the **discounted value** of each member's accrued pension change?



Under a fall in asset value of 10%,

Change in **discounted value** of individual benefits is

- Bigger than -10% for younger members,
  - Smaller than -10% for older members,
- i.e. a risk transfer from old to young.

Number of years to retirement	1 (Old)	...	20	...	39 (Young)
Change in discounted value	-5%	...	-15%	...	-25%



## Risk transfer summary

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### Annual indexation increases transfer risk...

- ...From the old to the young
  - Young have more volatile pension values, and
  - More volatile pension amount.
- This is the source of “pension smoothing” in CDC schemes.

### One-off increases transfer risk ...

- ...To all members uniformly.
- If all pension increases were one-off, there would be no pension smoothing.



## *Pension smoothing*

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- CDC schemes can take more investment risk for longer than individual DC schemes,
- While protecting older members from volatility in their pension payments.
- Who gives the protection? Younger members.
  - Consequently, younger members have more volatility in their pensions.



# Contributions

- In CDC schemes, benefits adjusted to ensure 100% funding position.

- At time 0, determine the pension increases so that

Asset value  $\mathcal{A}_0$

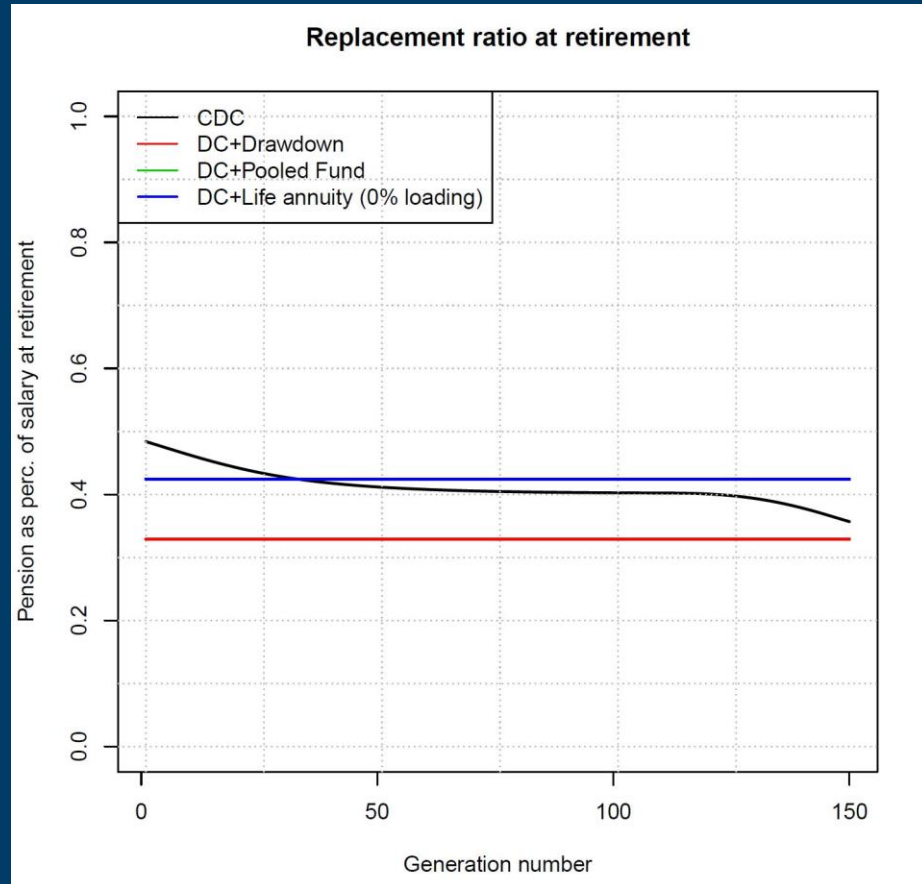
= Discounted benefit value  $\mathcal{L}_0$ .



## Contributions and financial fairness



- At the valuation date,  $\mathcal{A}_0 = \mathcal{L}_0$ .
- Immediately after it, compare:
  - Asset value =  $\mathcal{A}_0$  + New contributions,
- To:
  - Discounted benefit value =  $\mathcal{L}_0$  + New benefit accrual due to new contributions, on the valuation basis.
- If New contributions  $\neq$  New benefit accrual due to new contributions,  
the funding position  $\neq$  100% immediately after the valuation.



## Constant accrual and financial fairness

- Constant rate of pension accrual and constant contribution rate for all members cannot give financial fairness.
- Larger-than-expected pension increases may occur for the first generations in the scheme.
- Age-related pension accrual would mitigate this effect.
- Differences in contribution basis vs valuation basis may remain.

## Inter-generational cross-subsidies



#	What?	Who benefits?	How?
1	Risk transfer from old to young	Older members (arguably; depends on risk appetite)	Annual pension increases
2	First-joining generations subsidised by later generations	First-joining generations	Constant benefit accrual and constant contribution rate (as not financially fair)
3	Across time	Depends (but cumulative subsidy is calculable at each point in time)	Assumptions different to experience





## *Risk management framework*

- Members bear the full consequences of CDC scheme decisions.
- Some members bear more risk than others.
  - How much is due to scheme design?
  - Or due to chance?
- Scheme design is critical at controlling inter-generational risk transfers.
- Scheme objectives critical.
  - E.g. Royal Mail CPP has an objective to target a level of investment return that reflects its long-term nature;
  - There is no objective to give an inflation-linked income.
- Risk budget for members needs determined and compared to:
  - Intergenerational cross-subsidies,
  - Investment strategy and objectives,
  - Contributions,within a risk management framework.

# Thank you.

## References

- Research project '*Optimising Future Pension Plans: Phase II*', funded by the Institute and Faculty of Actuaries' Actuarial Research Centre. Project website: <https://www.actuaries.org.uk/learn-and-develop/research-and-knowledge/actuarial-research-centre-arc/current-research/optimising-future-pension-plans-phase-ii>
- Armstrong, J., Dalby, J., and Donnelly, C. '*Intergenerational cross-subsidies in UK collective defined contribution (CDC) funds*'. Working paper.



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