

# Longevity risk for pension schemes

## Measurement, management and mitigation



- Martin Potter
- 2 December 2011

managing DB risk

# Tailoring to Caribbean reality?



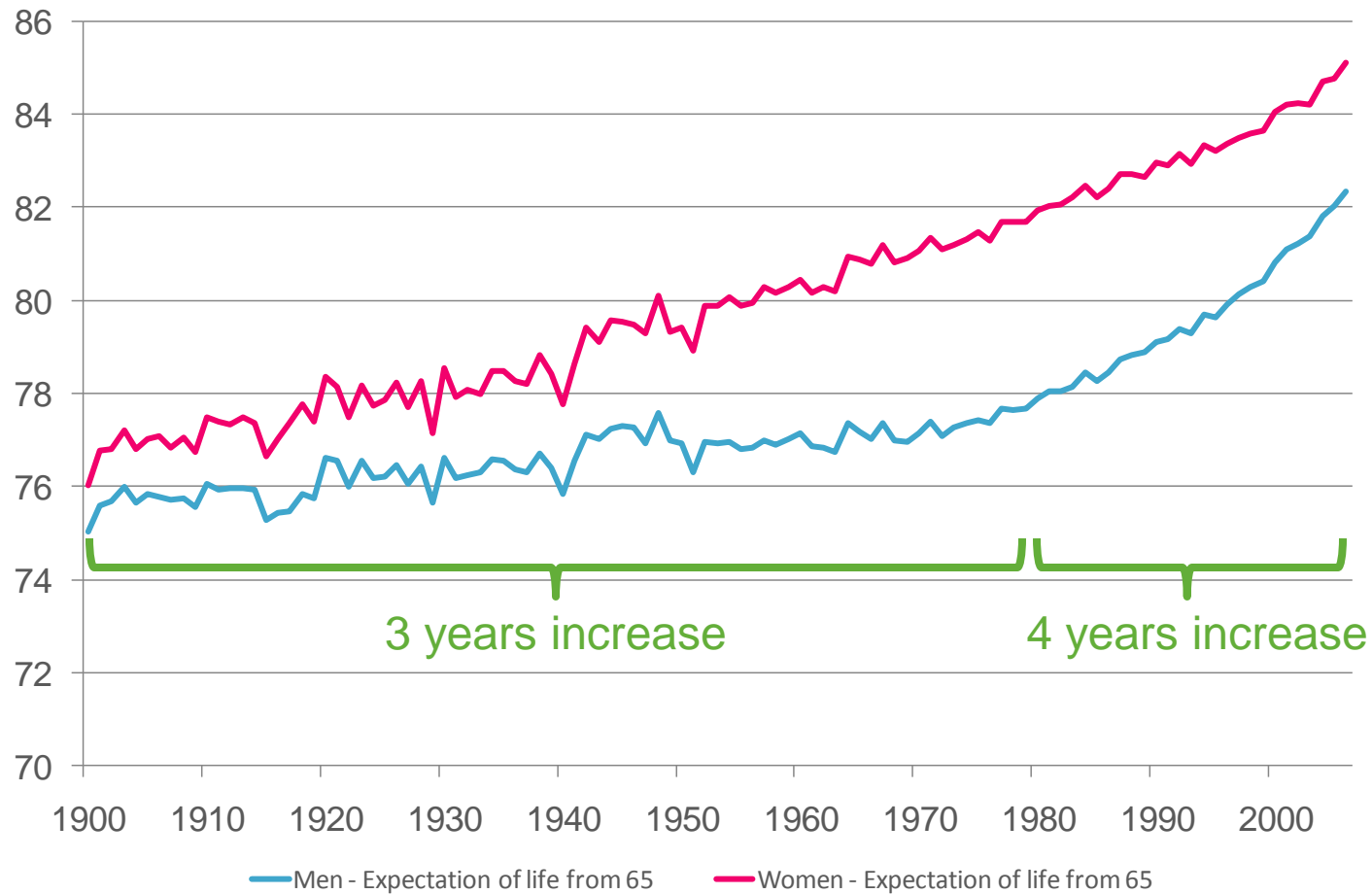
# Longevity risk - setting the scene

- Q1. How much has UK life expectancy improved in last 10 years?
- 1. 0.25 years
- 2. 0.5 years
- 3. 1 year
- 4. 2 years



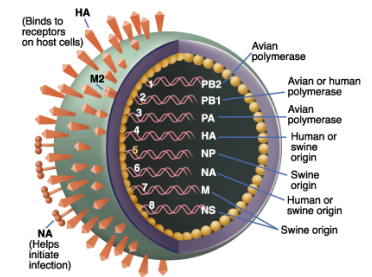
Jean Calment

# Life expectancy trends (65 year olds)



Source: Human Mortality Database ([www.mortality.org](http://www.mortality.org)), England & Wales data

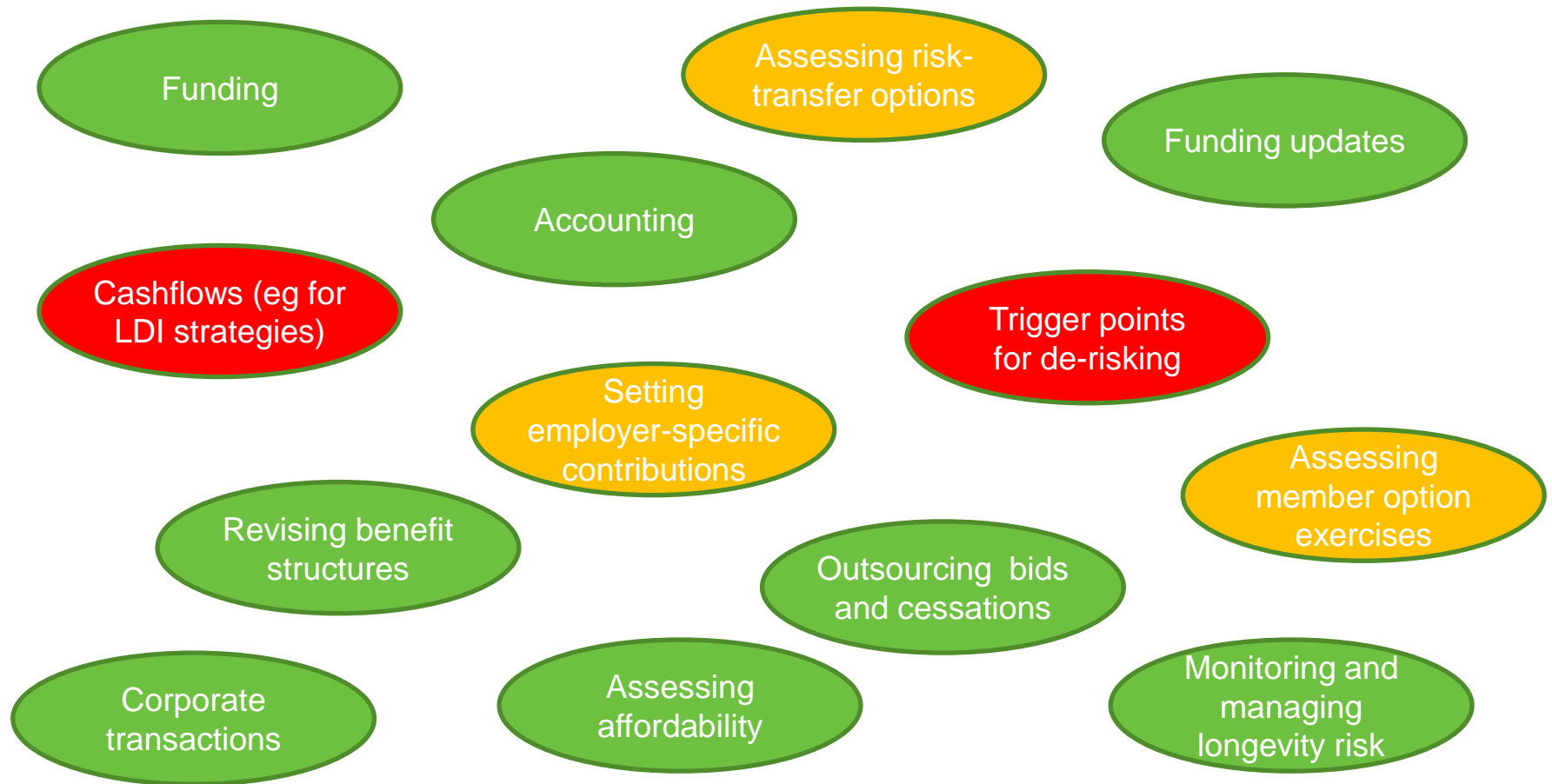
# Looking behind the trends



## What's the effect on pension schemes?

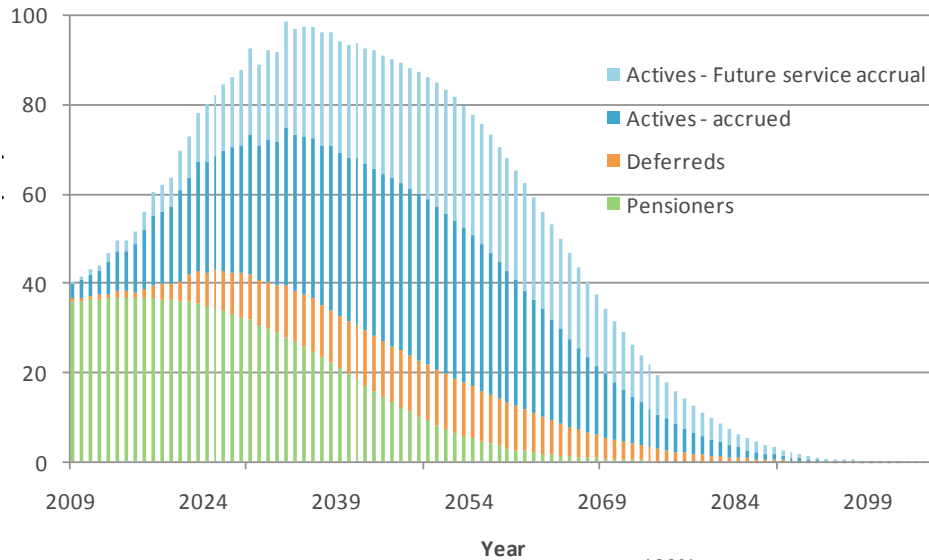
- Q2. What impact would a 1 year unexpected increase in life expectancy have on a \$1bn pension scheme's liabilities?
  1. \$3 million
  2. \$9 million
  3. \$30 million
  4. \$90 million

# Longevity is more than just a funding issue!



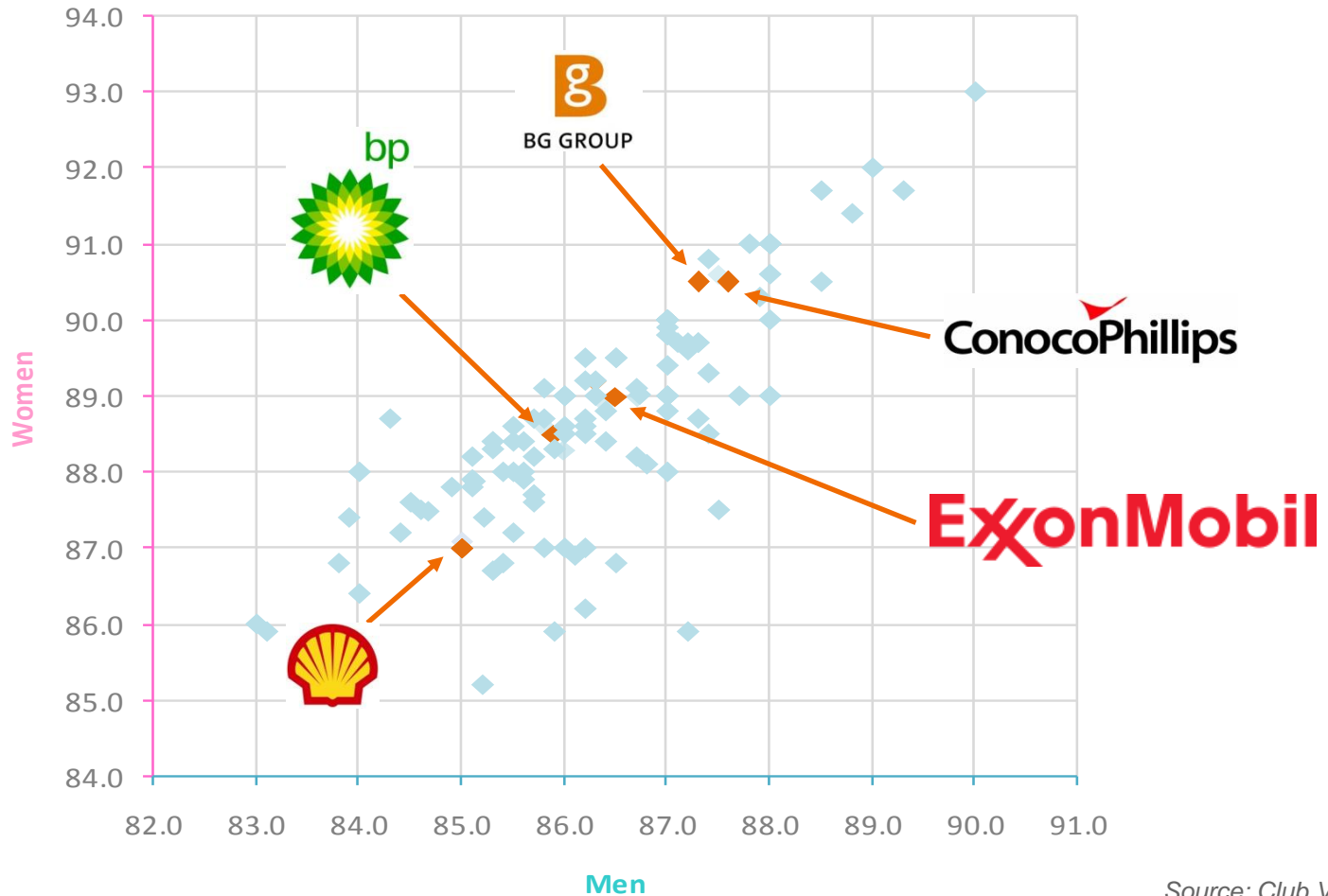
# Longevity underpins financial de-risking

**Projected benefit payments**



# Relative life expectancy assumptions

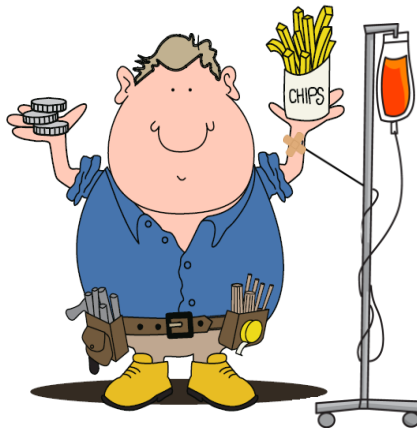
## Highlighting the oil and gas sector



Source: Club Vita analysis of IAS19 longevity assumptions

# Variation in individuals' life expectancy

## John



- Ill health retirement
- Low affluence
- Unhealthy lifestyle postcode
- Manual worker

## Jim



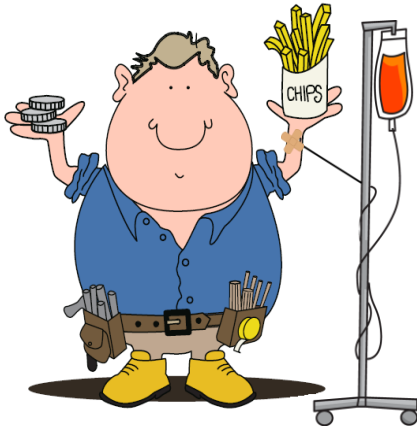
- Normal health retirement
- High affluence
- Healthy lifestyle postcode
- Non manual worker

## Variation in individuals' life expectancy

- Q3. By how many years might we expect Jim to outlive John?
  1. 3 years
  2. 6 years
  3. 9 years
  4. 12 years

# Variation in individuals' life expectancy

Life expectancy from 65: **10.9 years**



Life expectancy from 65: **22.8 years**

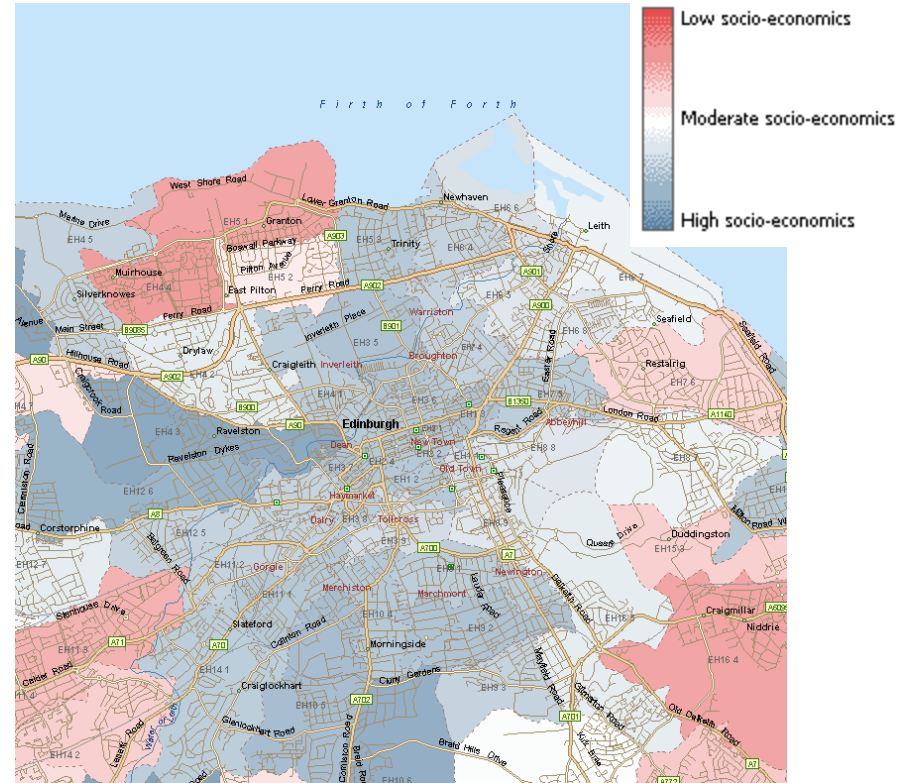
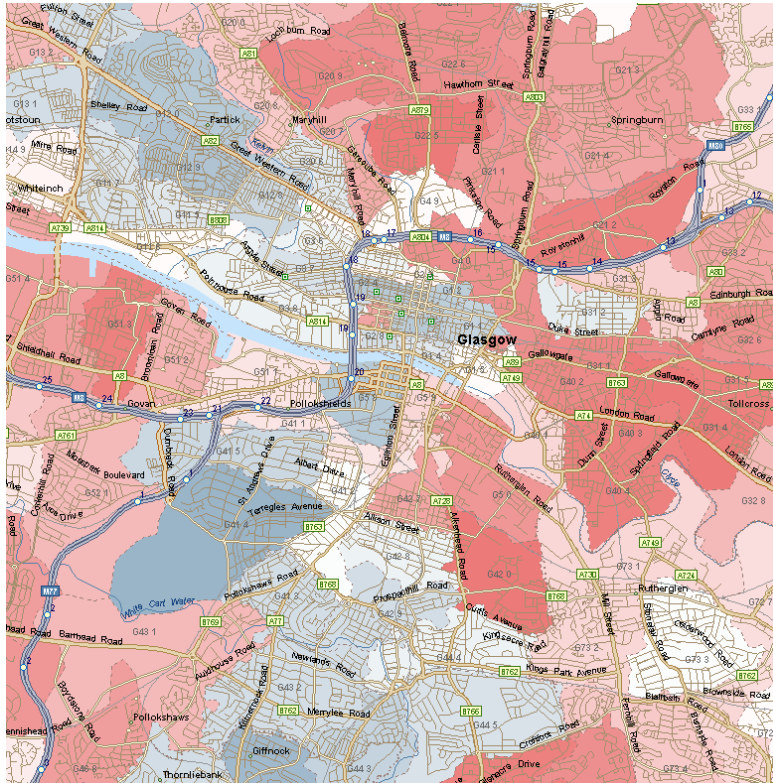


- Ill health retirement
- Low affluence
- Unhealthy lifestyle postcode
- Manual worker

- Normal health retirement
- High affluence
- Healthy lifestyle postcode
- Non manual worker

# Scotland's east/west divide

CLUB  VITA



**Example of Glasgow v Edinburgh socio-economics!**

## Basis risk -

### “How long are members living today?”

- Objective!
- Don't assume all members the same
  - Members profiles?
- Your scheme's own experience
  - Size? Concentration of risk? Changes in workforce?
- Other data sources
  - Size? Up-to-date? Robust? Tailored?

## Basis risk -

“How long are members living today?”

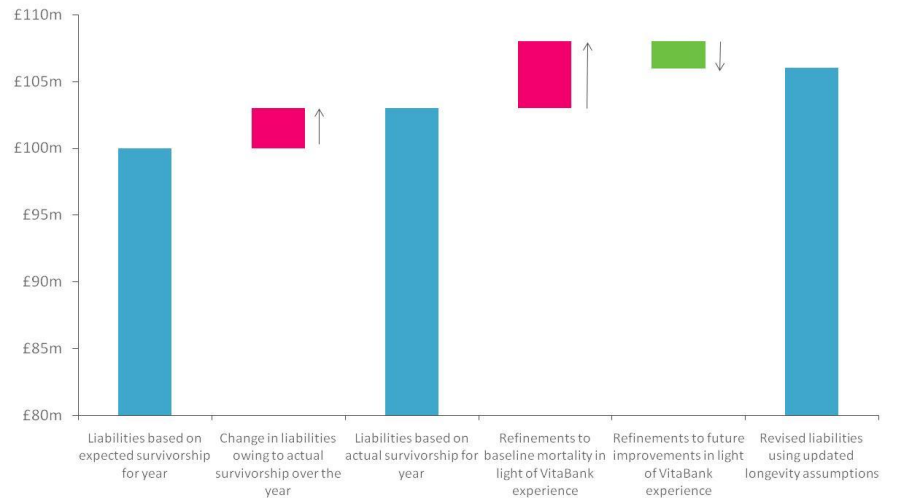
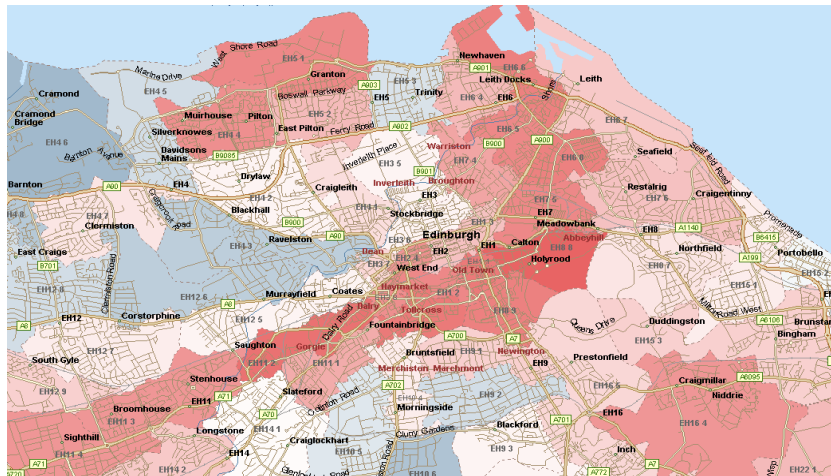
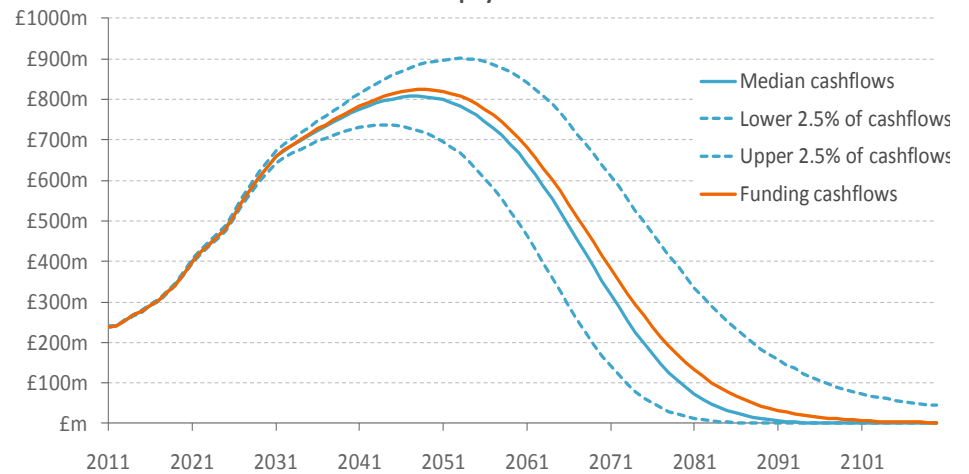
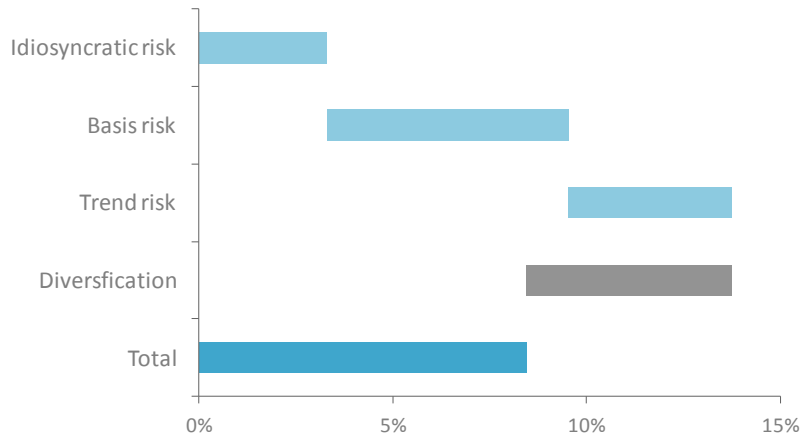
### Caribbean reality?

- Adjusting US, UK & Canadian standard tables
- Statistical credibility – by country, sector, scheme?
- Data quality

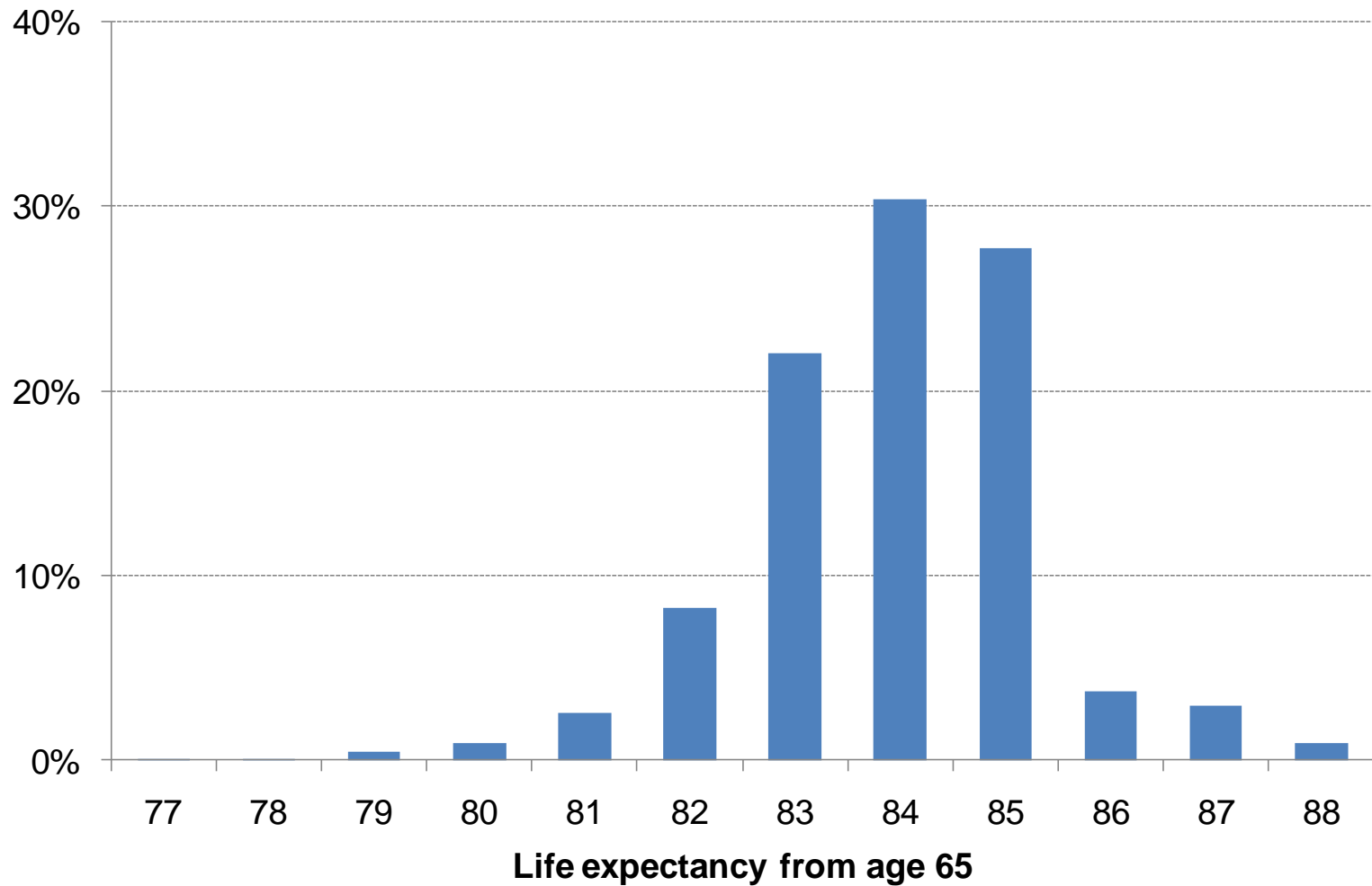
# Addressing the challenge: Taking ownership

- Understand *your* scheme's longevity risk
- Get your assumptions on track
- Monitor that your assumptions on track
- Treat longevity as a risk
- Manage within your risk framework

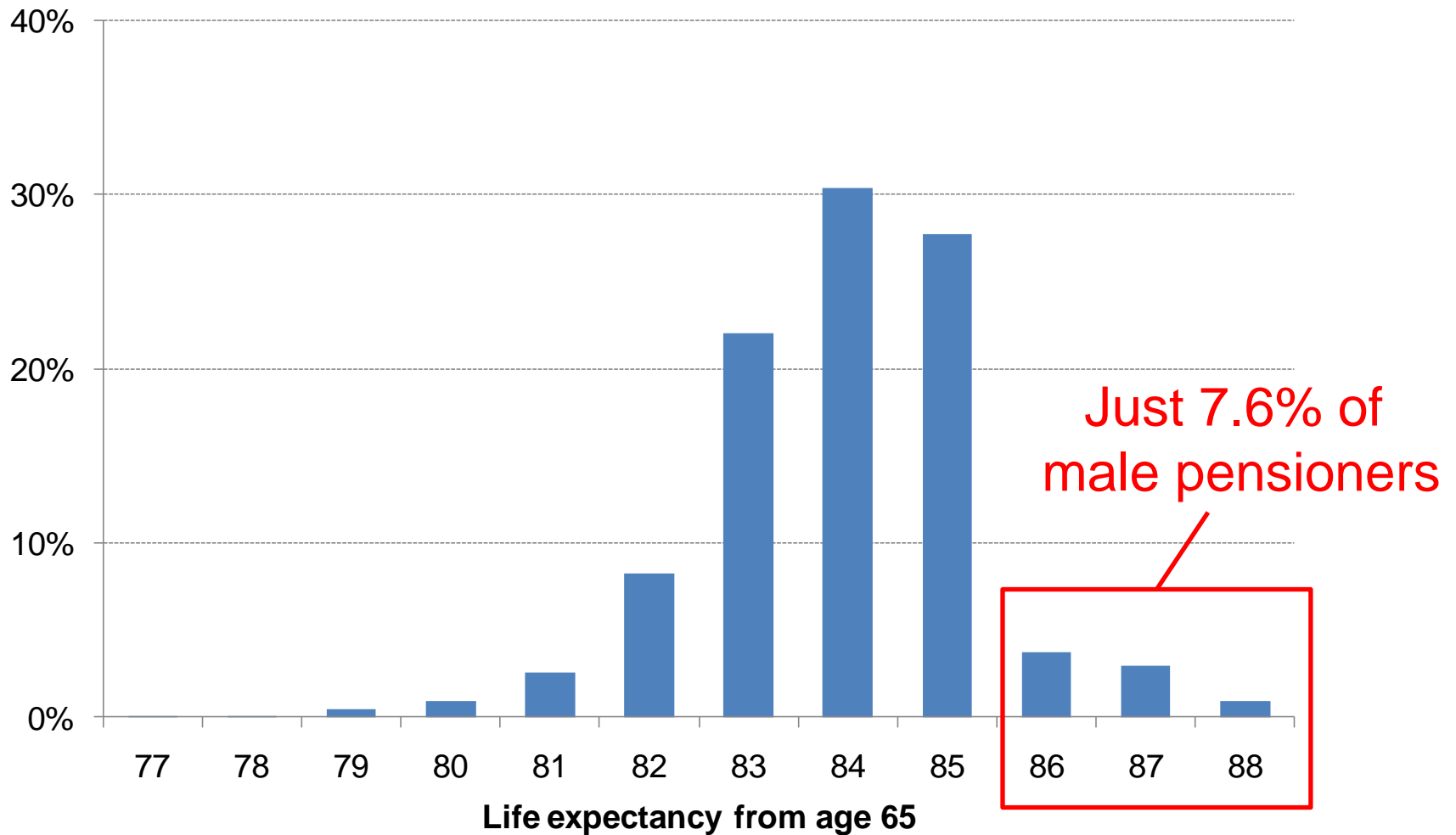
# Understanding the source of longevity risk



# Variation for individuals - idiosyncratic risk



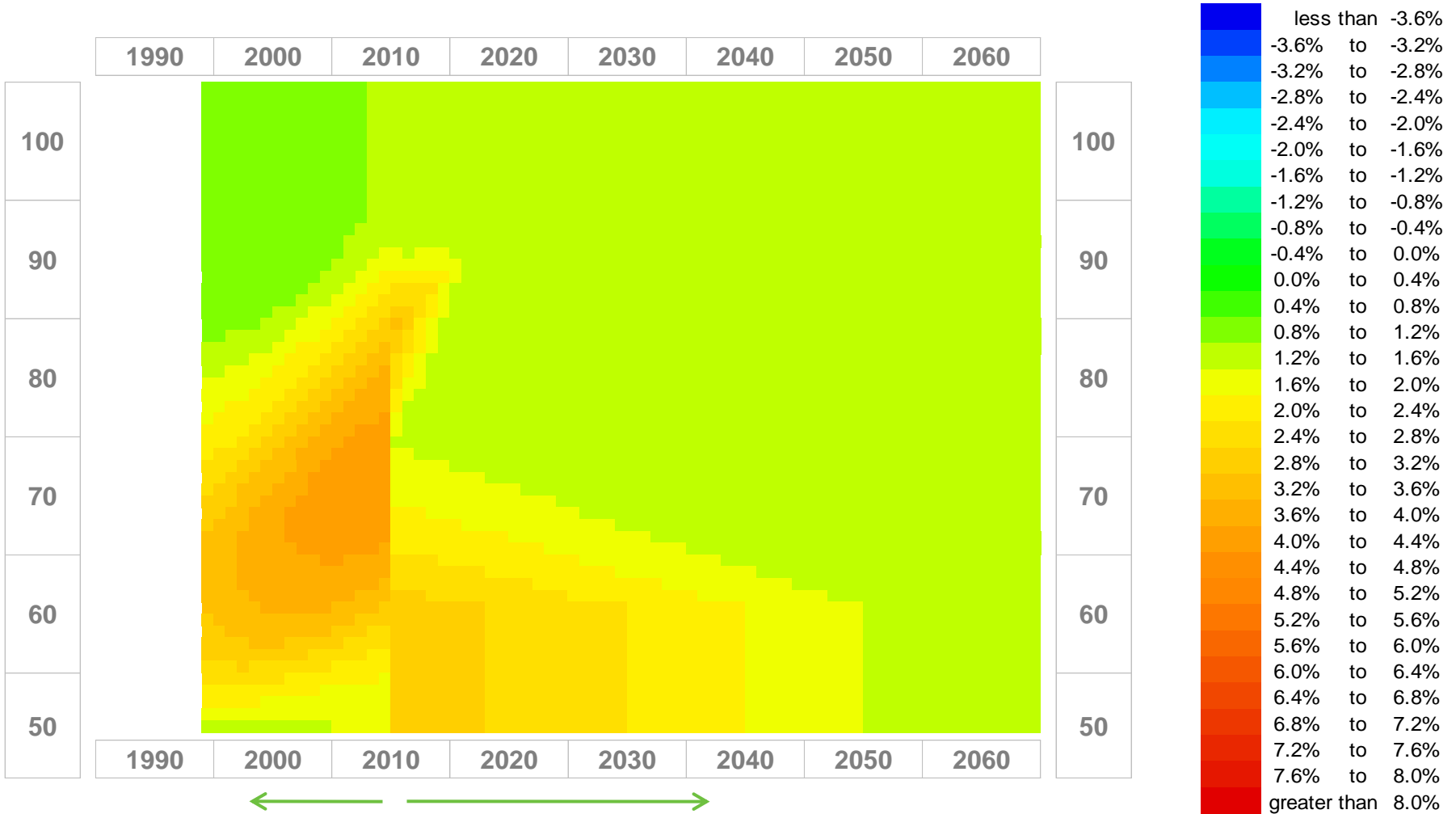
# Variation for individuals - idiosyncratic risk



## Variation in individuals - idiosyncratic risk

- Q4. What proportion of the male pensioner liability relates to those 7.6% with highest life expectancies?
  1. 8%
  2. 13%
  3. 18%
  4. 23%

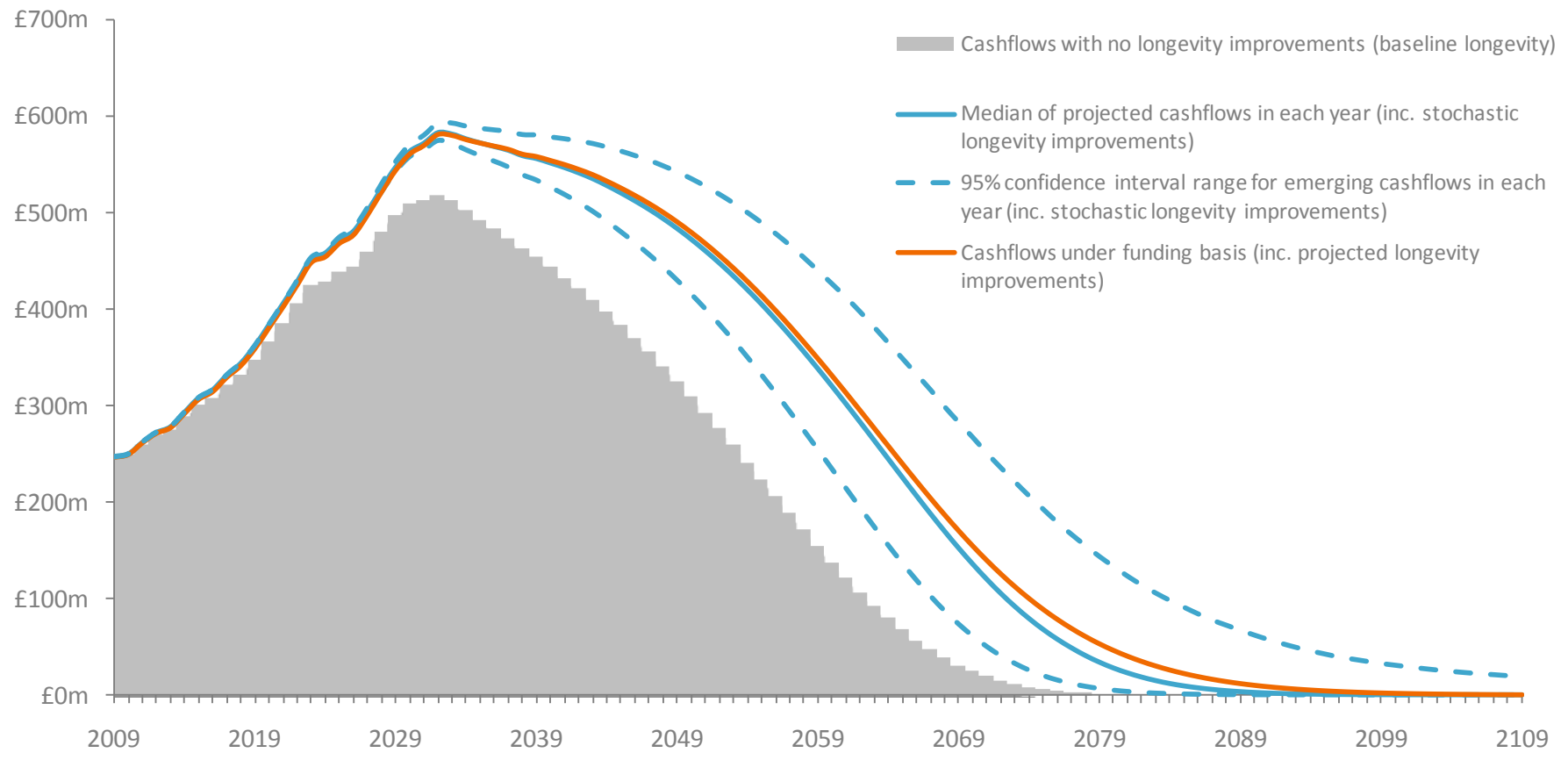
# Future improvements – trend risk



Past Data (Schemes)      Future Projection (Medium cohort with 1.5% min)

# Future improvements – trend risk

### Potential spread of cashflows (all members) owing to longevity trend risk



# How will life expectancies change?

- Much more subjective...
- Do the models help *you*?
- What are the current trends? What are the drivers?
  - Appropriate data? Up to date? Scheme specific risks?
- What are the long term prospects?
  - Medical advances? Lifestyle effects? Long terms trends?
  
- ...so supplement with monitoring

# Strategies to manage risk

**Transfer**

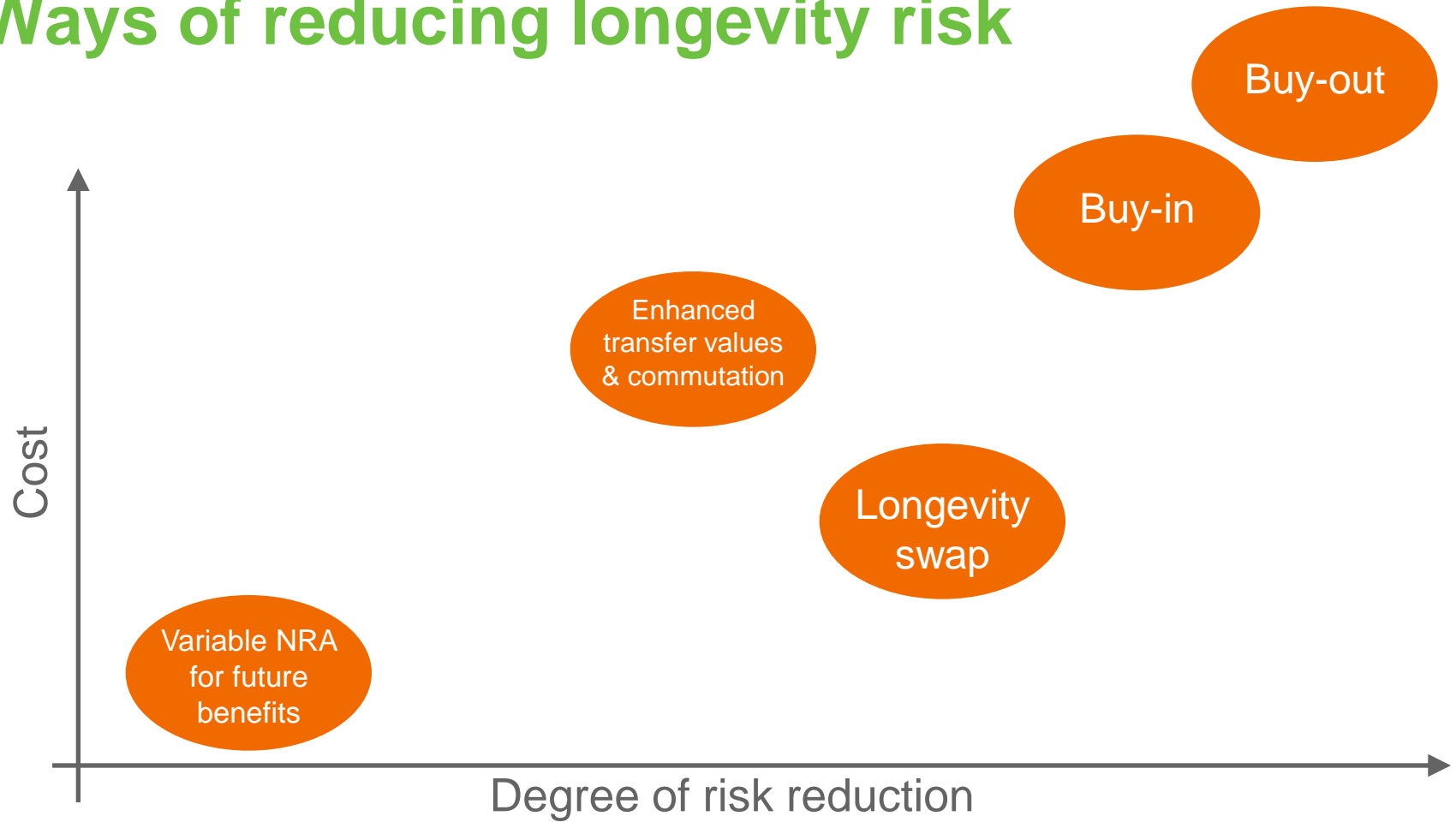
**Avoid**

**Reduce**

**Accept**

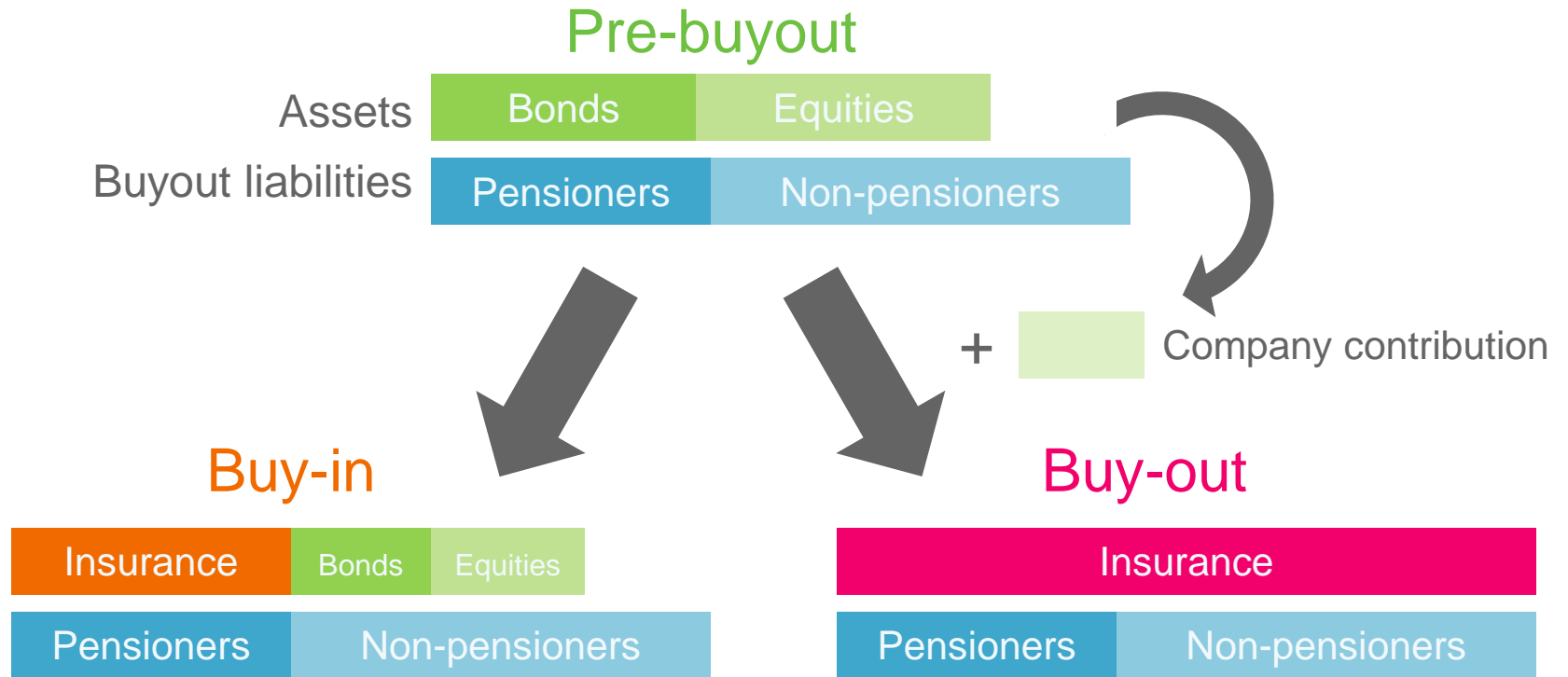


# Ways of reducing longevity risk



	Variable NRA for future benefits	Enhanced transfer values & commutation	Longevity swap	Buy-in	Buy-out
Interest rate risk:	x	x	✓	x	✓
Inflation risk	x	x	✓	x	✓
Longevity risk:	✓	✓	✓	✓	✓

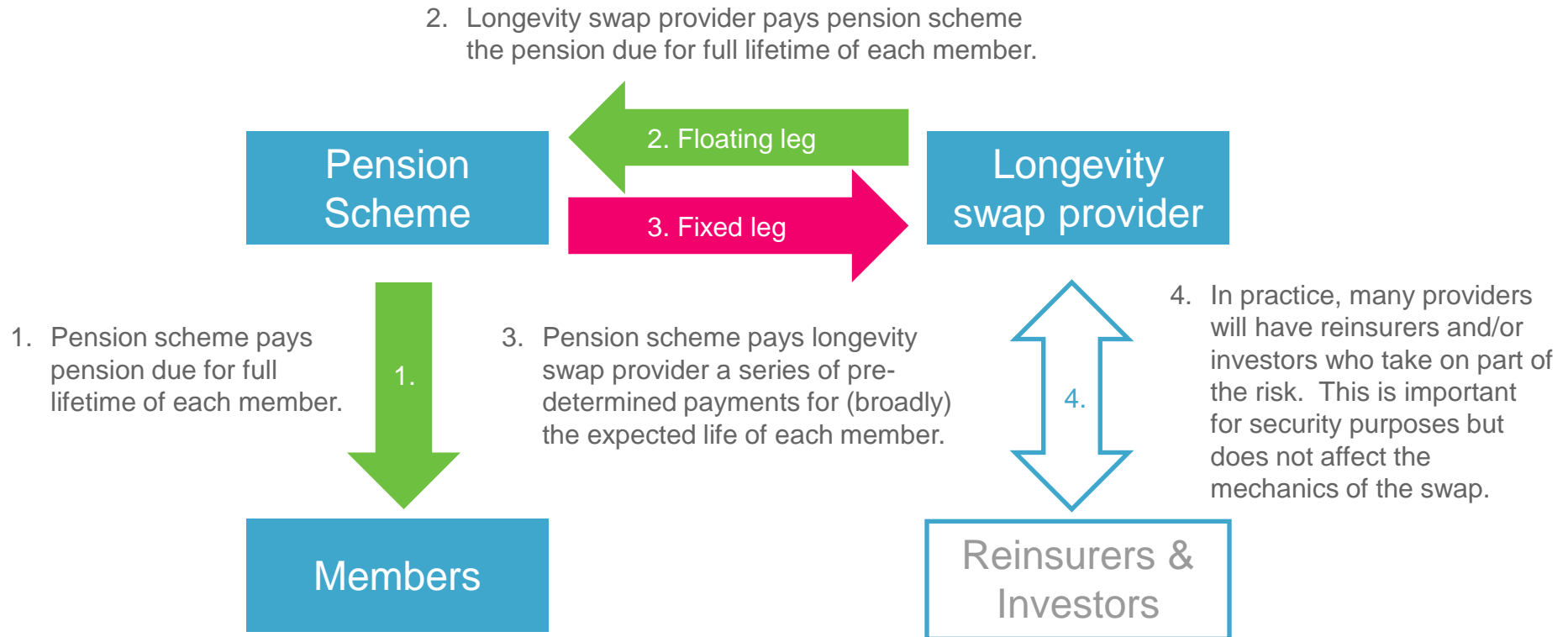
# Buy-in and Buy-out definitions



**Buy-in:** the purchase of an insurance policy (a trustee investment) that exactly matches a sub-section of a continuing scheme's liabilities (often pensioners). Usually forming part of a phased risk reduction strategy.

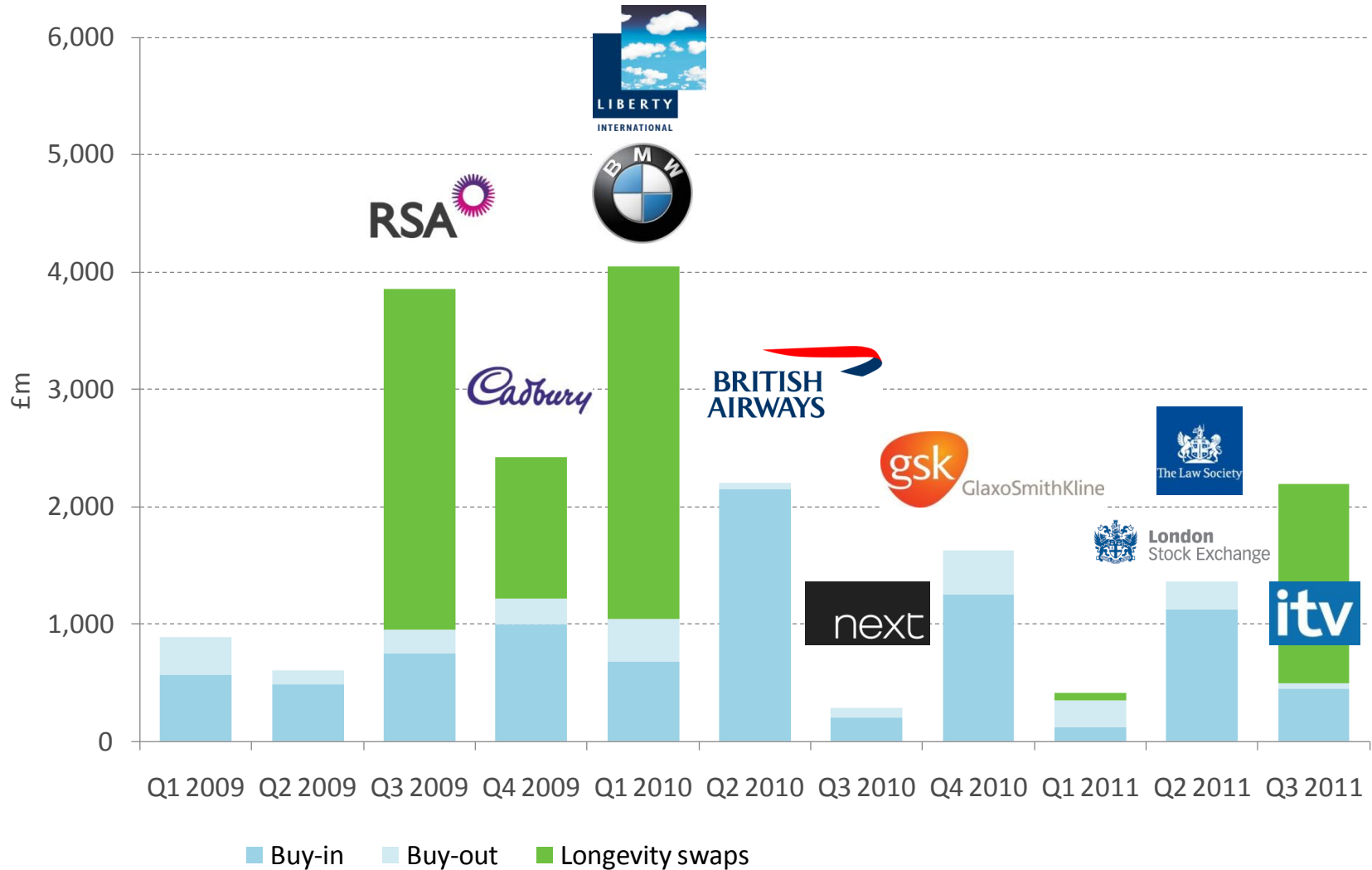
**Buy-out:** The full transfer of a scheme's liabilities to an insurer. Annuity policies are bought in the name of the scheme members. The shell of the remaining scheme is then wound-up.

# How a longevity swap operates



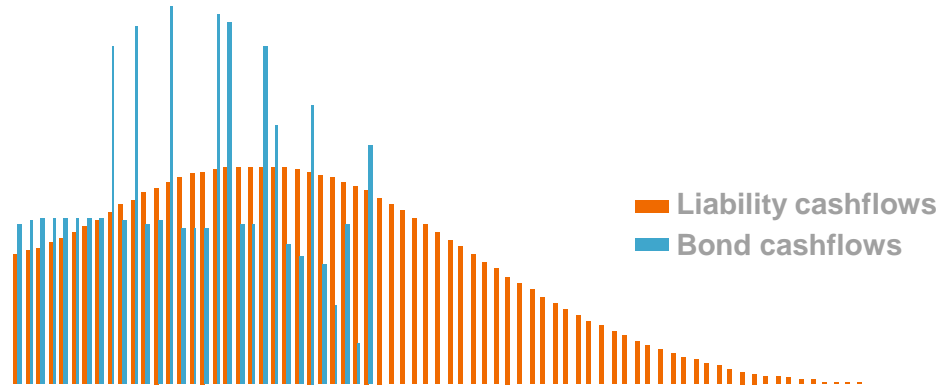
**Net effect of longevity swap**—Pension Scheme pays fixed series of payments, rather than payments that depend on the (uncertain) lifespan of individuals, i.e. they lock into a fixed longevity assumption.

# Trend setters

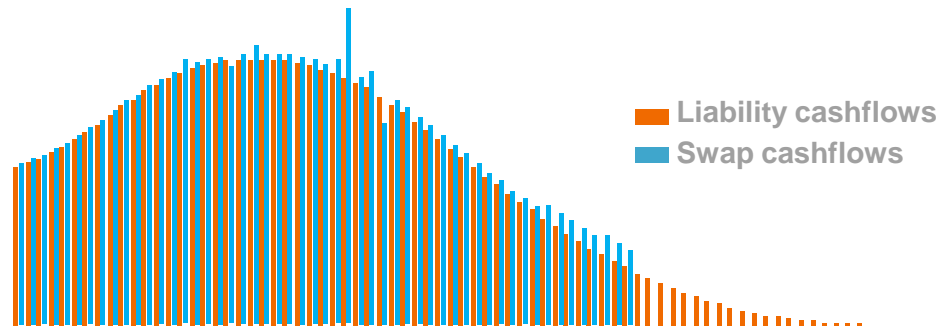


# What's the attraction?

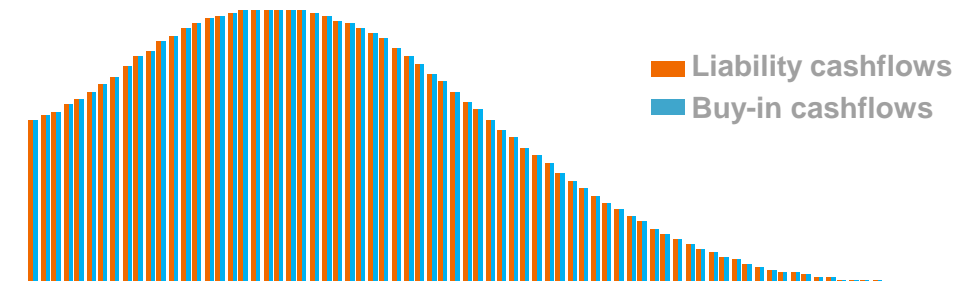
## Bonds



## Liability driven investment (LDI)

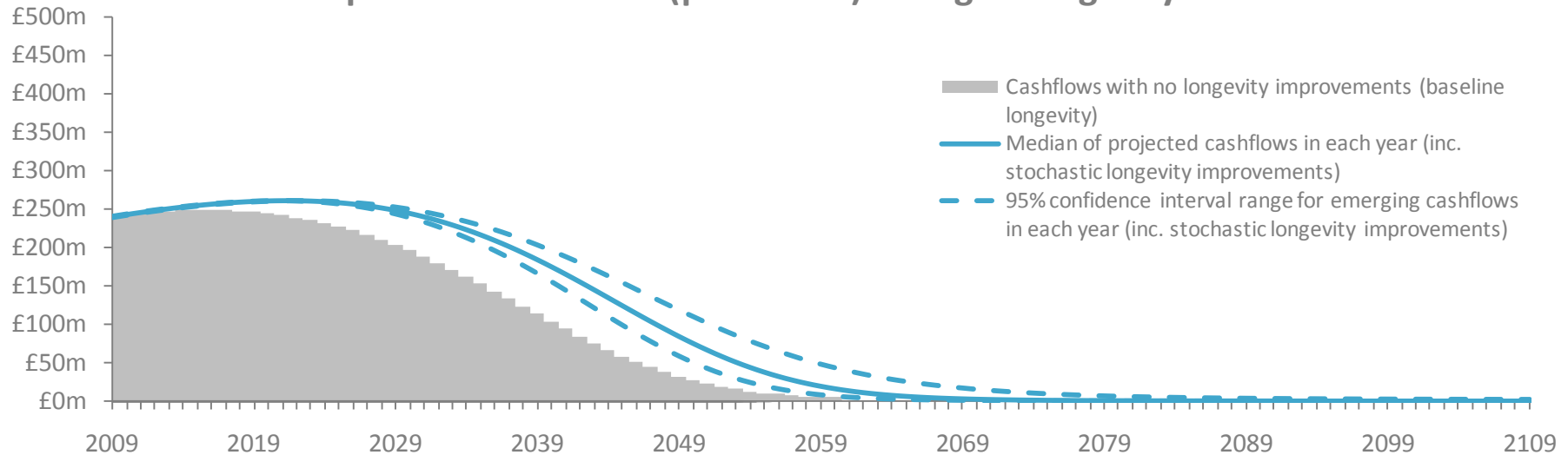


## Buy-in

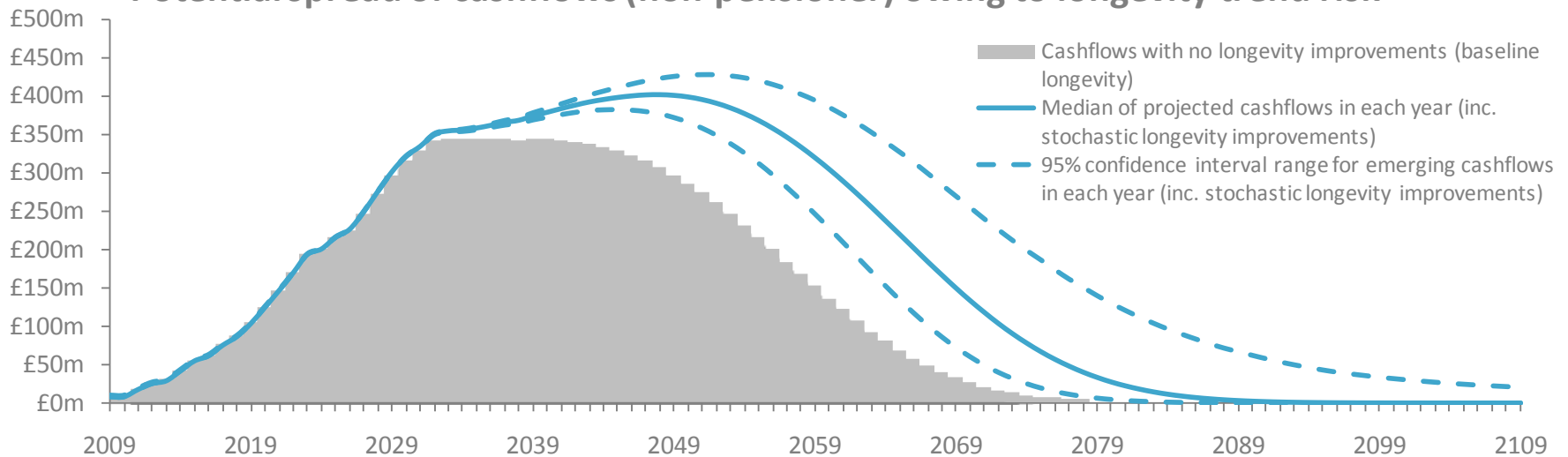


# Pensioner only swap?

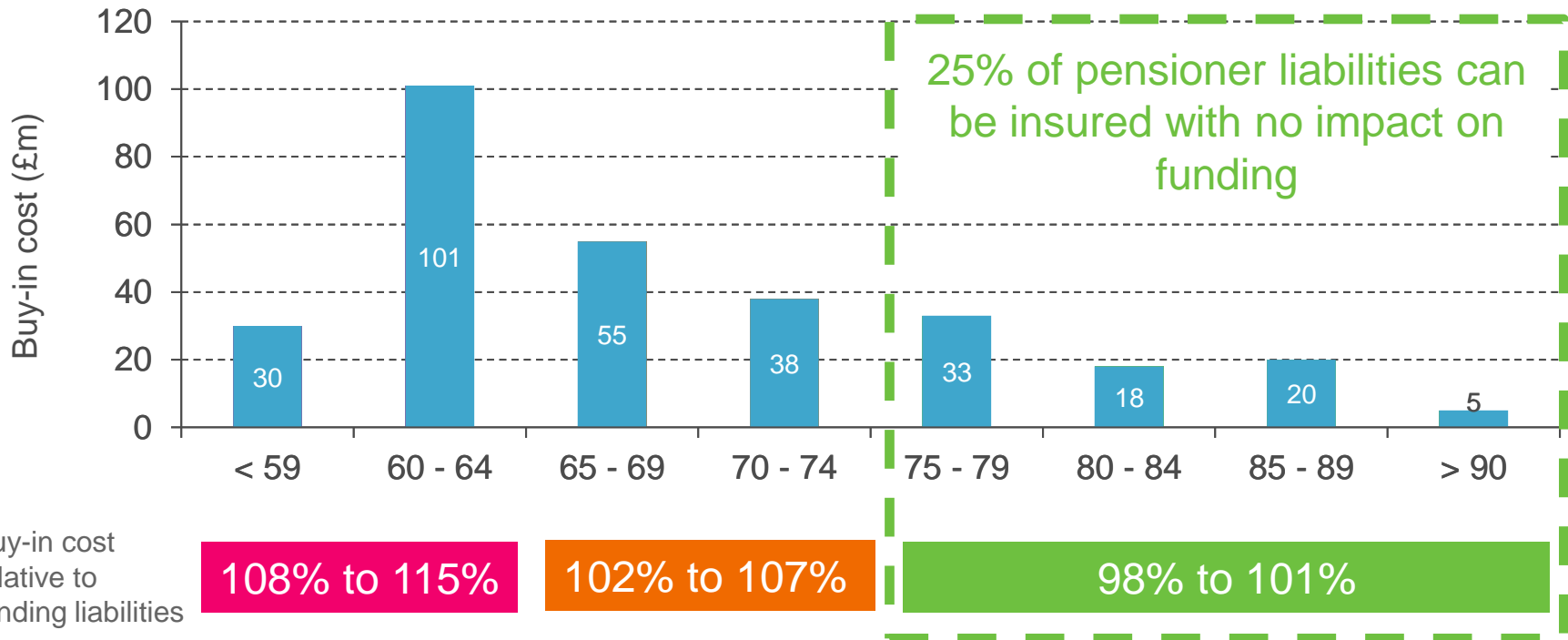
## Potential spread of cashflows (pensioner) owing to longevity trend risk



## Potential spread of cashflows (non-pensioner) owing to longevity trend risk



# Buy-in older pensioners and get longevity protection for free?



# Two's company, 13's a (competitive) crowd?



Most experience of the buyout market (since 1986). Significant market share of buyouts during 2007 and 2008.



The other original insurer in the buyout market (since 1997). However, effectively exited market during 2007.



Sold a modest amount of business during 2007 and 2008 but no published deals in excess of £50m.



Sold a modest amount of business during 2007 and 2008 but no published deals in excess of £20m.



Sold most business of the established insurers who have entered market. Including Friends Provident £350m deal.



Only one published deal to date—£230m ASW Steel Group Pension Fund in June 2006.

Sold by far the most business of the new insurance companies. Significant market share of buyouts during 2007 and 2008.



Set up a subsidiary insurance company called **Rothsay Life**. One published deal to date—£700m Rank Group in Feb 2008.



A subsidiary of the US MetLife bank. First UK buyout deals were completed in March 2008.



Established in 2006 but no published deals so far.



Received FSA approval in November 2007 but already done a £160m pensioner buyout deal with Morgan Crucible.



An insurance company but also invests directly in companies to try to make money from their pension schemes (Telent & Threshers)



No significant published deals so far but a big player in the individual annuity market.

# Tailoring to Caribbean reality?

- Measurement?
  - Better understanding of schemes' longevity risk
- Management?
  - Manage longevity within your risk framework
- Mitigation?
  - What trends will CAA actuaries set?