Longevity as the New Asset Class

Guy Coughlan

September 9, 2011

Agenda

- **Introduction**
- Supply of longevity
- Demand for longevity
- Expanding the asset class

For a new asset class to develop, it must...

- **Be economically significant:** ☑
- **Provide attractive investment exposure** ☑
- **Provide effective hedging** ☑
- **Not be hedgable with existing instruments** ☑
- **Use a standardised and transparent contract** ☑ ?

Trade-off between these

Source: Jan Loeys et. al, (2007)

This new asset class should flourish...

- Size of the potential market
  - ~ $25,000,000,000,000
- Current holders of longevity risk are <u>not</u> the most efficient holders
  - ➔ There is a need to transfer this risk
- Existing capacity is currently insufficient
  - Global insurance and reinsurance markets are too small
  - ➔ Capital markets investors can provide additional capacity

...but only if the capital markets offer a complementary channel for distributing longevity risk

Terminology

Longevity "Hedger"

- An entity that holds longevity risk and wants to get rid of it
- Called a "cedant" in the reinsurance industry

Examples

- A pension plan that is looking to transfer its longevity risk
- An insurer that is looking to reinsure its longevity risk

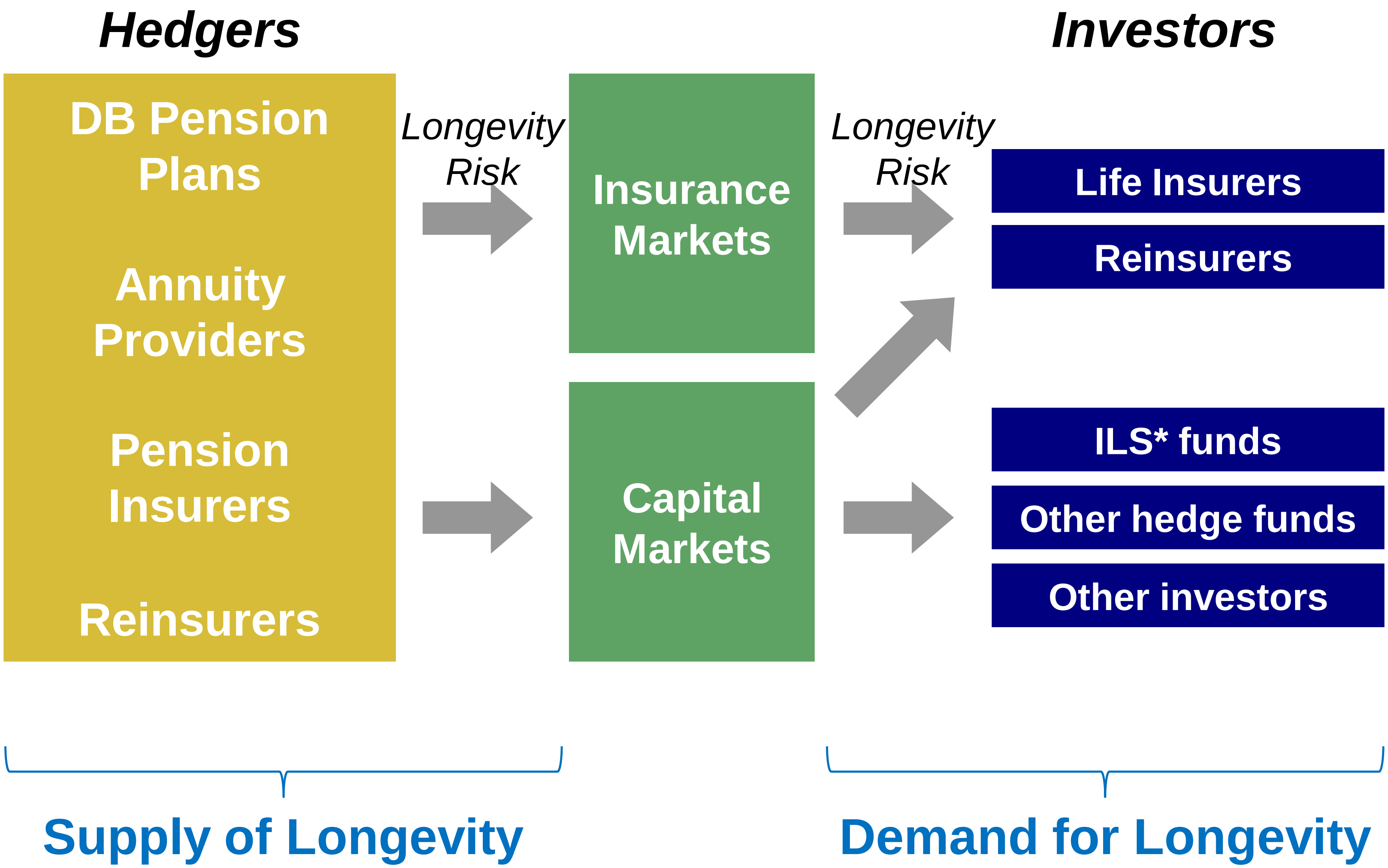
Longevity "Investor"

- An entity that takes longevity risk and receives a risk premium for it
- Provider of longevity hedges

Examples

- A pension plan that hasn't hedged its longevity risk
- An insurer that writes annuities

Supply and demand in the longevity market



*ILS = Insurance-Linked Securities

Agenda

- Introduction
- **Supply of longevity**
- Demand for longevity
- Expanding the asset class

Current institutional investors in longevity

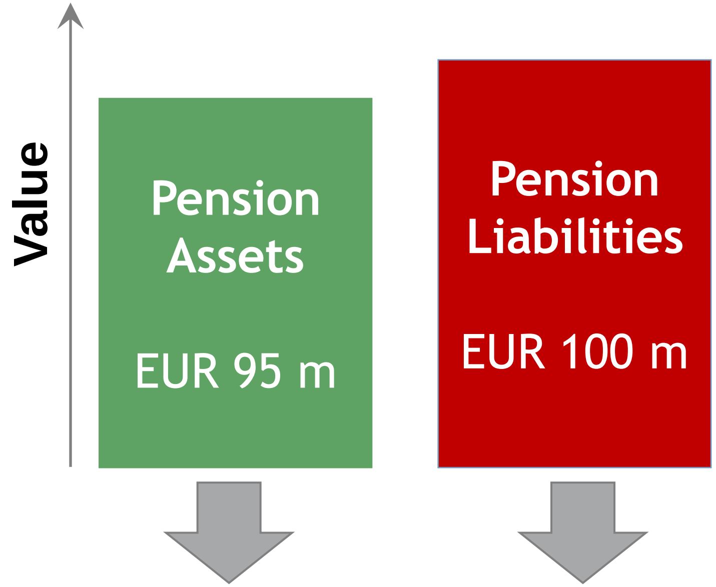
Investor type	Size relative to global holdings
Governments	Huge
DB Pension Plans	Huge
Insurers that write annuities	Small
Reinsurers	Small
Capital markets investors	Tiny

- Most longevity risk resides with institutions ill-equipped to manage it

This needs to rebalanced

Supply-side drivers: DB pension plans

Example: A DB pension plan with 95% funding level



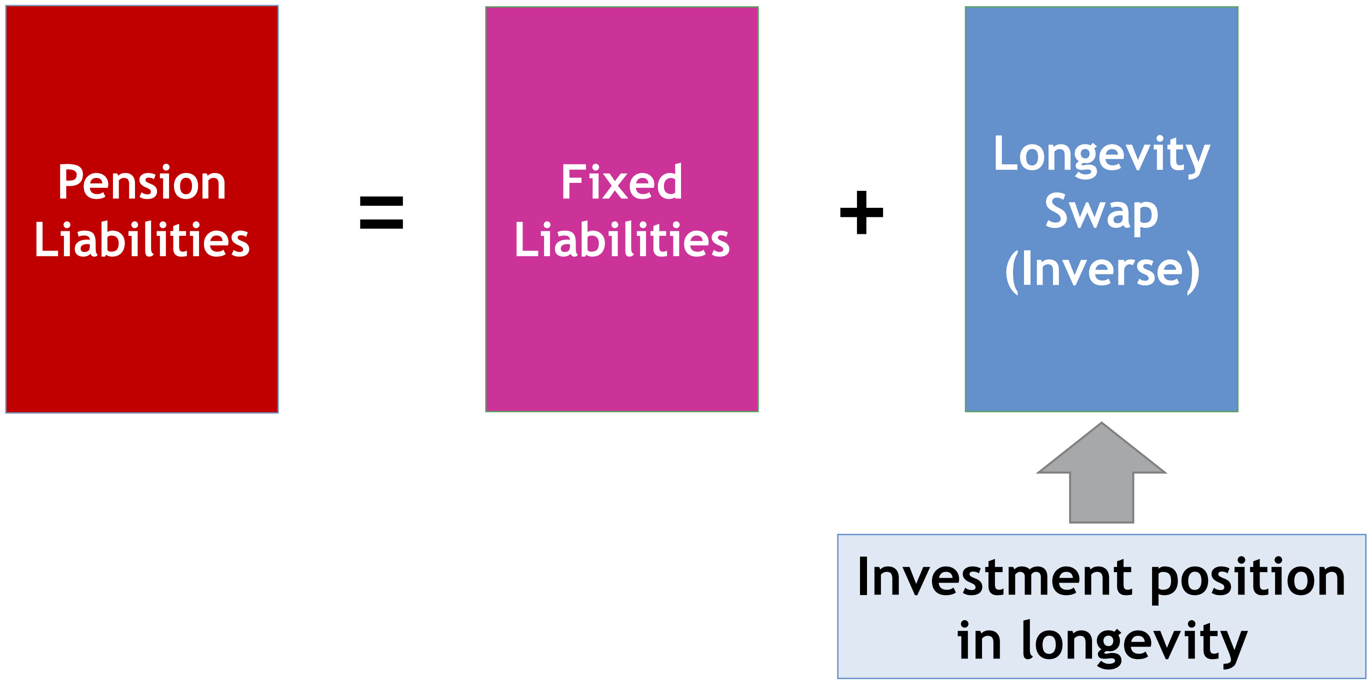
EUR 95 million
Investment risk

EUR 100 million
Interest rate risk — ***Typically Hedged***

EUR 100 million
Inflation risk — ***Typically Hedged***

EUR 100 million
Longevity risk — ***<u>Typically Unhedged</u>***

DB pension plans have an implicit investment in longevity



- Longevity is the biggest investment in the pension plan
- It is a rewarded investment
- It is a buy-and-hold investment
- It is a leveraged investment

Needs to be measured and managed like any other investment

The asset allocation must take account of longevity position

Pension Assets EUR 95 m + **Leveraged Longevity Investment** EUR 100 m = **Total Investment Exposure** EUR 195 m

- The optimal allocation to longevity as an asset class...
  - Will be much smaller than this, but will be non-zero, because
    - Longevity pays a risk premium and offers diversification benefits

It is optimal for pension plans to hedge longevity – but not all of it

Agenda

- Introduction
- Supply of longevity
- **Demand for longevity**
- Expanding the asset class

Demand-side drivers:
Why is there demand from capital markets investors?

- Existing insurance/reinsurance **capacity is small** relative to the potential size of the market
  - ➔ New capital must be attracted to back longevity risk

- Longevity offers an attractive **risk premium**
  - Already exploited by annuity providers and pension insurers

- Longevity offers **diversification** with respect to traditional asset classes
  - Diversification benefits even greater for life insurers

There is a need for capital and the investment is attractive

Demand-side segmentation:
Pure longevity vs. equity in insurers

- What form will the provision of capital take:
  - New insurance capacity?
  - Investors who invest directly in longevity?

Insurance Markets	Capital Markets
↑	↑
Equity investment in Insurer or Reinsurer	Direct investment in Longevity
↑	↑
Multiple risks – financial & operational Leveraged exposure Illiquid if Private Equity	Pure longevity risk

Both forms of capital provision are likely

Direct longevity investments have been placed with capital markets investors

Date	Hedger	Provider	Type	Description
Jan 2008	Lucida	J.P. Morgan	Value hedge	10-year q-Forward (LifeMetrics Index)
July 2008	Canada Life	J.P. Morgan	Cash flow hedge	40-year survivor swap
Feb 2009	Aviva	Royal Bank of Scotland	Cash flow + value hedge	10-year collared survivor swap + final commutation payment
Jan 2011	Pall UK Pension Fund	J.P. Morgan	Value hedge	10-year q-Forward (LifeMetrics Index)

- Investors have invested in swap format to maximize returns
- Specialised investor group – ILS funds

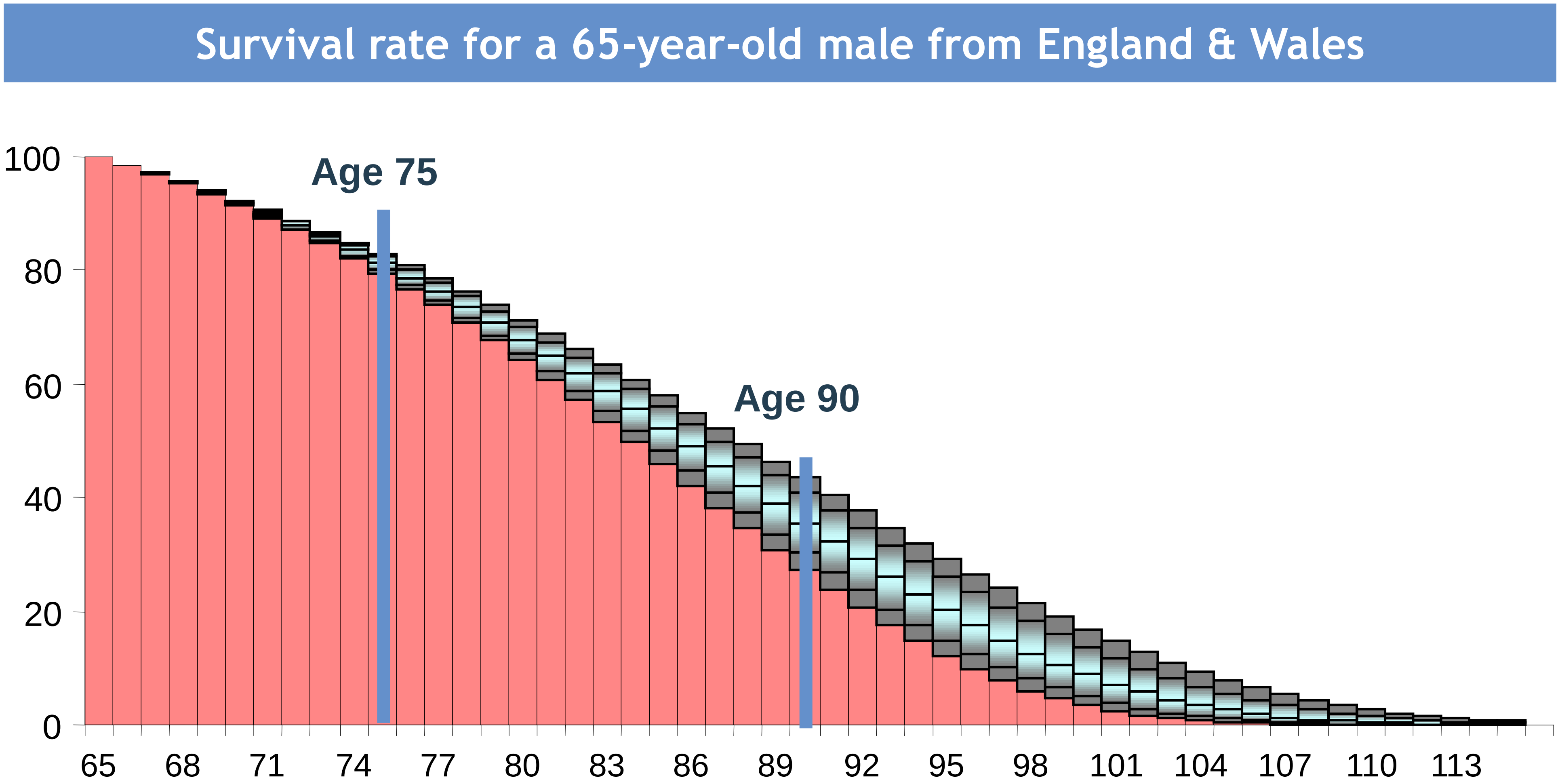
A key element of demand segmentation is the what is being hedged: Cash flow or Value

- **Cash flow hedge**
  - Hedging the individual cash flows in a pension liability in each period
  - This is the insurance *indemnity paradigm*

- **Value hedge**
  - Hedges the value of the liability at a future time horizon
  - Takes account of all cash flows beyond the horizon
  - This is the *risk management paradigm*

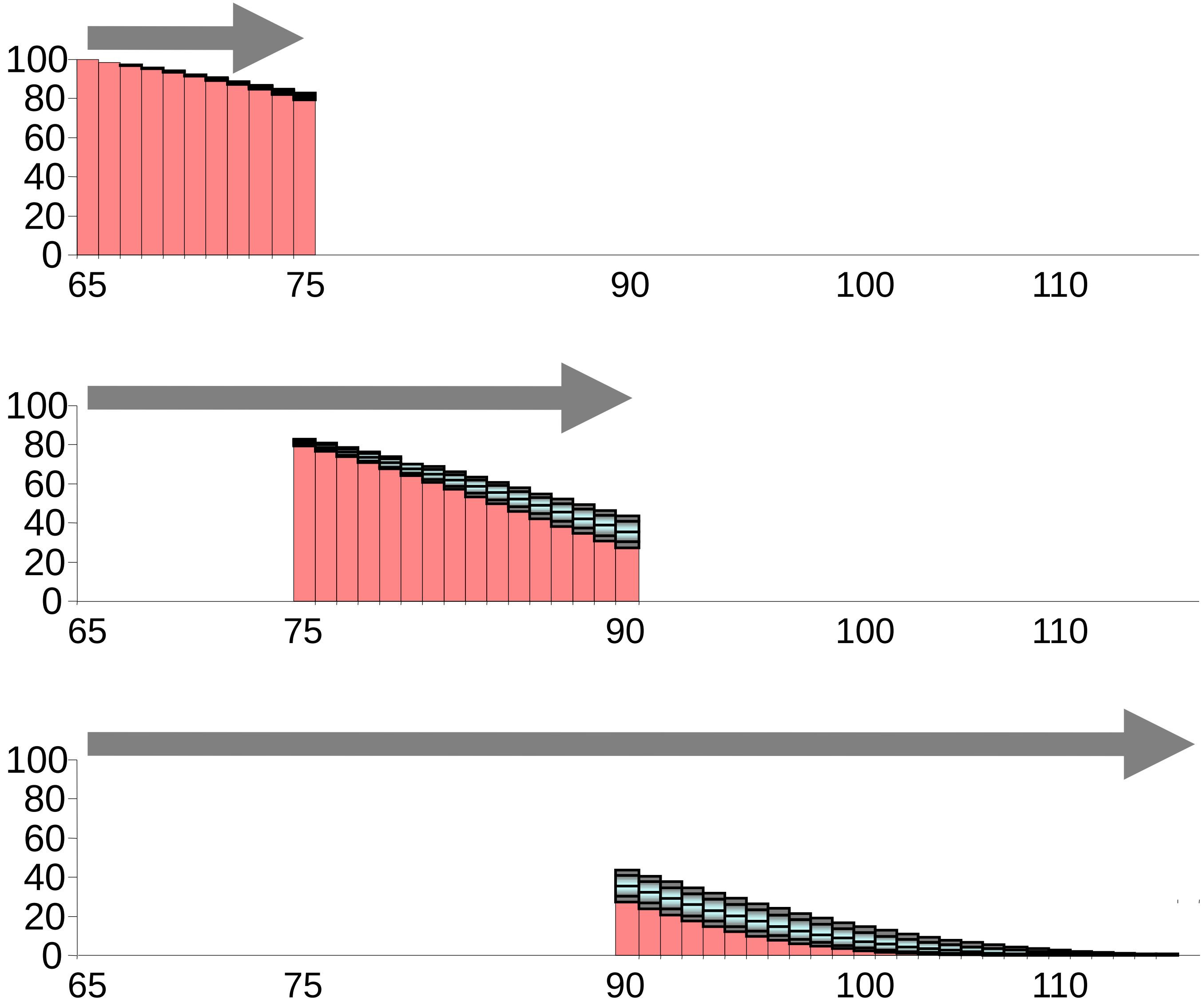
Each has a different "natural" investor base

Hedging annuities at a fixed age: Time Segmentation of demand



Time segmentation of investors:
Provision of *cash flow* hedges for age 65

Natural holders of cash flow longevity risks for 65-year-old males



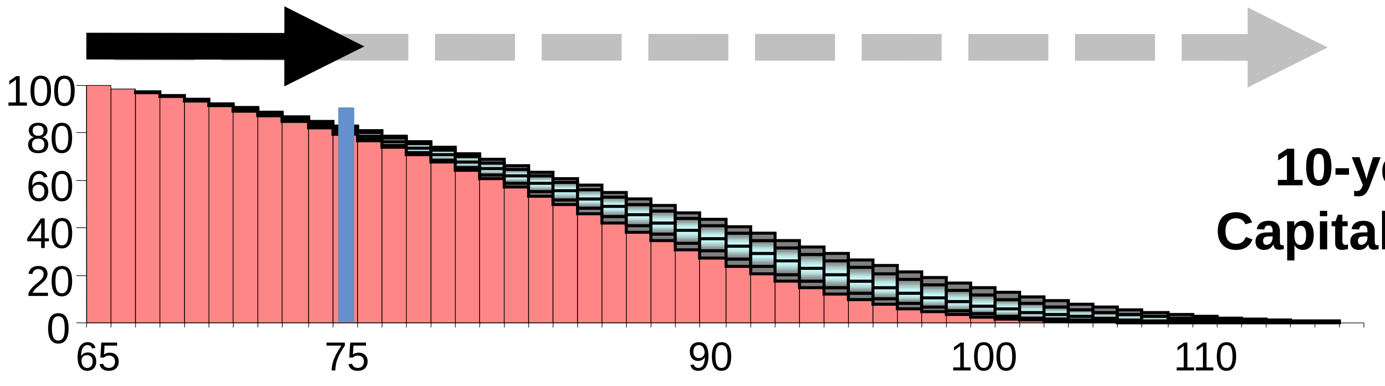
Age 65-75:
Insurers

Age 75-90:
Insurers
Governments(?)

Age 90+:
Governments

Segmentation of investors:
Provision of *value* hedges for age 65

Natural holders of value longevity risks for 65-year-old males



Age 65+
10-year value hedge:
Capital Markets Investors

Final remarks on demand segmentation

- For younger pre-retirement members value hedges are probably the only practical near-term solution
  - Long duration longevity risk
  - Insurers and reinsurers are reluctant to take this risk on its own
  - A value hedge is natural because there is no cash flow risk until retirement
  - Example: Pall UK Pension Fund hedge

- Natural individual holders of higher age longevity risk are very young workers
  - Their own longevity risk won’t manifest itself many for decades
  - Intergenerational longevity risk sharing

Agenda

- Introduction
- Supply of longevity
- Demand for longevity
- **Expanding the asset class**

Supply and demand mismatch (capital markets investors)

Supply-side requirements

- Customised hedges
- Long duration
- Collateral

Demand-side requirements

- Standardised investments
- Short duration
- Liquidity

- **Standardisation addressed by**
  - Industry initiatives: e.g., LLMA and LifeMetrics
  - Index-based hedges for pre-retirement pension members
- **Long duration addressed by**
  - Provision of liquidity by an intermediary – investor compromises
  - Hedge value not cash flow – hedger compromises

Challenges for the supply-side

- **Recognise the extent of their implicit longevity investment**
  - It is the biggest investment position of any asset class
- **Evaluate the liability on a basis as close as possible to the true economics**
  - E.g., discounting based on swaps with realistic longevity assumptions
- **Change mindset about longevity hedging**
  - Move perspective from *“indemnification”* to *“risk management”*
    - Understand basis risk
  - Consider alternative hedging approaches:
    - Index-based hedges, or
    - Shorter maturity hedges of liability value

Challenges for the demand-side

- **Education**
  - Development of longevity expertise
  - Development of longevity investment capabilities

- **Structuring portfolios** to cope with longevity positions with longer maturity and lower liquidity than other investments

- **Develop capabilities to invest in derivative format**
  - Swaps as well as bonds

- **Working with hedgers and intermediaries** to develop new investment structures to address liquidity and maturity challenges

Challenges for intermediaries

- **Provide liquidity to investors**
  - Now more difficult for banks
  - Opportunity for insurers/reinsurers?

- **Provide credit intermediation**
  - Remains a core competence of banks

- **Develop attractive bond-like products**
  - Essential to open up a larger universe of fixed-income investors