



# **Standardising the Longevity Market – Have we arrived yet? An update on the work of the LLMA**

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## Agenda

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- Introduction
- Longevity – What's at stake?
- The Longevity Market So Far
- The role of the LLMA
- Challenges to a liquid longevity market



## 1. Introduction



# Objective and scope of the LLMA's activities

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## Objective

*The objective of the Association is to provide a forum for market participants to collaborate with a view to articulating criteria for, and assisting in the establishment of, suitable and consistent standards, conventions and best practices to promote liquidity in the trading of financial instruments that reference longevity and mortality related risks as well as consistency of relevant demographic data*

## Scope

The primary focus of the LLMA is pension-related longevity and mortality, rather than life settlements. In the short term the LLMA will be primarily focused on the UK market for longevity and mortality, but may later expand its horizons to other countries.

## Members

Current members are (in alphabetical order):

AVIVA, AXA, Deutsche Bank, J.P. Morgan, Legal & General, Morgan Stanley, Munich Re, Pension Corporation, Prudential and Swiss Re



## **2. Longevity – what's at stake?**



## Setting the Scene

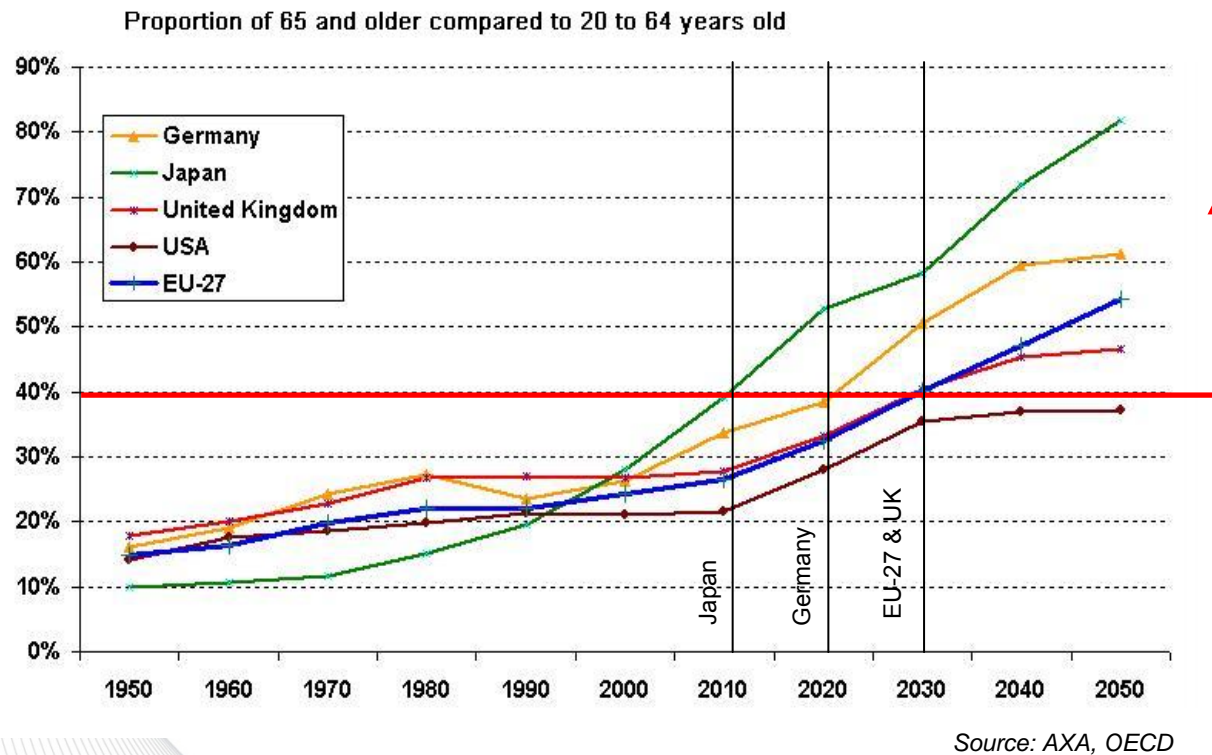
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- Insurance companies & pension funds provide annuities to individuals (or groups)
  - **Life annuity guarantee** *de facto* transfers **longevity risk** from policyholder/pensioners to the professional underwriters, who (hopefully) knowingly take on risks they want/know how to price
  - OECD estimates: **US\$20 trillion in longevity exposure** worldwide, **90% from pension funds & 10% from insurers**
  - Many pension schemes already running on a **deficit** in part due to the **under-reserving of the fund, poor asset-liability management** and obviously the recent market turmoil / **lower yields**
    - public sector: £1.3trn in the UK in 2011 (*source: Pension Protection Fund*); US\$2trn – US\$3trn in the US in 2009 (*source: Congressional Budget Office*)
    - private sector: £295bn in the UK in 2011 (*source: KPMG*); US\$450bn in 2011 for S&P500 companies (*source: Credit Suisse*)

# An ageing phenomenon having a strong impact on pension schemes



- **Pay-as-you-go systems clearly not sustainable**

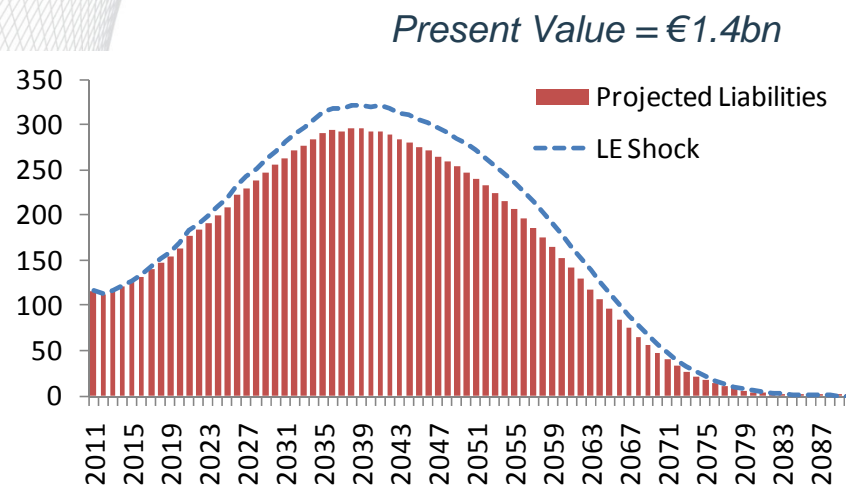


- **Populations / political decision makers need to be aware of the risks and bear the economic & social consequences of these imbalances, which also reflect public choices (labor market rules, immigration)**

## Nature of the risk

- Longevity is a risk arising from **long dated liabilities from pension funds and insurance annuity books**
- Liability duration varies depending on type of business (deferred or in-payment) or combination and tends to vary between 10 – 30 years

### Projected Liability Cashflows (€m)



*One year extension in LE  
~ 3 – 5% increase in liabilities PV  
(in this case liabilities would increase by  
€40m – €70m....) at age 65*



# Managing Longevity Risk

- Hedging longevity risk is now an important element of risk management for many organizations
- It is expected by the market that momentum will now continue to grow significantly, constrained only by capacity
- To date almost all the longevity capacity has been provided by the (re)insurance markets



## Routes to risk management must expand

- There is insufficient capacity in the (re)insurance markets to absorb a large proportion of this risk.
- The capital markets are developing as an alternative channel for longevity hedging
  - The capital markets are complementary to the insurance markets
  - The capital markets bring additional risk bearing capacity and potential for greater liquidity





### **3. The Longevity Market So Far**



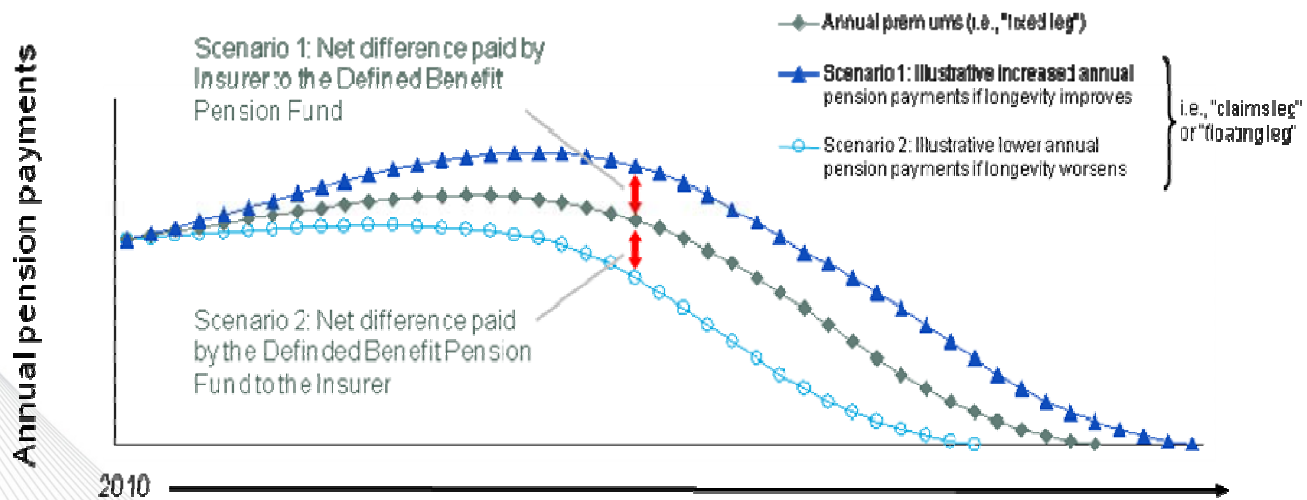
## Common options for managing longevity risk

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Strategy	Description
<b>Longevity Swap / Reinsurance</b>	<ul style="list-style-type: none"><li>■ Scheme/Annuitant specific transfer of longevity risk through an insurance contract or derivative contract</li></ul>
<b>Buyout or buy-in</b>	<ul style="list-style-type: none"><li>■ Full asset and liability transfer to a third party insurer (buyout)</li><li>■ Purchase of a bulk annuity policy within the pension scheme (buy-in) or by the insurance company</li></ul>
<b>Synthetic Buy-In</b>	<ul style="list-style-type: none"><li>■ Longevity Swap combined with asset solution to part or fully fund longevity swap cost</li></ul>
<b>Index Based Hedge</b>	<ul style="list-style-type: none"><li>■ Scheme specific base table (determined by scheme or via post code analysis)</li><li>■ Scheme specific benefit modelling</li><li>■ Population based mortality improvements</li></ul>

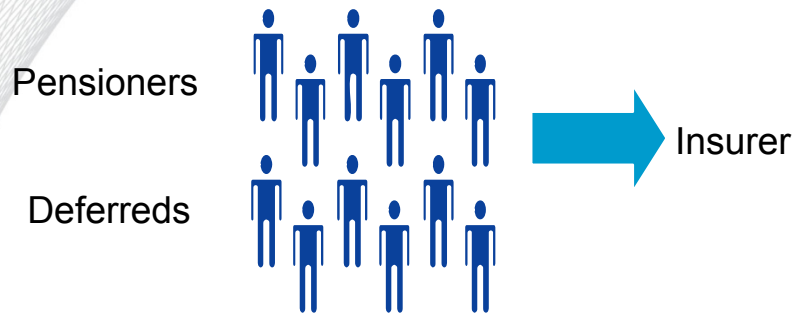
# Longevity Swaps

- Transfer of the risk from a pension fund to an insurer/bank, or from an insurer to a reinsurer
- Payment by annual premiums, corresponding to the net position (like a swap)
- Only transfer of the longevity risk: the assets remain with the seller
- Increasingly being used by pension funds in the UK



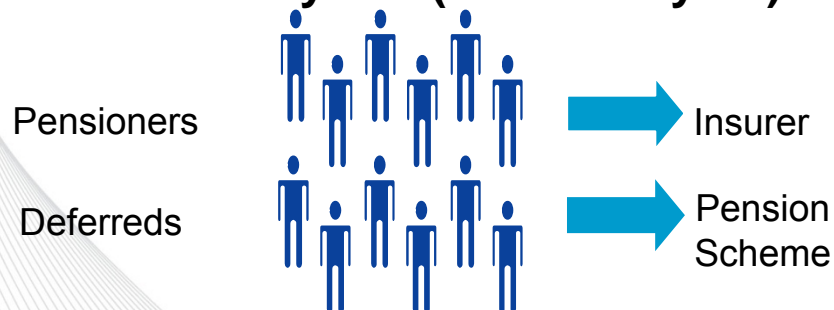
# Buyout / Buyin

## Full Buy-out



- Full transfer of a scheme's liabilities to an insurer
- Usual followed by wind up
- Ensures full risk transfer
- Single premium payment

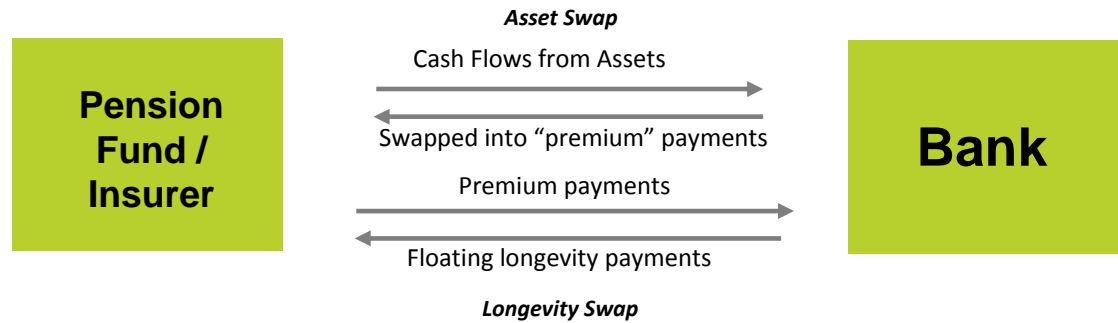
## Partial Buy-out (or the 'Buy in')



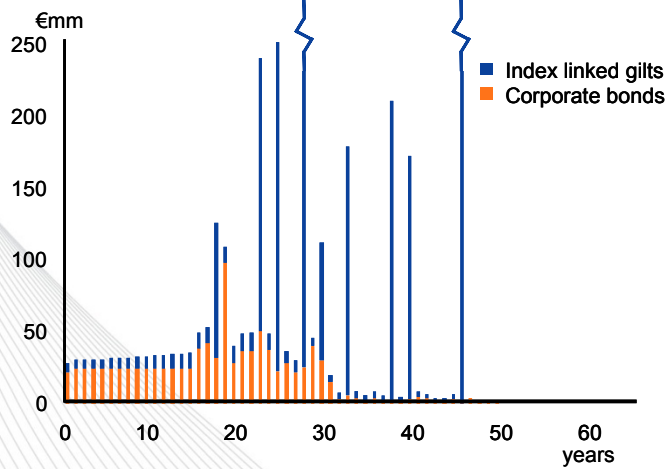
- Bulk annuity is purchased to transfer risk in pensioners only
- Large risk transfer, esp. for mature schemes
- Lower cost than full buyout
- Scheme retains deferreds risk



# Synthetic Buy In

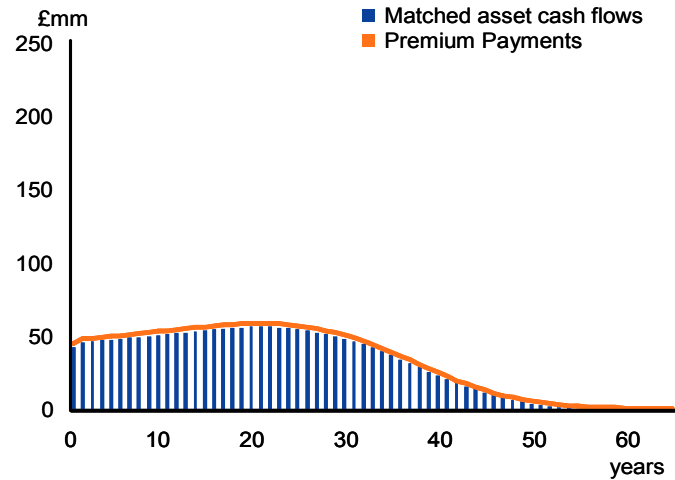


Cash Flows from Optimised Index Linked Gilt Portfolio Plus Existing Corporate Bond



Source: Deutsche Bank

Longevity Hedge Premium Payments and Matched Asset Cash Flows



Source: Deutsche Bank



# Major Transactions

## Bulk Annuity / Buy-In

- Pension buy-in and buy-out deals exceeded **€4.6bn in 2011**
- 2012 was a bumper year, with Prudential US completing the largest buyout transaction ever done for \$26bn of pension liability, as well as £5bn by June 2012

## Synthetic Annuity

- Synthetic buy-in's tend to be more dependent on asset markets and respective opportunities



*£1.3bn  
Dec 2011*

## Longevity swaps

- Deals totaling **£7bn in 2011** for pension schemes of blue chip companies



*£2.8bn  
Nov 2011*

*£1.1bn  
Jan 2012*



*£1.7bn  
Aug 2011*

- Longevity swaps **over the last 5 years** had covered **~ £16bn** of liabilities
- Vast majority have been bespoke transactions (indemnity-based deals)





## Indemnity vs index based risk covers

### What they are...

- Indemnity risk covers
  - Full cover of longevity risk in portfolio
  - Locked-in solution for extended time period
  - Appealing to reinsurers
- Index-based swaps: a solution to the limited capacity of the reinsurance market
  - Lower price than indemnity transactions
  - Save time
  - A diversifying asset to investors

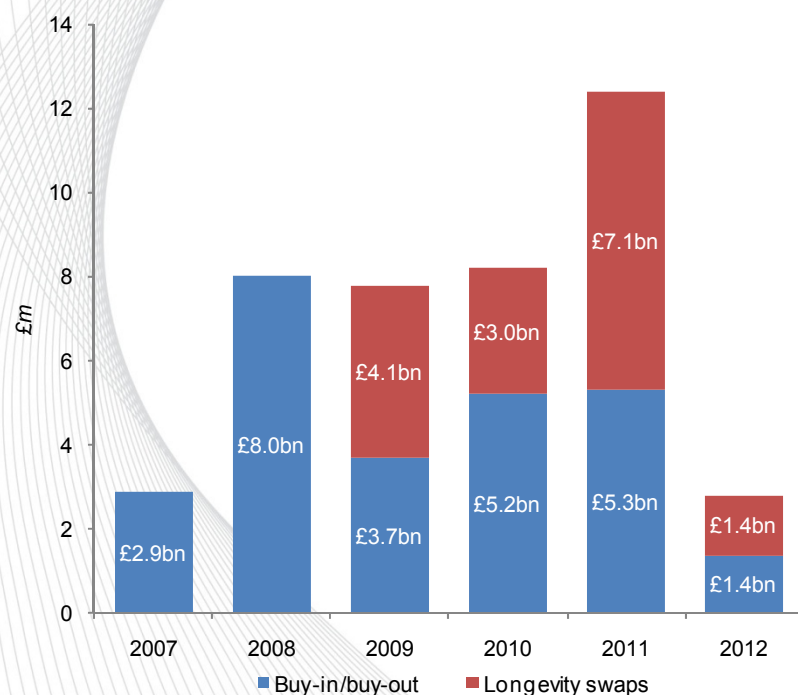
### What they are not

- A perfect solution
  - Indemnity deals can be expensive
  - Index-based swaps entail basis risk
- A cover-up for inadequate provisions
  - Covers compensate for deviations in future mortality trends, not shortfalls stemming from past misestimating (changes in best-estimate)
- An easy way out
  - Thorough cost/benefit analysis required

Both covers are effective risk management tools in a Solvency II world  
Structure of the risk cover must be aligned with company's internal measure of longevity exposure

## Indemnity vs index based

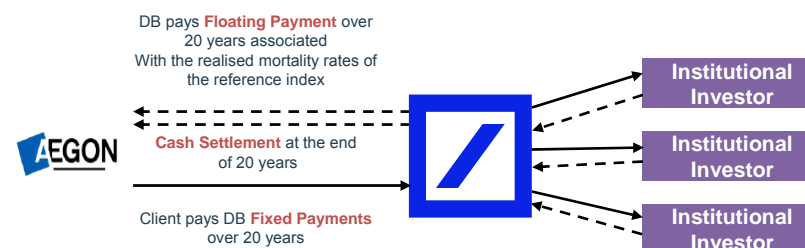
- Proportion of buy outs/ buy ins/ indemnity swaps show that popularity of swaps is growing but index based hedging remains limited
- Swiss Re/ Akzo Nobel Longevity Swap for £1.4bn followed in Sep.2012
- 2012 buyouts – off the scale.....



Source: Hymans Robertson covers transactions up to end Q1 2012

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- Of deal flow shown, only £70m notional in 2011 was index-linked (Pall Pension deal – E&W Population linked)
- AEGON transaction in March 2012 on €12bn (out of €30bn) was also index-linked (Dutch Population Mortality)
- Index-based, out of the money with a cap and a floor, and for 20 years only
- Designed to free up capital for the insurer and to be attractive for investors





## 4. The Role of the LLMA



## The need for an Association

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The **Life and Longevity Markets Association** ('LLMA') is a non-profit organisation funded by current members

Its aim is to allow the capital markets to invest with confidence in this new asset class, which will bring knock-on benefits of increased stability and certainty to the pension funds and insurance companies.

The Association aims to support the creation of a liquid market in Longevity Risk.



## What does the LLMA do?

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**The LLMA has been formed to promote the development of a liquid traded market in longevity and mortality-related risk, of the type that exists for Insurance Linked Securities (ILS), and other large trend risks like interest rates and inflation**

**Output from the Association includes:**

- **Standardised glossary of terms**
- **Standardised longevity product definitions**
- **Standardised documentation**
- **Longevity indices and index methodologies**
- **Standardised valuation/pricing model for longevity**



# Longevity Indices Being Published

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The LLMA publishes population mortality indices for England and Wales, Holland, Germany and the US

## Data

- Exposure (e.g. number of lives at an indicated time)
- Death (e.g. number of deaths over a defined period)
- Annual frequency

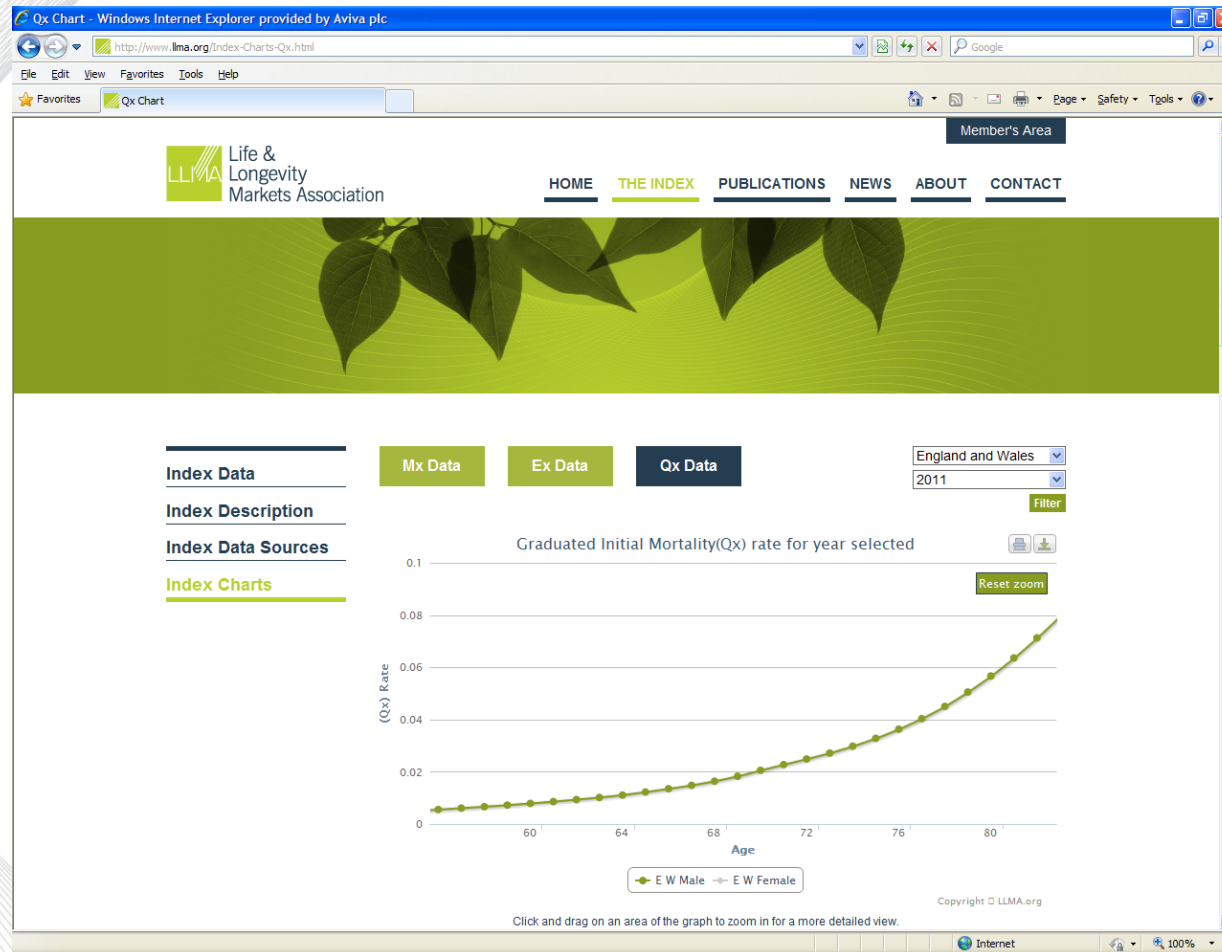
## Metrics

- Crude mortality rates
- Graduated mortality rates
- Period life expectancies

## Breakdown

- Age
- Gender
- Country

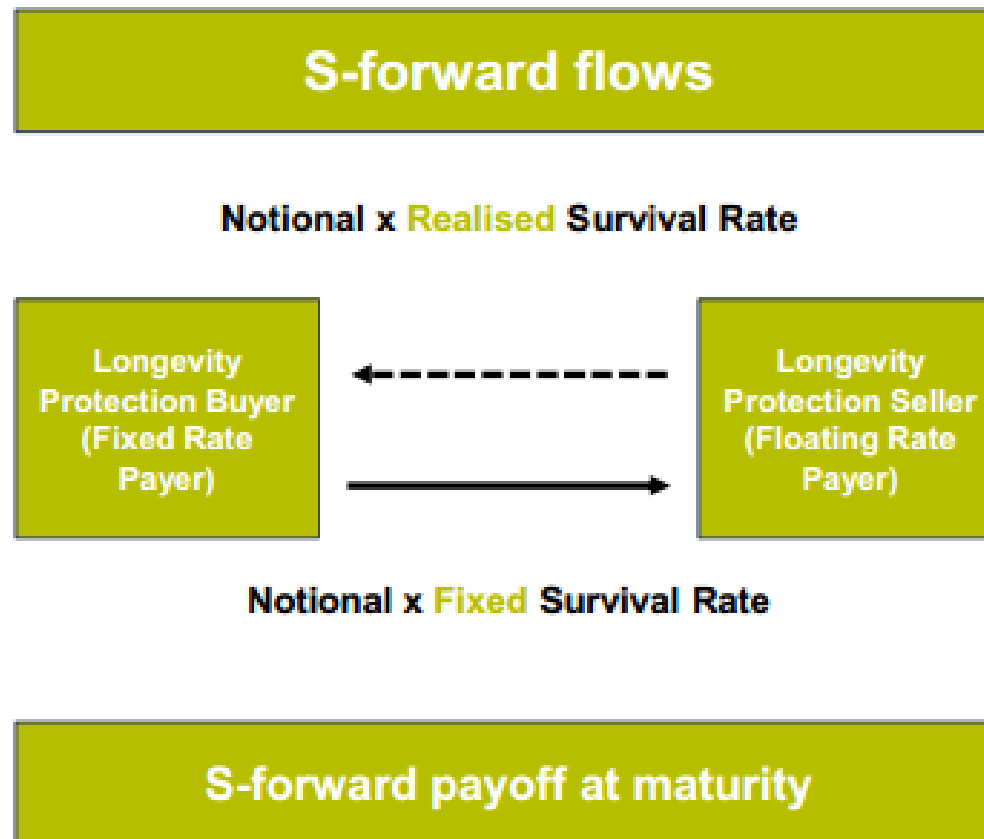
# Index example England & Wales 2011



## Examples of output so far....

- Technical Documents
- Term Sheets
- Pricing Document
- ...and more

See: [www.llma.org](http://www.llma.org)







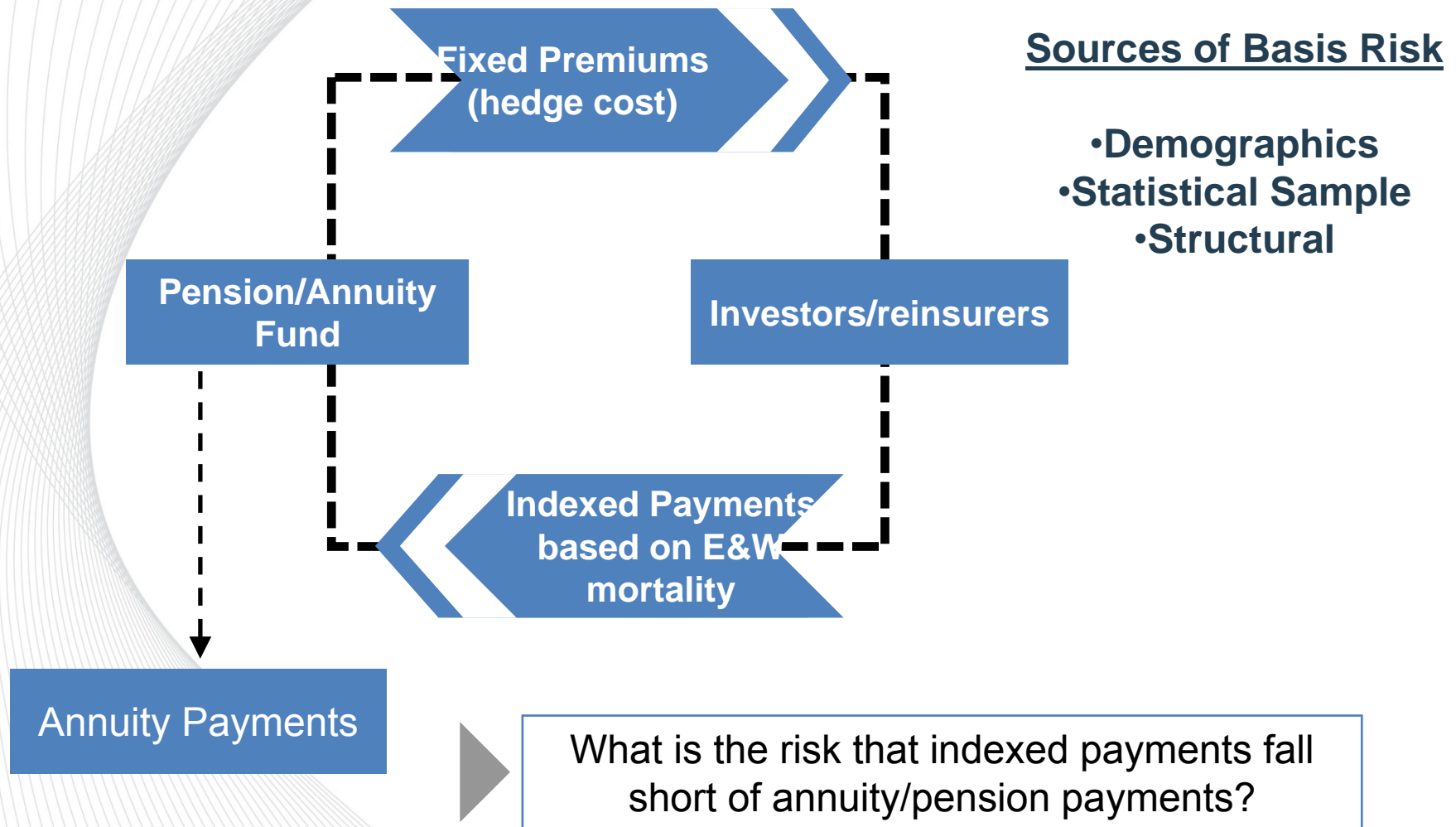
## LLMA – The Future

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- **Support – technically and financially – the joint initiative with the Institute and Faculty of Actuaries in the UK on Longevity Basis Risk**
- **Continue to maintain and administer existing indices**
- **Work with participants on initiatives to improve market liquidity**



# The Basis Risk Question for indexed based transactions



## Or in other words...

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**Boxster**  
Inner Fire.



# The Longevity Basis Risk Working Group: The LLMA and the Institute and Faculty of Actuaries

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## Objective

- Define a practical methodology to assess basis risks for longevity transactions which is easily accessible to market practitioners

## Work Performed

- Review of existing literature
- Identification of available inputs and desired outputs
- Simplified spreadsheet analysis

## Initial Conclusions

- Significant amount of research required
- Necessary to involve a consultancy or academic institute
- Produce a tender document to distribute to respondents and start formal research



## 5. Challenges

# Challenges to create an active market for longevity risk transfer



## Insurers & Pension funds

- **Solvency II** in Europe may encourage offloading longevity risk for insurers/reinsurers having an unbalanced risk profile
- Existing issues:
  - **Bespoke** vs **index-based** transactions -> limited attractiveness vs **basis risk**
  - **Affordable** price
  - **Regulatory recognition** of the transaction benefits

## Banks

- Investor education in progress – more needed
- Robust framework and systems for managing and syndicating risk
- Market making

## Capital Markets investors

- Potential **diversification** of portfolios with an uncorrelated risk
- Existing challenges to increasing investor appetite
  - Lack of **standardization** and transparency
  - Poor **knowledge** of longevity risk and lack of consensus on future trends
  - **Long-term** risk
  - Lack of **liquidity**

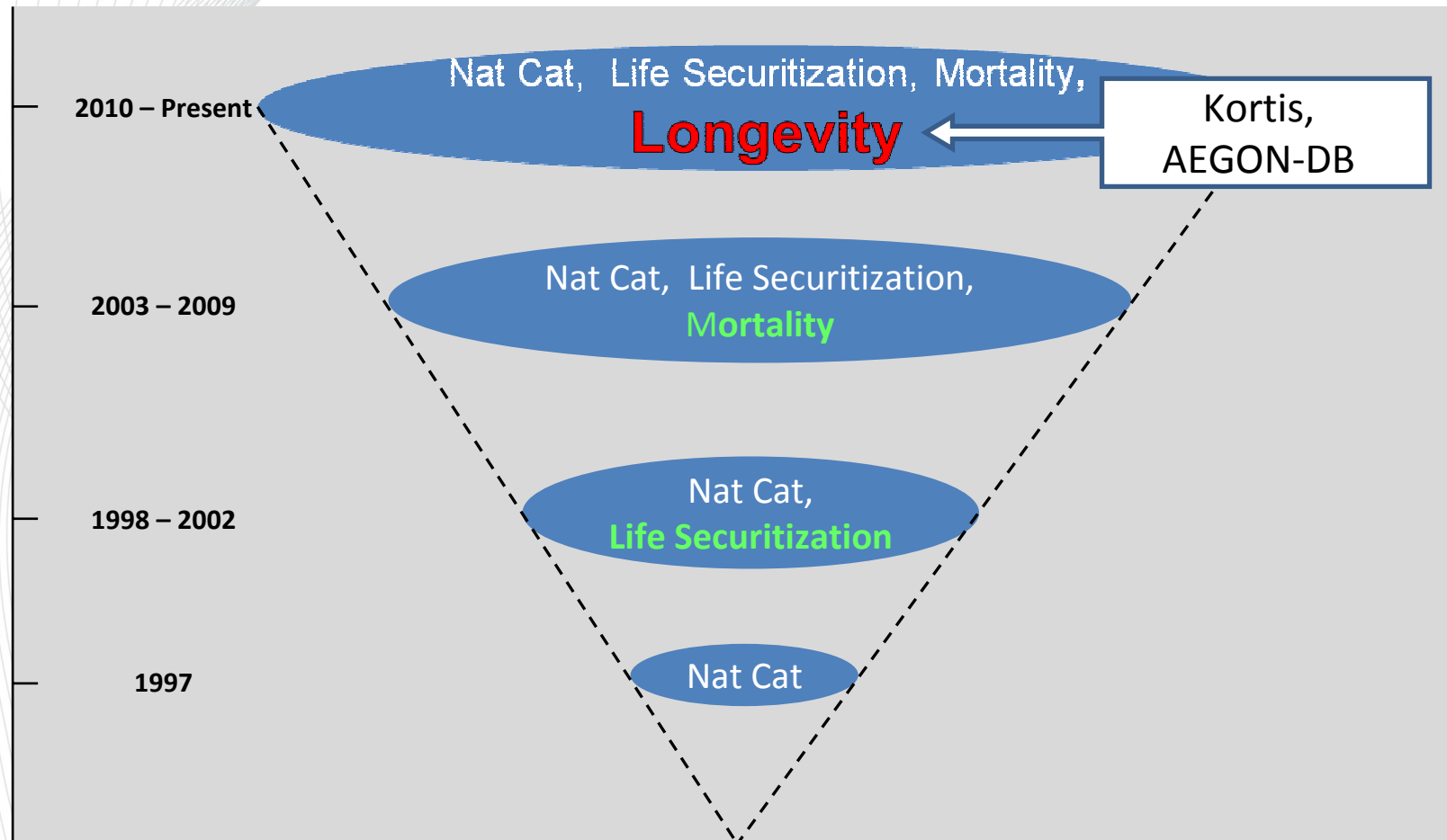
## Regulators

- Regional and Europe Wide regulators need to be well versed and aware of the issues
- Clarify expectations on capital analysis of index-based hedges
- Give appropriate credit for index-based hedges



Real progress has been made...more to come

Evolution of the Insurance-Linked Risk Transfer Market



Source: Deutsche Bank,

\*Nat Cat include Earthquakes, Hurricanes, Typhoons, Wind Storms, Winter Storms, Thunder Storms and other natural disasters



### 3. Questions