



**TOWERS
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TILLINGHAST

A practical framework for facilitating longevity risk transfer

First International Conference on Longevity Risk and Capital Market Solutions

Phil Roberts

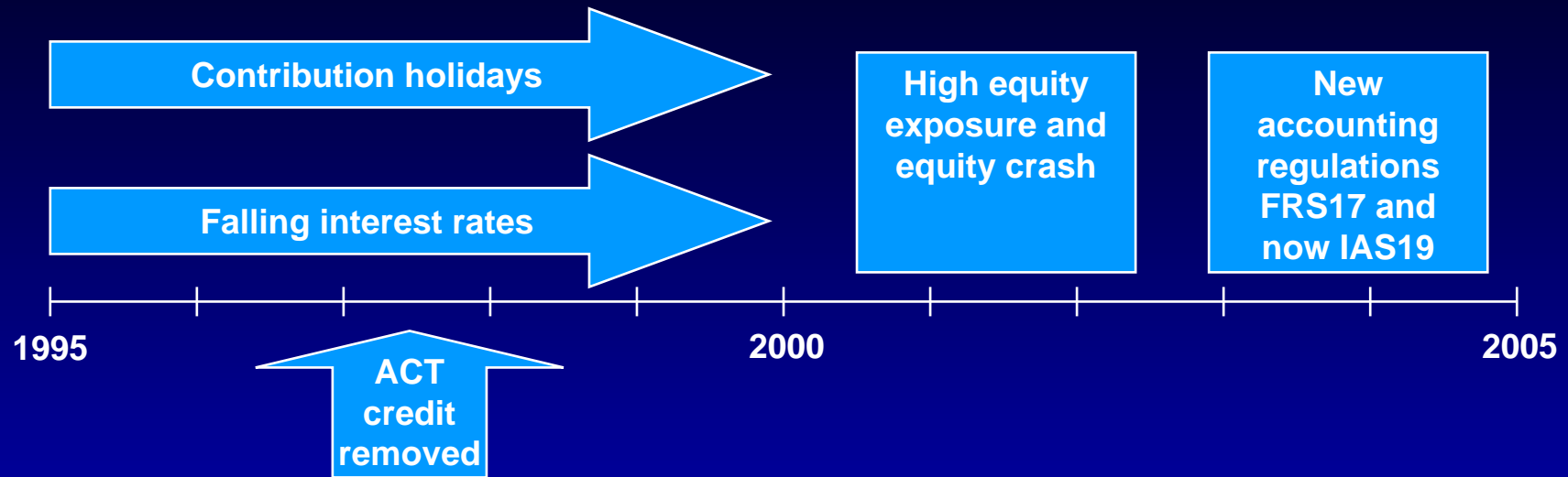
18 February 2005

The annuity writer's position

- Immediate annuity reserves of circa. £70bn
- Low interest rate environment
- Magnitude of further reserve strengthening may lead to capital constraints
- Individual Capital Assessment (ICA) – effective from 31 December 2004
- The effect of the ICA has been to further surface longevity risk for insurers

Solvency II in Europe will also move European insurers to a Risk Based Capital Regime

The pension funds' position



- Total longevity reserves of circa. £750bn
- Greater focus on affordability of pensions and impact on corporate profits
- Pension fund deficits need to be made good
- Impact on corporate governance and decision making (e.g. Allders)
- However pension fund valuation still suffers from less disclosure than life company valuation bases – more bad news on the way (more reality)?

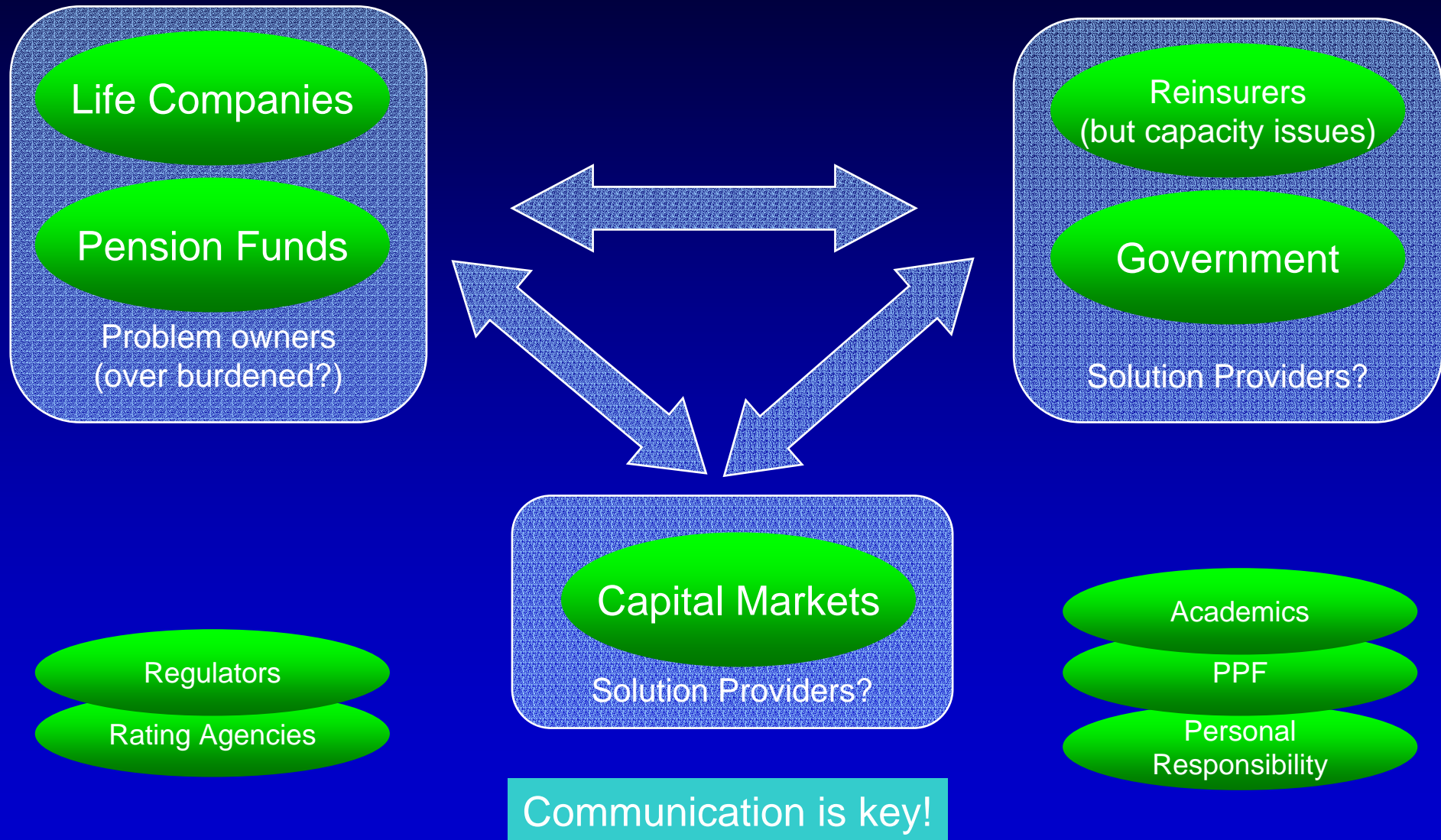
But the perspectives differ

- Life insurers
 - Risk takers
 - Willing to take incremental hits?
 - Seeking protection from catastrophic events
 - Tightly regulated

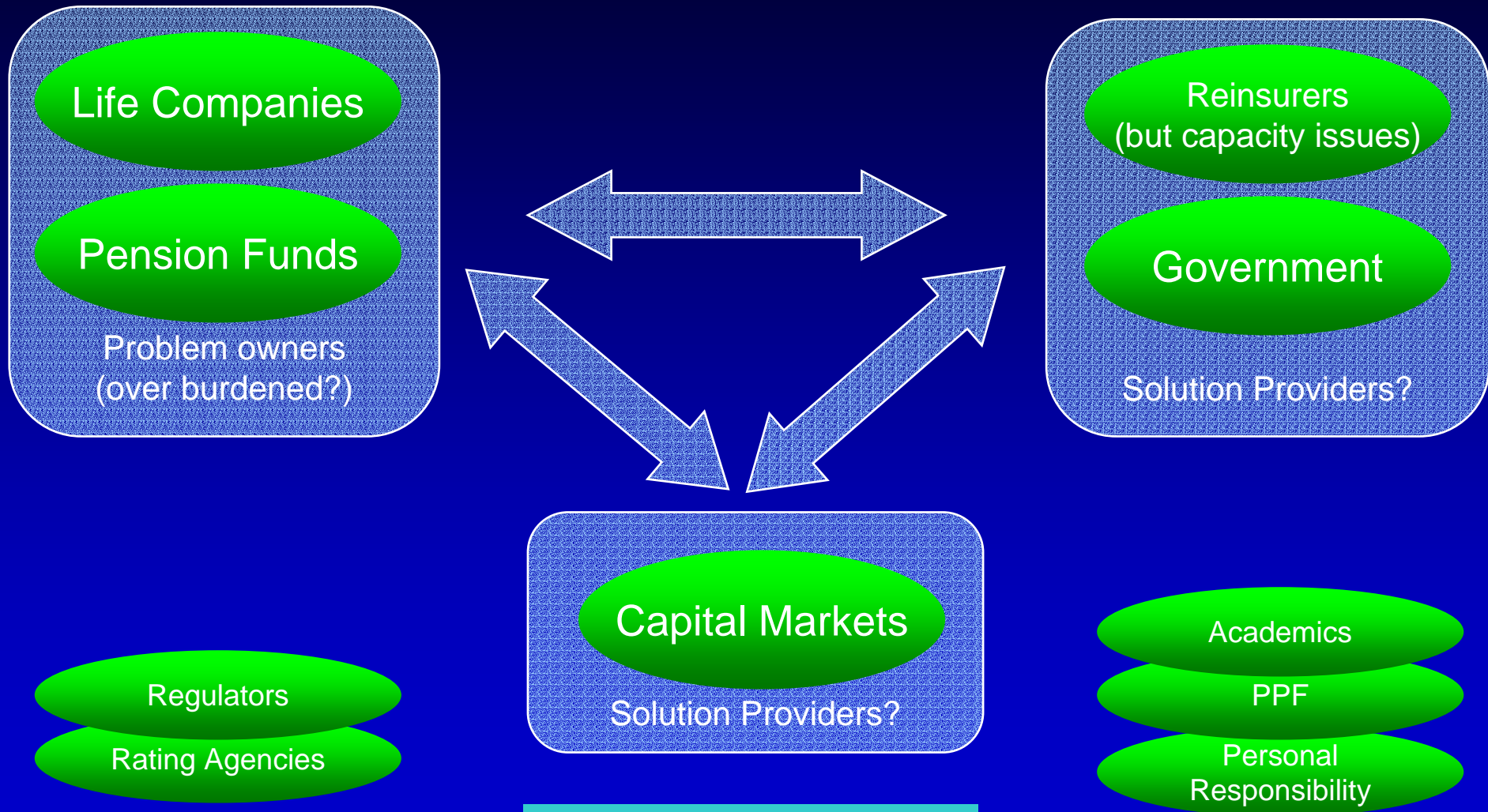
- Pension fund sponsors
 - Risk averse
 - Seeking protect in earnings volatility
 - Incremental losses more important
 - Loosely regulated

Nature (and cost) of solutions very different

Longevity risk transfer – Key stakeholders



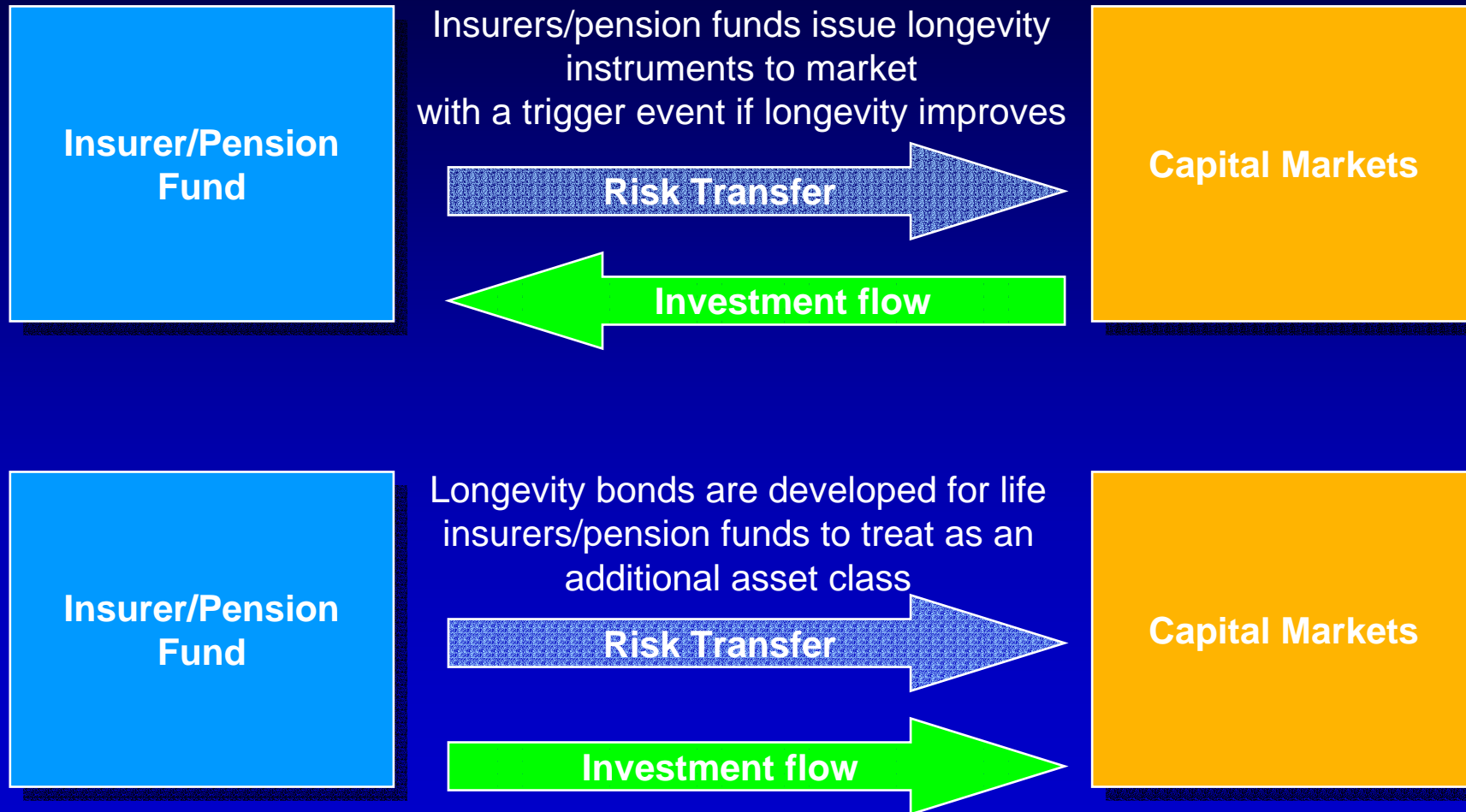
Longevity risk transfer – Key stakeholders



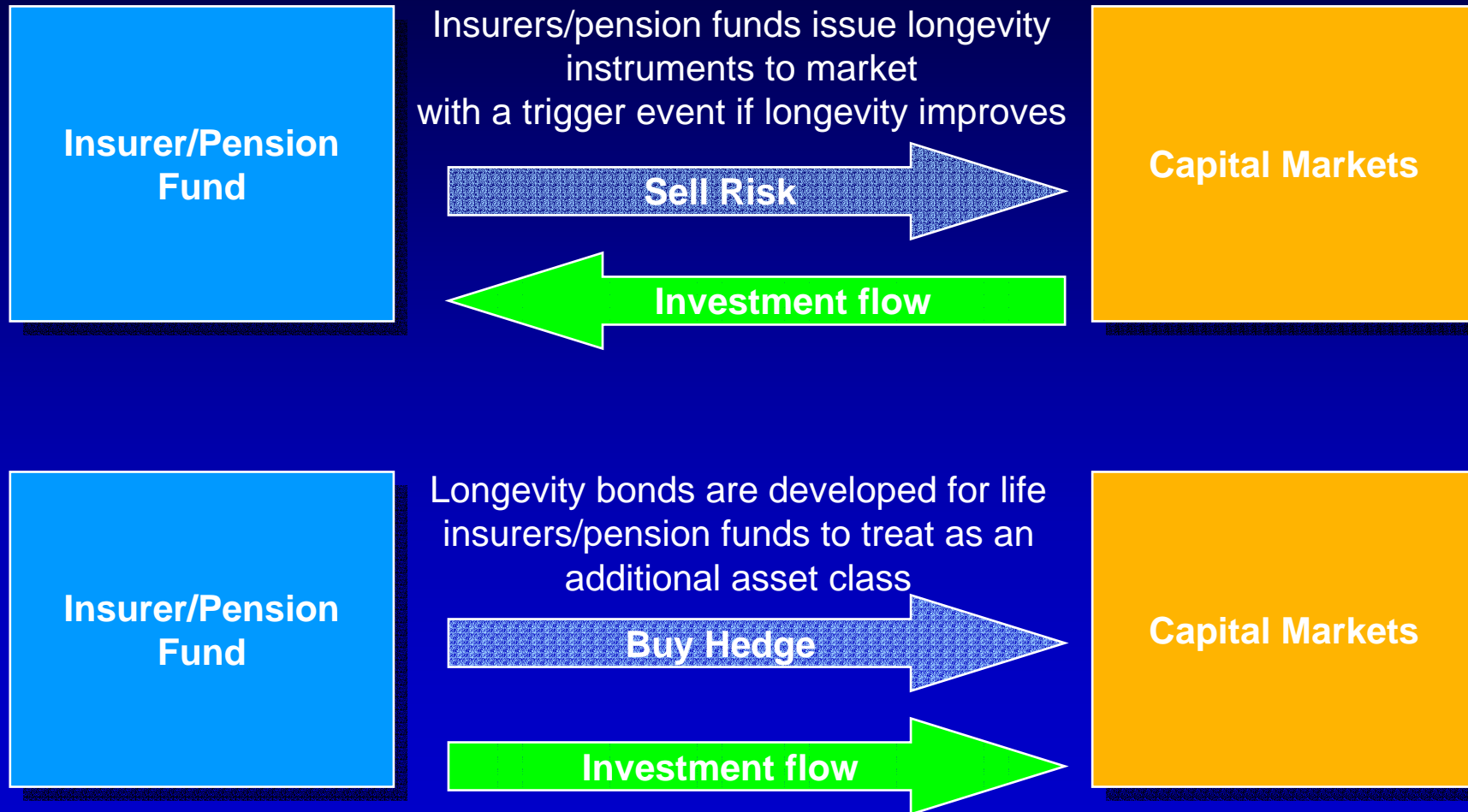
Communication is key!

Perception that the risk is one class – scope for market on a non-correlated risk?

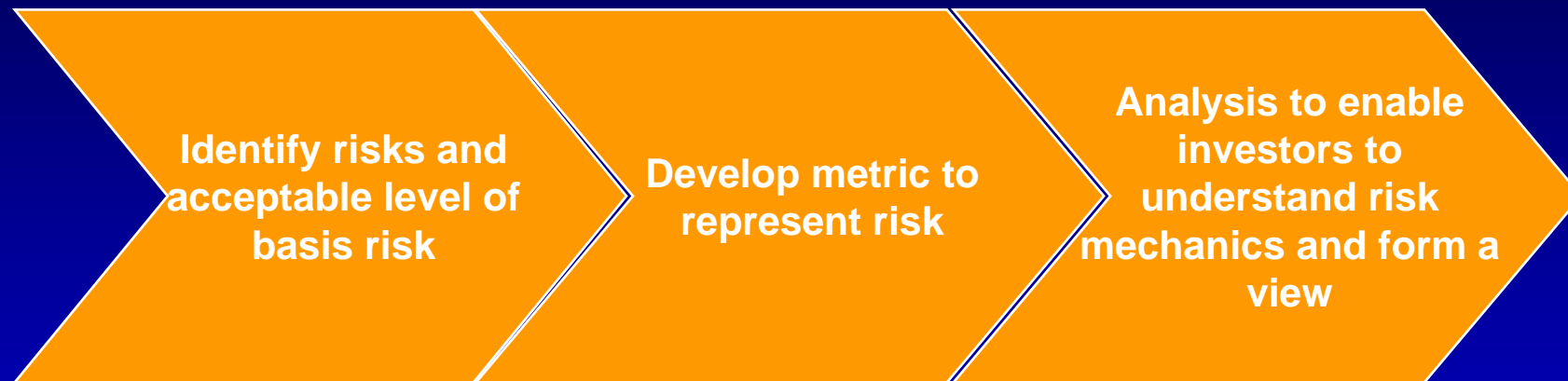
There appear to be two methods to facilitate risk transfer



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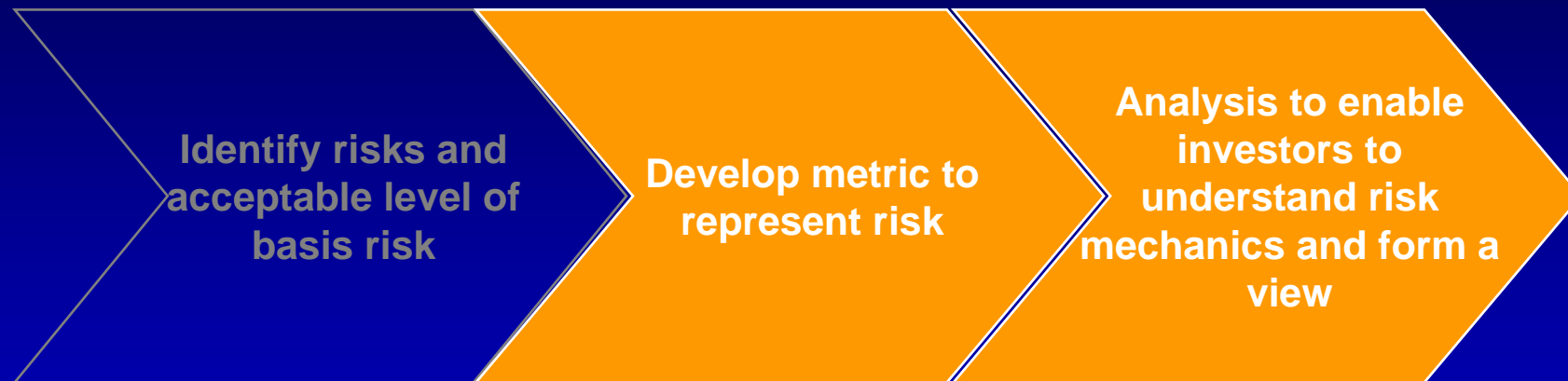


Example transaction process – Key Steps



- Understand the inter-related issues regarding:
 - Regulatory capital
 - Economic effect
 - Structure

Example transaction process – Key Steps



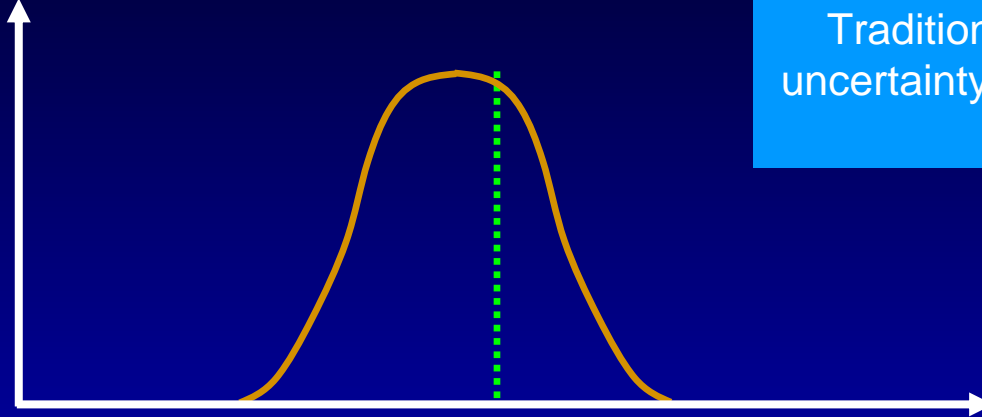
- Understand the inter-related issues regarding:
 - Regulatory capital
 - Economic effect
 - Structure

The capital markets need the tools to take a view

- Mortality models
 - To enable investors to form a view of the risks being undertaken and establish a market
- Mortality indices
 - To provide the reference against which the development of the risk is measured

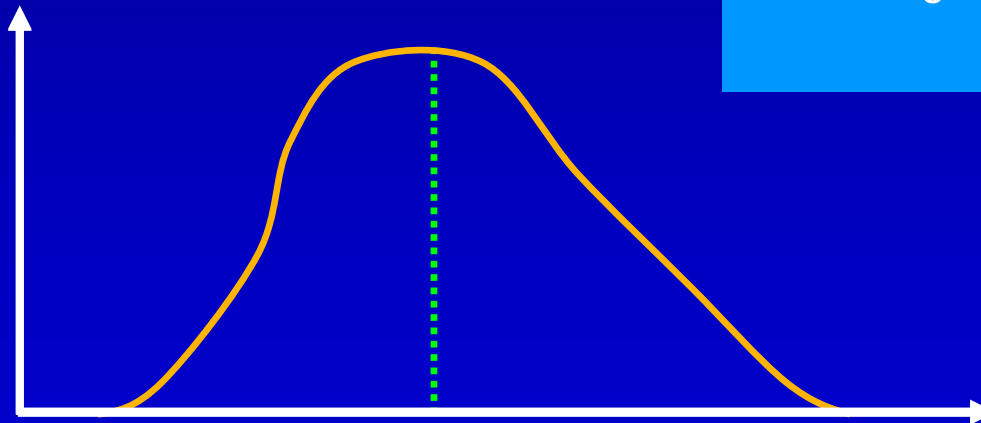
Understanding the risk – Stochastic mortality models

Probability



Traditional actuarial risks deal with uncertainty around a reasonably clearly defined mean

Probability

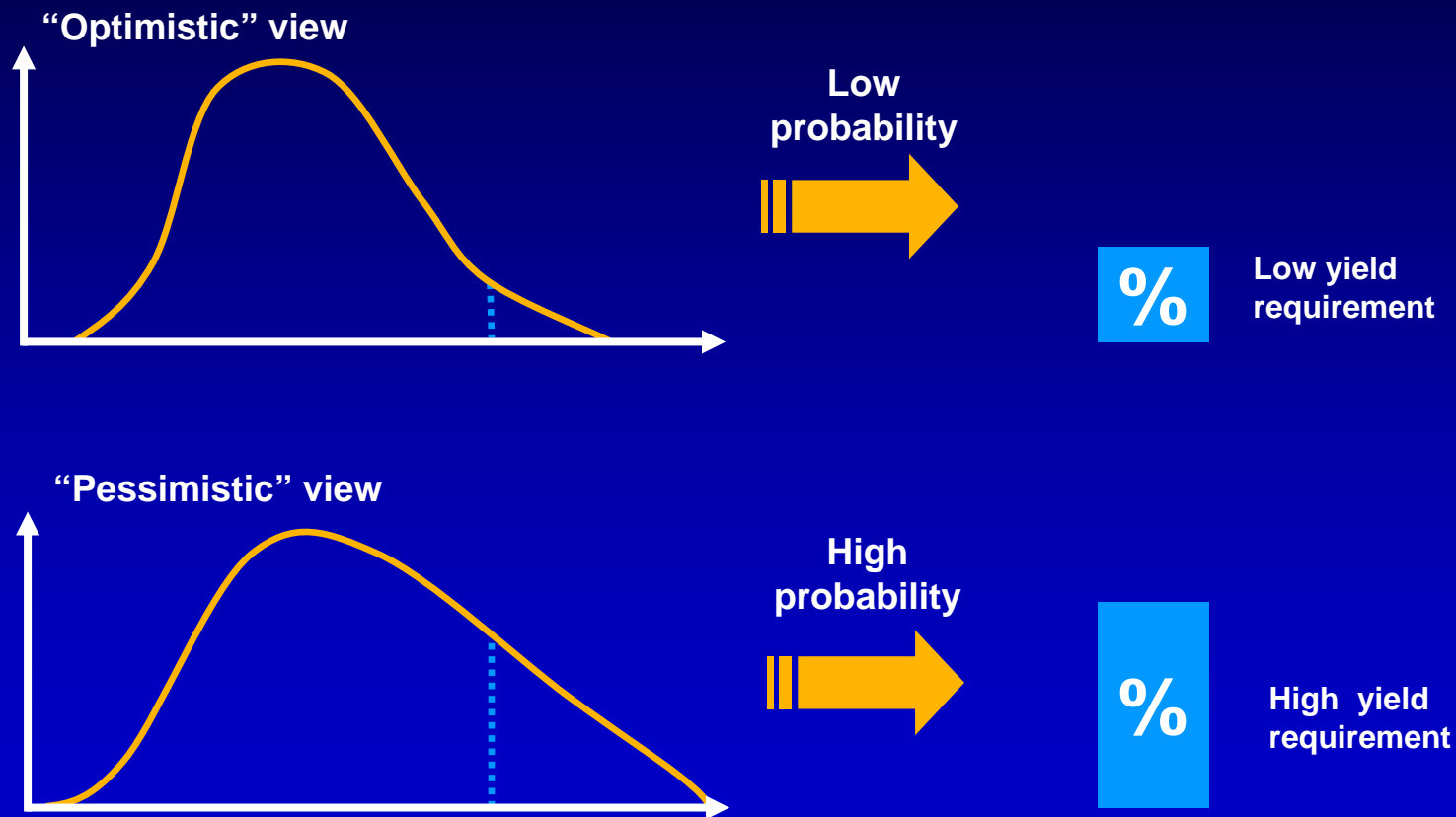


For longevity risk, the mean itself is uncertain

Value of annuity payments

Understanding the risk – Price of uncertainty

We know that the investors view of the future dictates the price they are prepared to pay to accept the risk



The level of this uncertainty is being addressed via mortality research and stochastic mortality modelling (but not definitively resolved)

Understanding the risk – Stochastic mortality models

- Need to recognise there is market scepticism around the tools used to predict future mortality rates due to the lessons learned
- The models being developed are looking to:
 - Give an adequate statistical description of the past
 - Project the trend in future mortality improvements
 - Satisfy reasonability tests and “what if?” scenarios for the future
 - Be understandable
- The models should enable the investment community to form a view on the risks being undertaken
 - Scenario testing will also help

Understanding the risk – Stochastic mortality practicalities

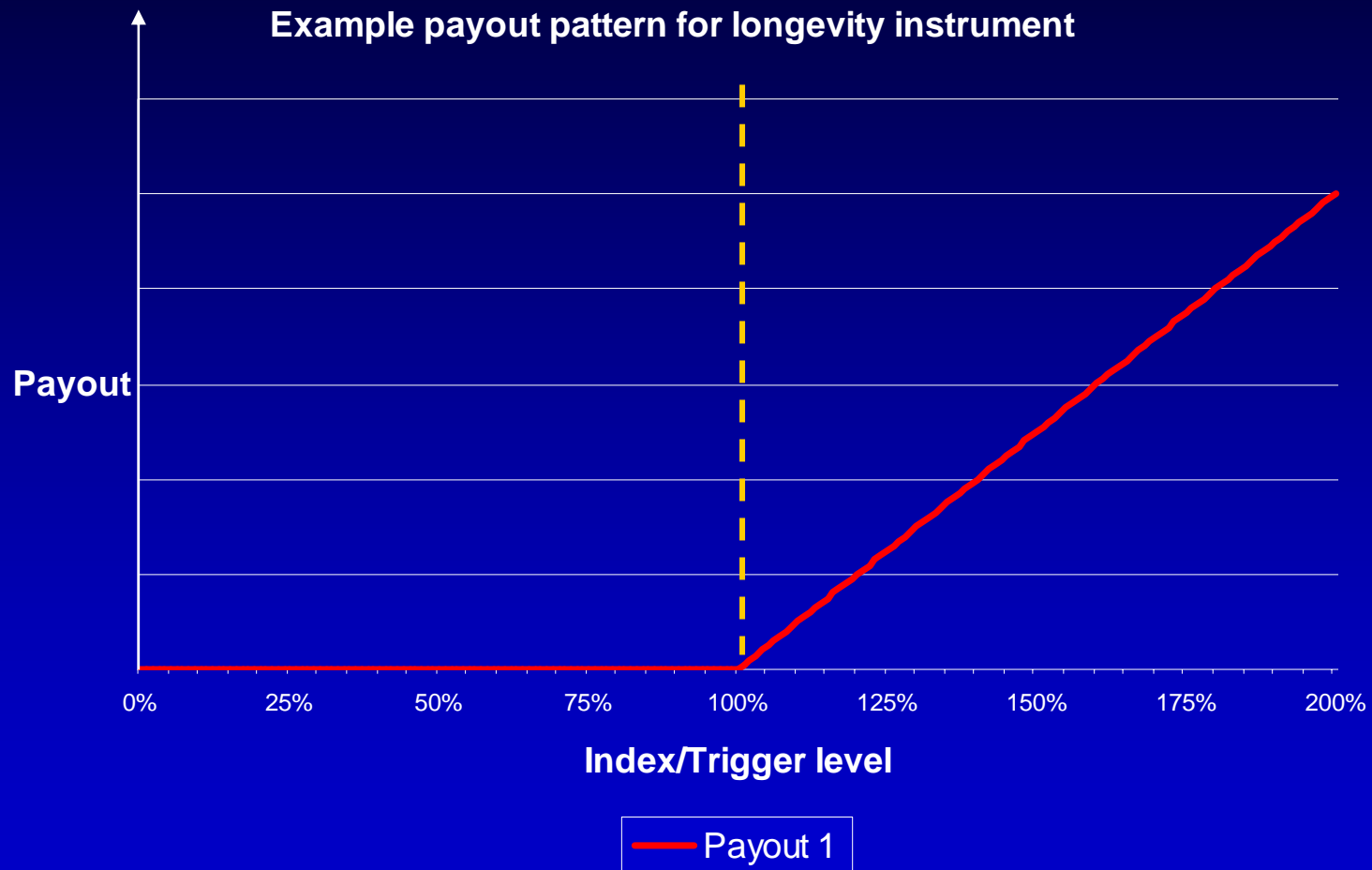
- The CMI have said:
 - *“We believe it is essential that the profession, the FSA and other interested parties recognise the extent to which probability statements about mortality projections may, unavoidably, be based on untestable assumptions and model choices”.*
- In practice it is difficult to remove all subjectivity from mortality projections
- We are a long way from having a generally accepted approach recognised by all parties (does it need to be?)
- Will arbitrage opportunities exist driven by alternative models for pricing longevity risk?

Developing indices

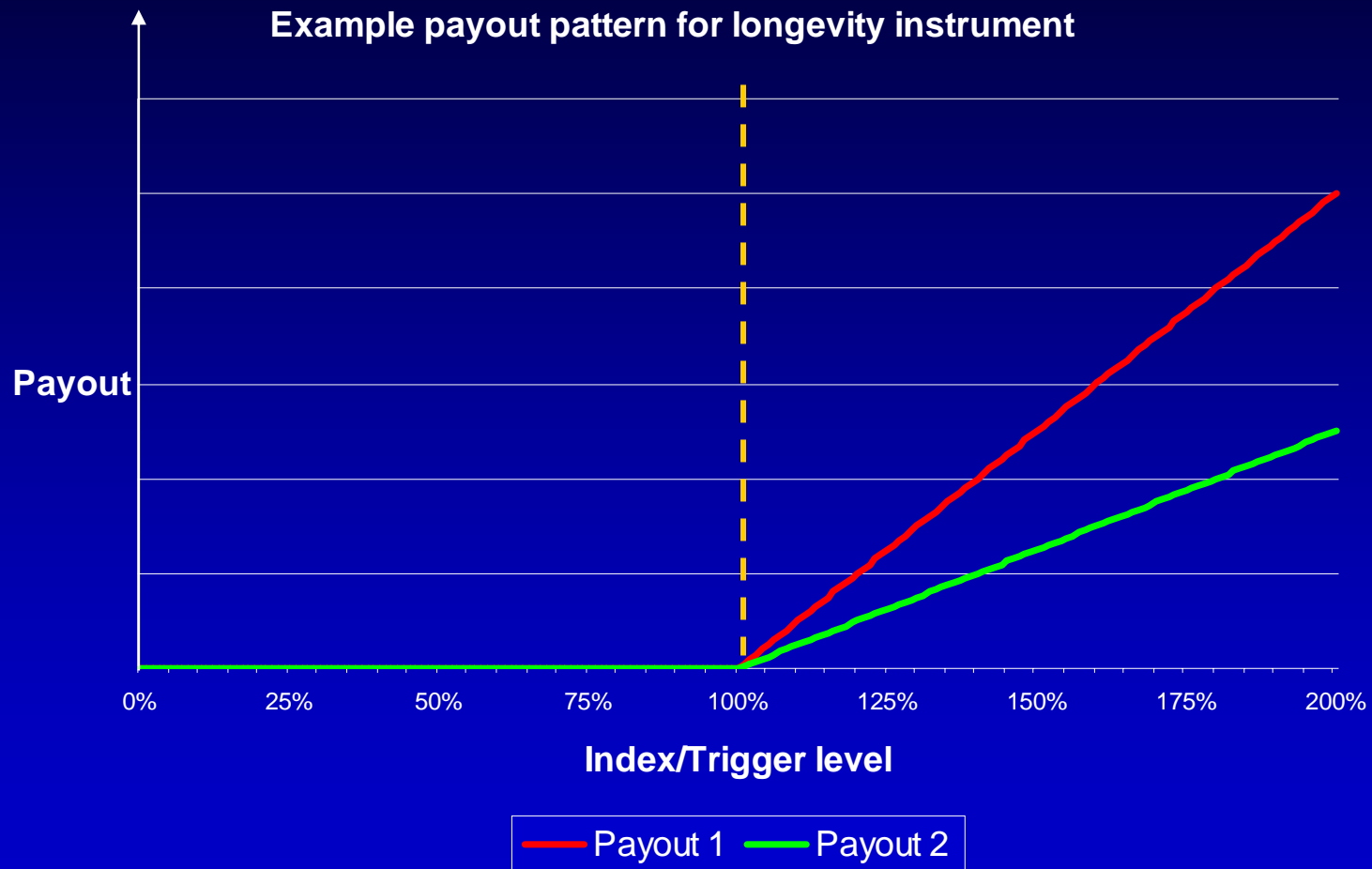
- Indices provide the benchmark against which future mortality rates will be measured
- The development of indices can be embedded in capital market instruments to trigger particular outcomes (see Lin and Cox⁽¹⁾)

(1) Securitization of mortality risk in life annuities

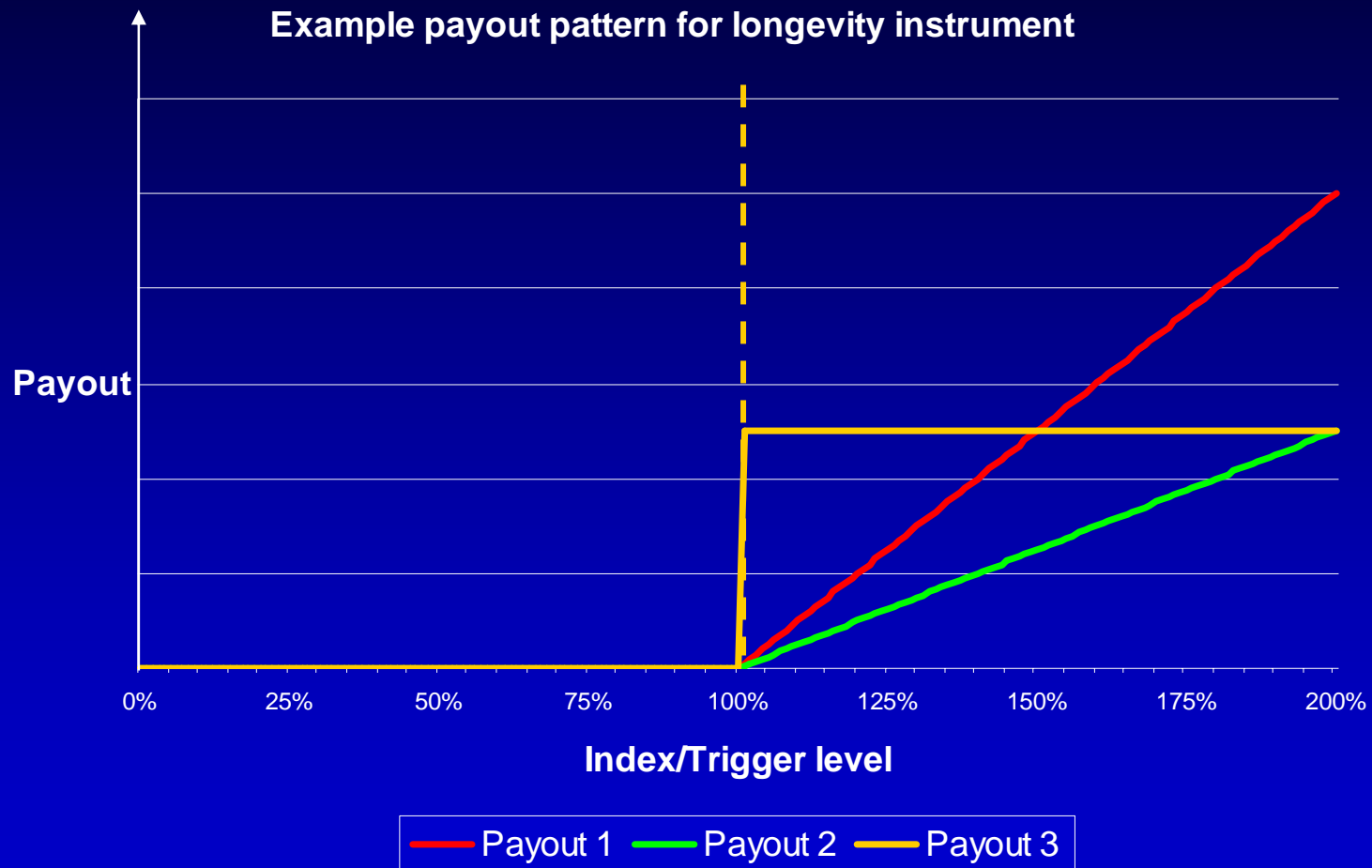
Developing indices - example



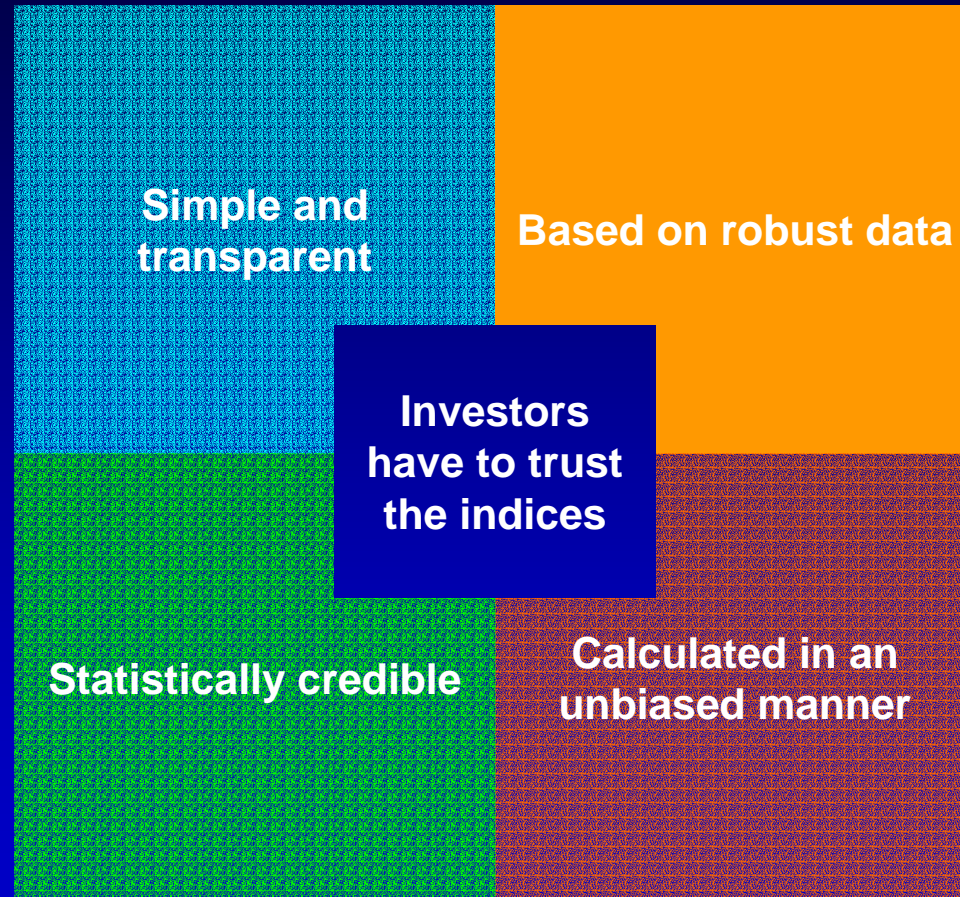
Developing indices - example



Developing indices - example



Developing indices



Developing indices

- Suitable indices may be derived from national statistics:
 - Mortality rates at specified ages; and/or
 - Expectations of life (based on current rates or some projection)
- But these suffer from problems themselves:
 - Time lag issues
 - Introduce basis risk
 - Political interference?
 - Basis for indices may change
- Appoint independent index calculator?

We need to accept that there is no “perfect” solution

- To facilitate a market, compromises are inevitable:
 - Basis risk inevitable and..
 - ..accurate hedges impossible..
 - ..but protection against incremental and catastrophic improvements in longevity should be possible

Accepting these should enable a practical approach to be formulated

Summary

- To develop a successful framework:
 - Credible indices are required
 - Recognise basis risk is inevitable, but this should not preclude the market developing
 - Keep developing stochastic mortality models to inform the pricing debate
 - Understand the instrument:
 - Regulatory
 - Economic
 - Structural

A lot of challenges – but not insurmountable?



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