

Running life insurance business under market valuation and increased longevity

Lessons learned from the Danish sector and looking forward

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Running life insurance business under market valuation and increased longevity

- Lessons learned from the Danish sector and looking forward

13th Art of CRO conference, The Geneva Association
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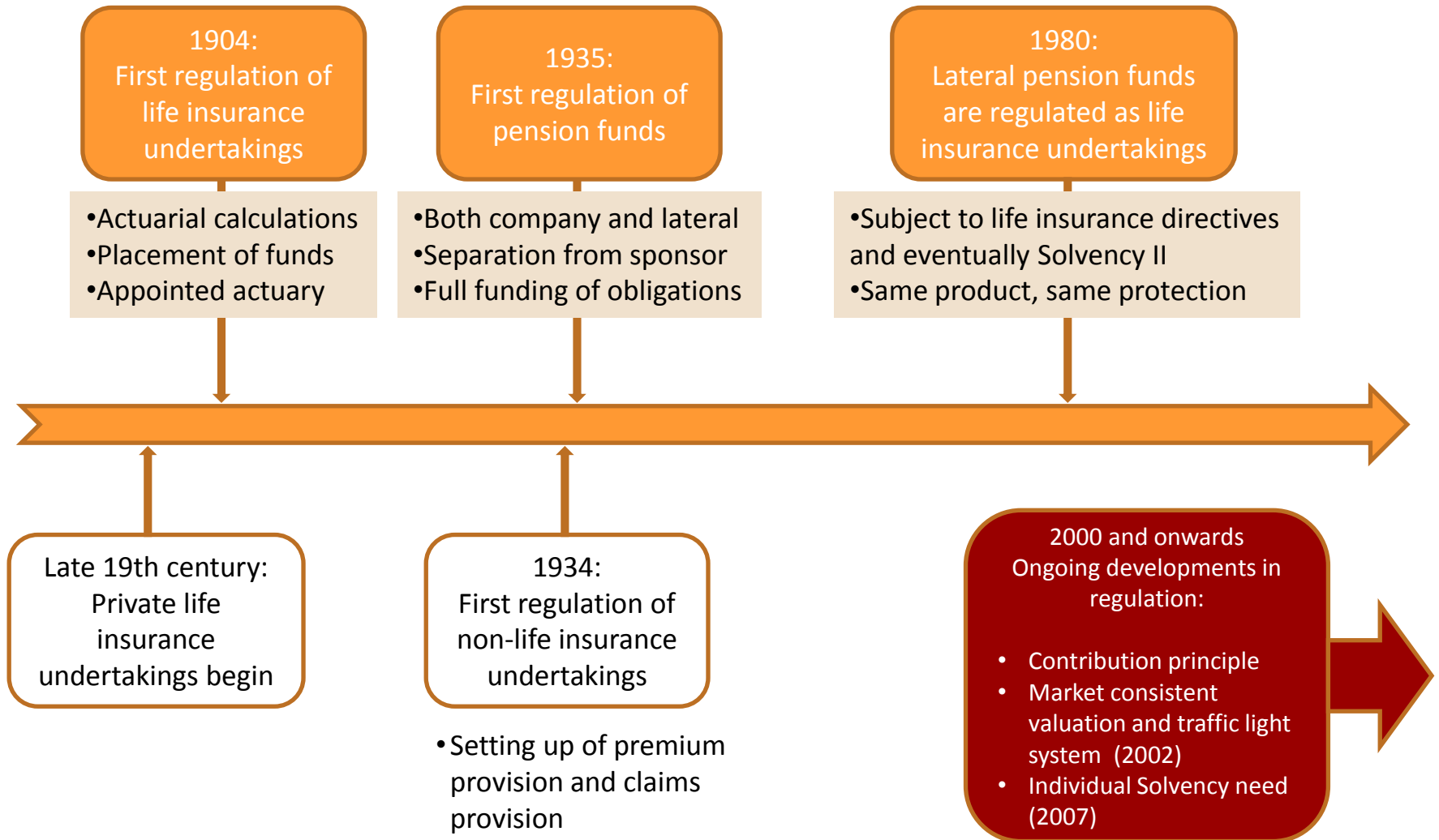
Jan Parner

All have important responsibilities for policyholders



Short term solutions may cause long term problems

The history of Danish regulation



1935-regulation is a core difference to other countries

Will speak on...

Topics to be covered

- Sectorial overview and risk themes
 - Market valuation and the risk free rate
 - Traffic light system – a communication tool
 - We all live longer...
 - Alternative investments - the hunt for yield
 - Fairness
-

SECTORIAL OVERVIEW AND RISK THEMES

Background info

DK market

- Life insurance and (occupational) pension funds are under the same regulation
- More than 98% is DC-scheme
- Market valuation since 2002 and risk based capital regulation since 2009
- Assets of 360 bEUR as of Q3 2015 (excluding Pilar 1bis)
- Fairness regulation
- Most products consists of a insurance risk element and a savings element
 - Historically the typical product was a guaranteed nominal average interest rate product
- Low risk of mass lapses due to tax barriers helping long term investment perspective

End of 2015 savings (all three pillars) exceeds 170% of GDP

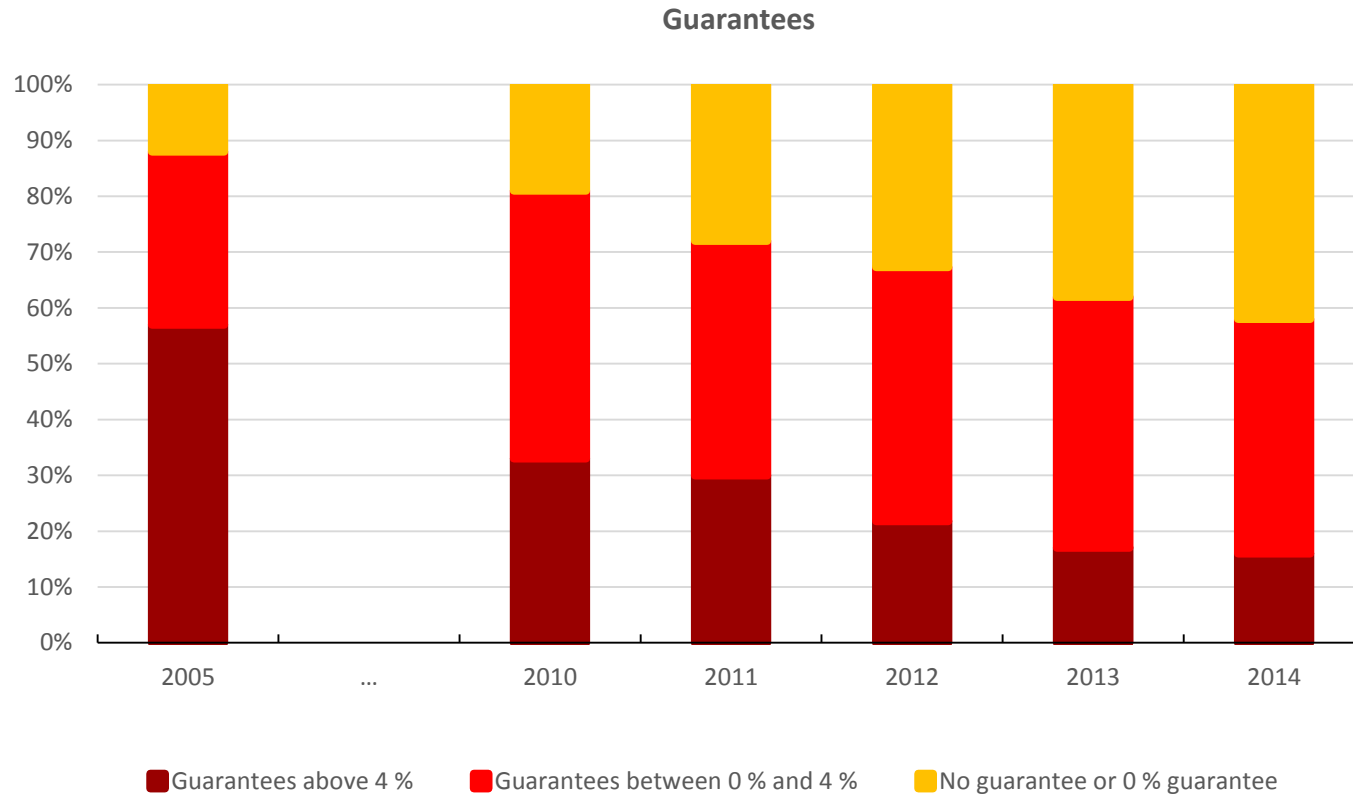
Sectorial themes over time

10 year Danish Government bond rate



Reselection of pension schemes lead to increased risk budget

Development in guaranteed rates

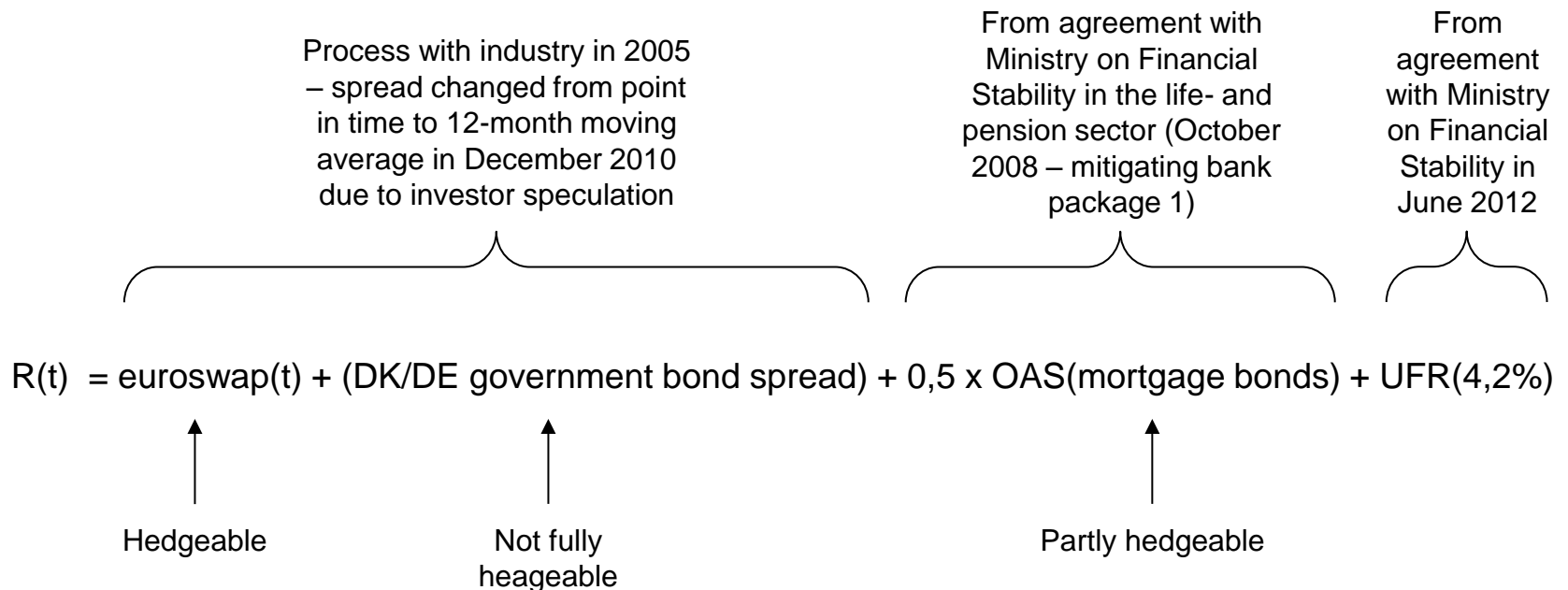


Sector selling off interest rate derivatives to cash-in and reallocate

MARKET VALUATION, RISK FREE CURVE AND IMPACT

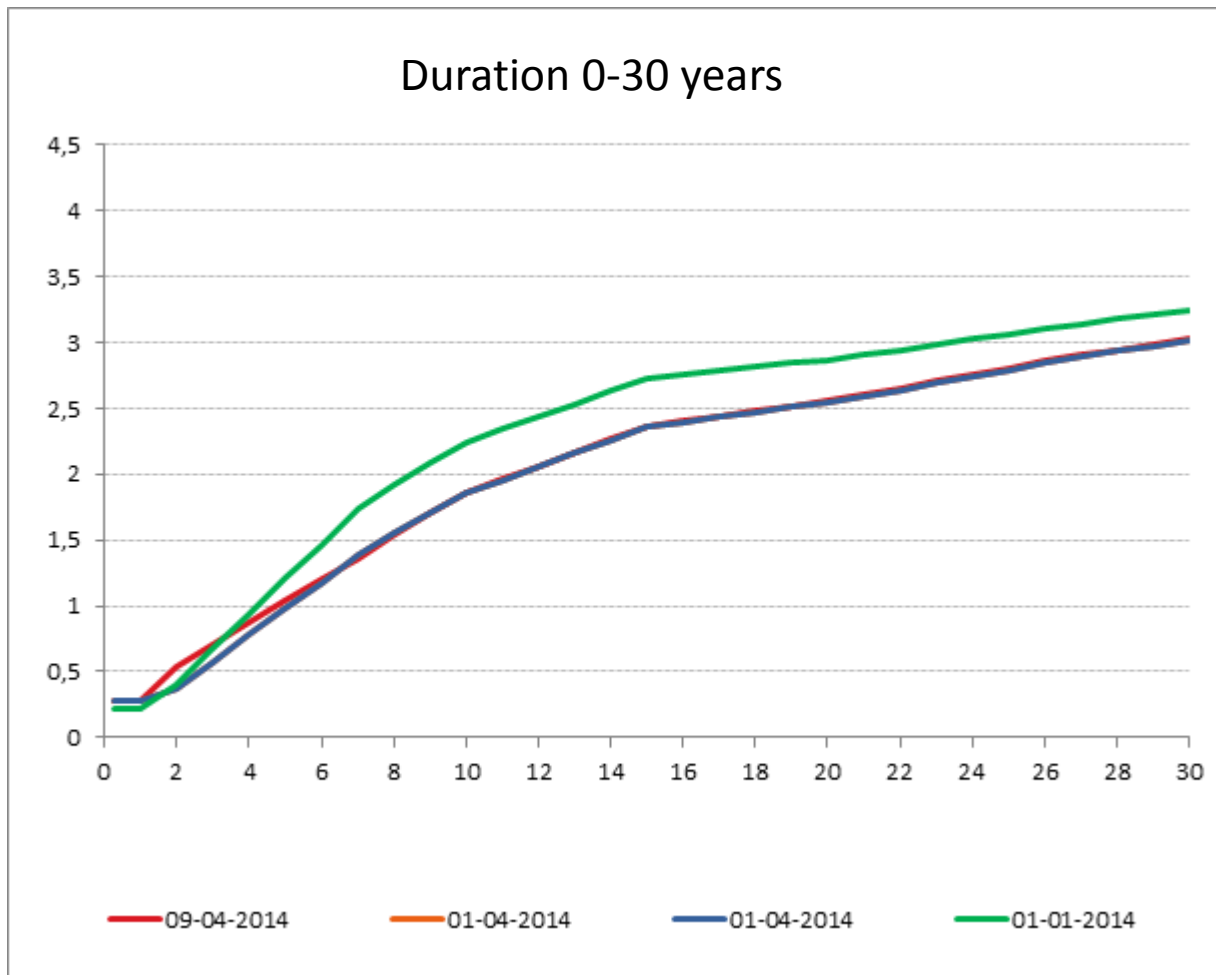
Construction of the risk free rate before Solvency II

- From 2002-2005 based on selected government bonds – lead to mispricing due to hedging and lack of liquidity
- From 2005 and onwards based on euroswap rates
- Liabilities discounted using risk free rate $R(t)$



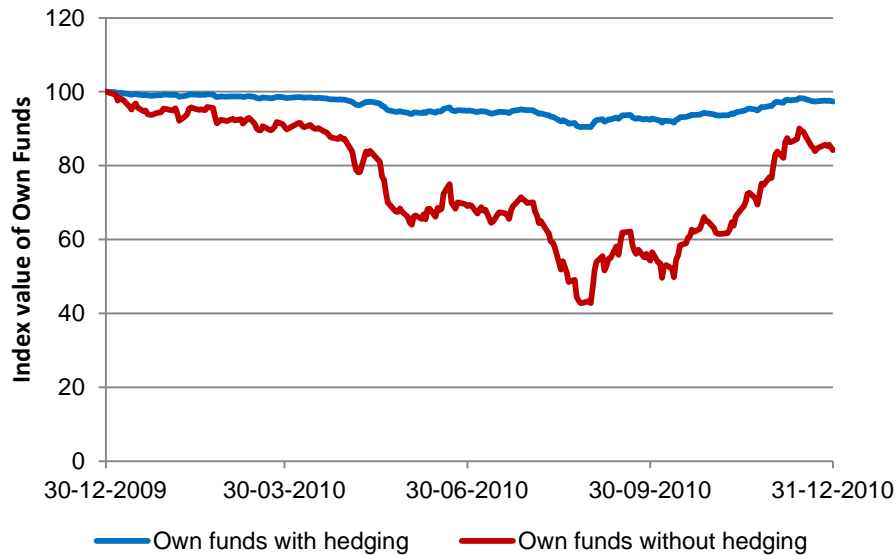
Active hedging against regulatory curve

Published by the Danish FSA on a daily basis



Active hedging against regulatory curve

Market valuation and hedging in practice



The difference between the red and the blue curve is covered by a hedging strategy

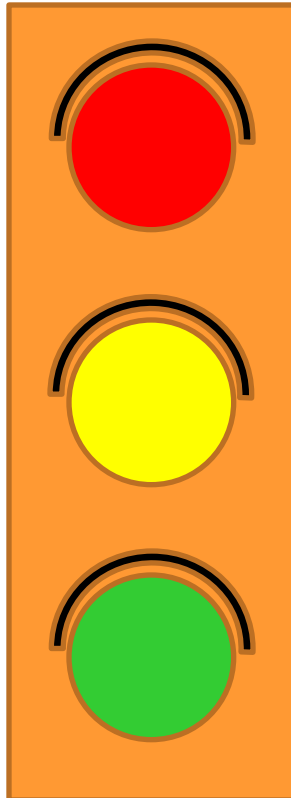
Asset allocation as at end of 2009	
Equities	18 %
Government bonds	27 %
Covered bonds	34 %
Corporate bonds	6 %
Property	8 %
Other	7 %

Illustrations are based on information from all Danish life insurance undertakings and lateral pension funds

Hedging can reduce volatility in own funds significantly

TRAFFIC LIGHT SYSTEM - A COMMUNICATION TOOL

Market surveillance on a daily basis - Traffic light stress test



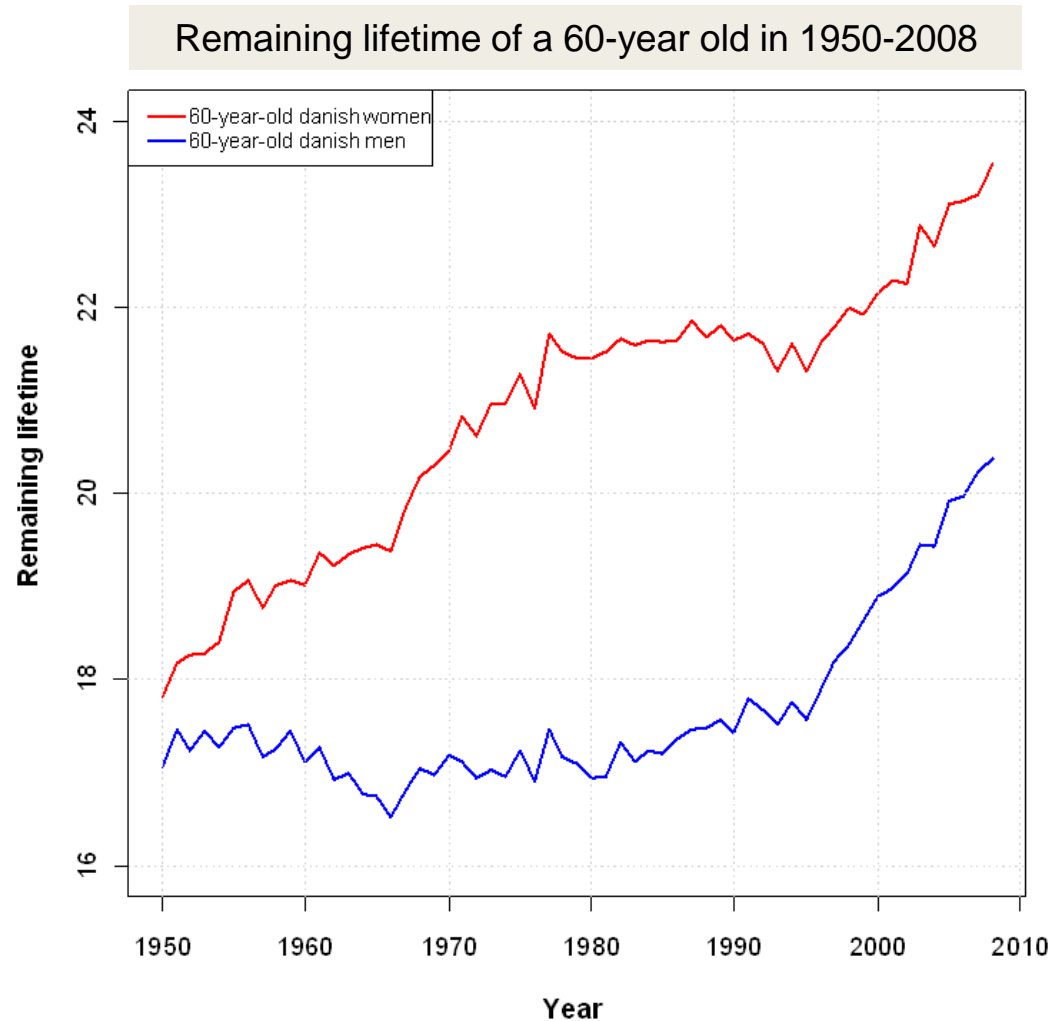
- Interest rate risk: 0.7 perc.point
- DK-DEU spread risk: 0.17 pp
- Equity risk: -12 per cent
- Commodities risk: -18 per cent
- Real estate risk: -8 per cent
- FX risk: 99 per cent
- Credit and counterpart risk: -8 procent

- Interest rate risk: 1 perc.point
- DK-DEU spread risk: 0.25 pp
- Equity risk: -30 per cent
- Commodities risk: -45 per cent
- Real estate risk: -12 per cent
- FX risk: 99 .5 per cent
- Credit and counterpart risk: -8 procent

Not red or yellow light

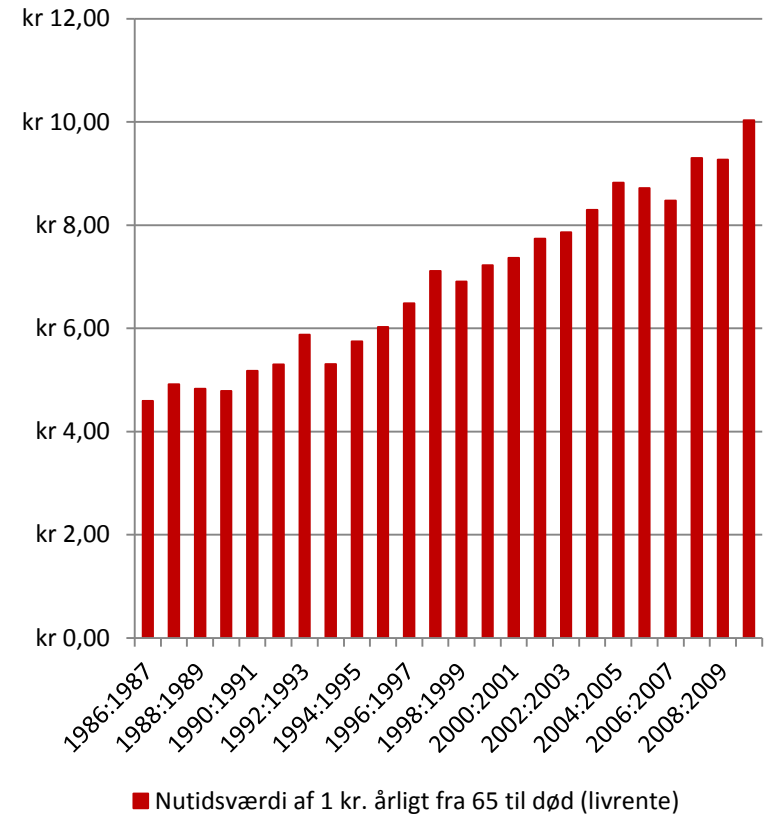
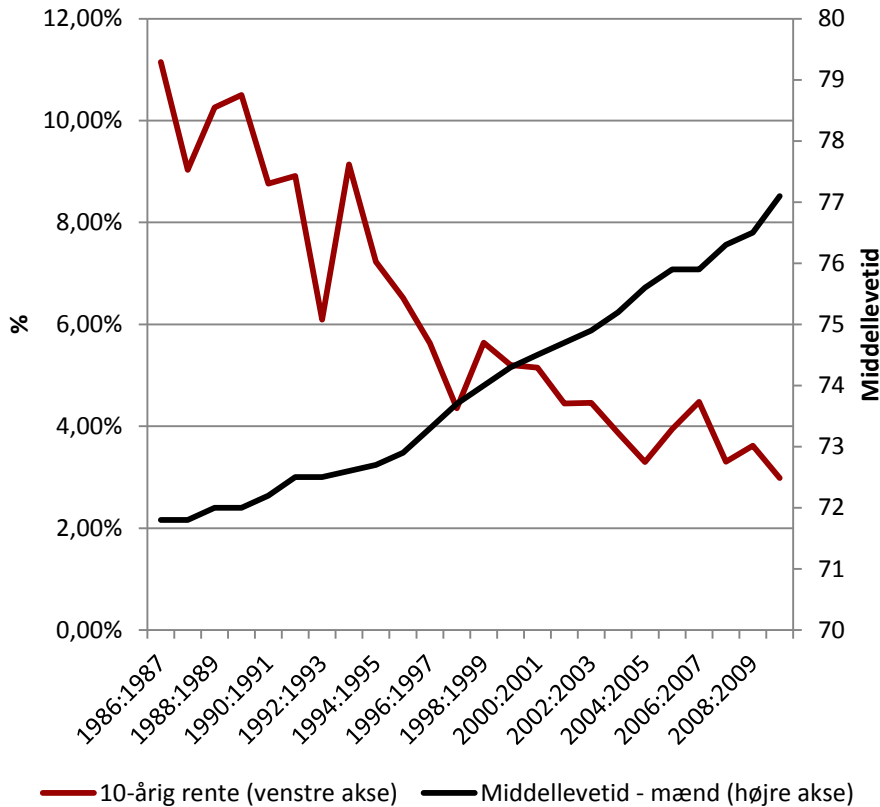
WE ALL LIVE LONGER...

Historic mortality developments



Improved life expectancy

Material risks in life insurance



Present value of annuities substantially increased over decades

The Danish FSA longevity benchmark

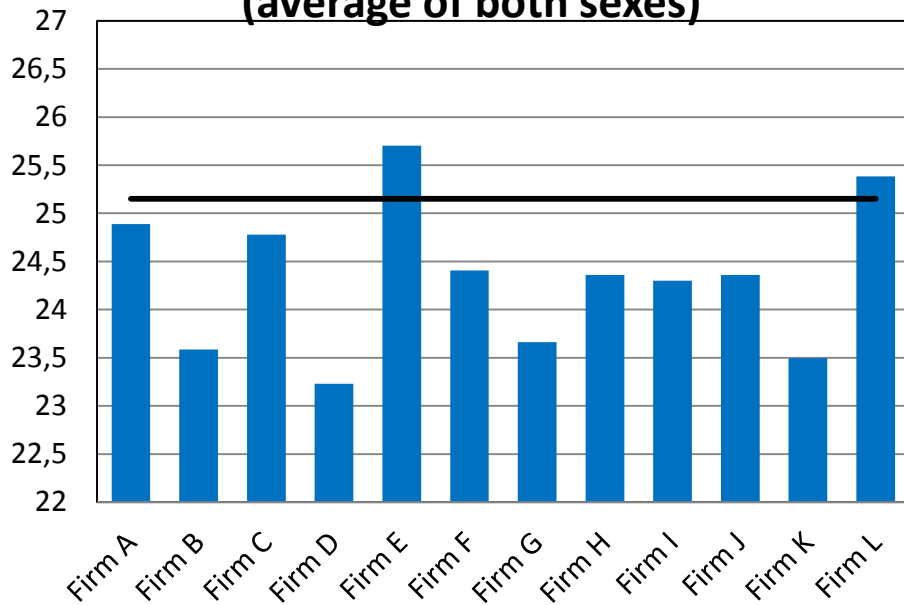
Technical provisions:

” Provisions for insurance liabilities shall be calculated taking into account what can reasonably be foreseen as adequate...”

- Danish mortality and longevity benchmark published by Danish FSA end 2010
 - The benchmark is the Danish FSA’s interpretation of what can reasonably be foreseen
 - The purpose was to secure adequate technical provisions and ensure level playing field in competition
 - Analysis initially based on Lee-Carter model, later simplified for presentation
 - Statistical test for deviation from benchmark
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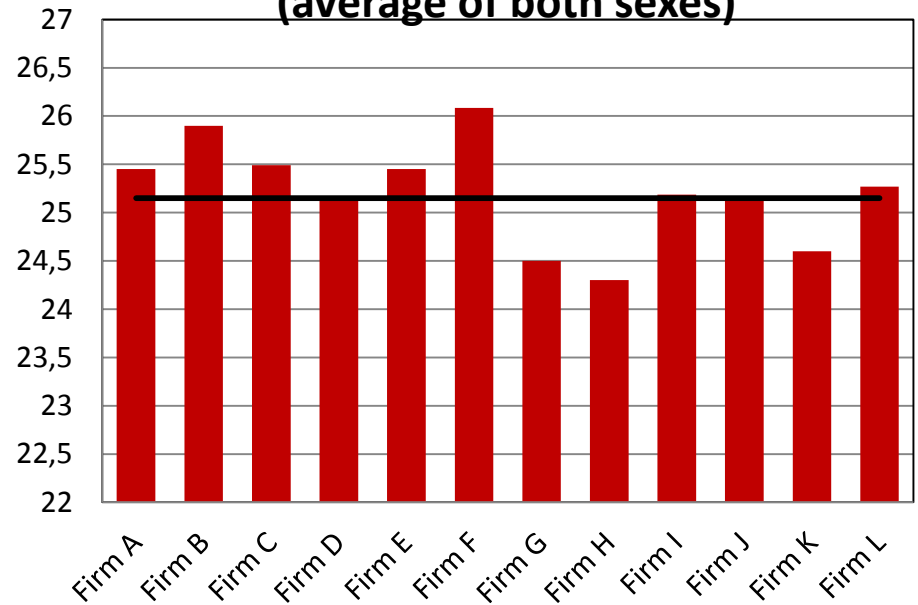
Remaining life expectancy for 60-year-old

**Remaining life 60-year-old before benchmark
(average of both sexes)**



■ Remaining life - based on the firms own method and data
 — Remaining life - FSA Benchmark

**Remaining life 60-year-old after benchmark
(average of both sexes)**



■ Remaining life - FSA Benchmark adjusted in accordance to the firms population mortality
 — Remaining life - FSA Benchmark

Benchmark not initiated by the responsible actuaries

ALTERNATIVE INVESTMENTS – THE HUNT FOR YIELD

The hunt for (the lost) yield...

Things are changing these years

- Growth is low
- Yield is low
- Financial markets acts differently
- Yield has to be found in new places...

Interest rate 10-year Danish Government Bond



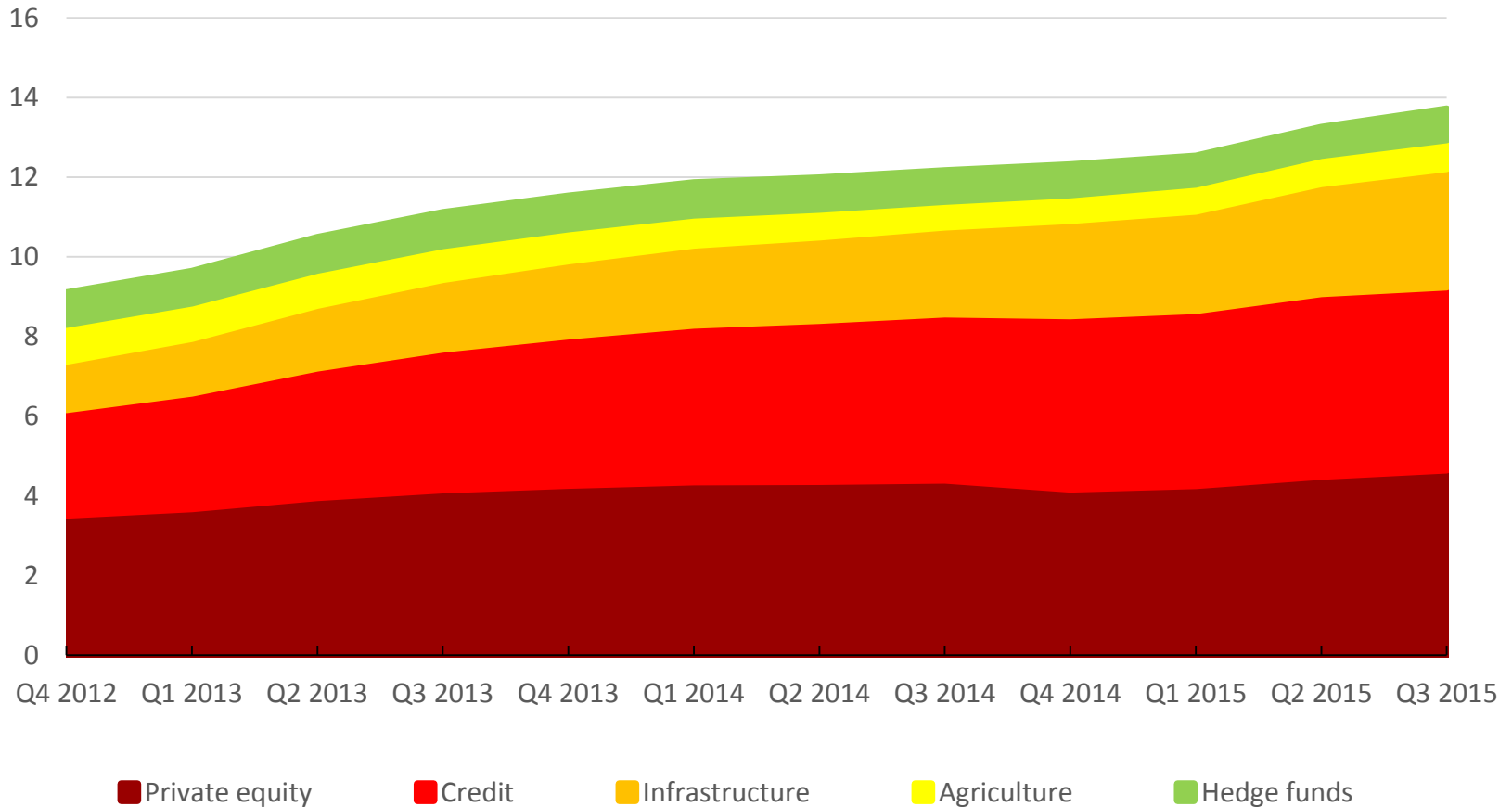
Source: The Danish Statistical Bureau

How to deal with the business going forward?

Development in relative investment allocation into alternatives

Alternative investments

Per cent of total investment assets



“Credit” also includes peer-to-peer lending

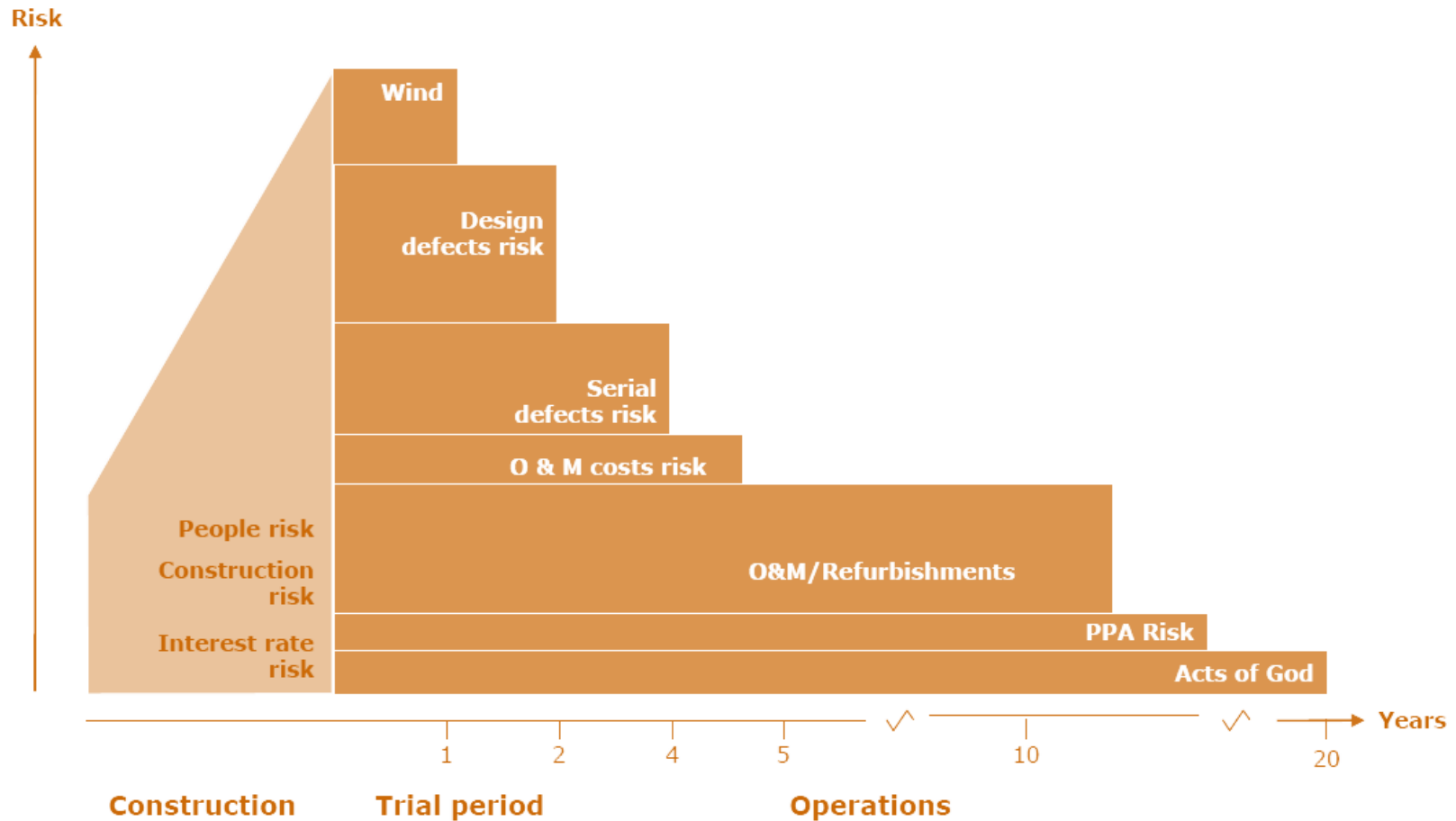
Alternative investments survey in 2013 H1



- Investments are concentrated in few companies (at the end of 2012).
- The companies should make more extensive assessments of the liquidity premium linked to alternative assets.
- The companies should generally focus more on the risks of alternative assets.
- In some cases the companies can be more critical in relation to their regular valuation of alternative investments.

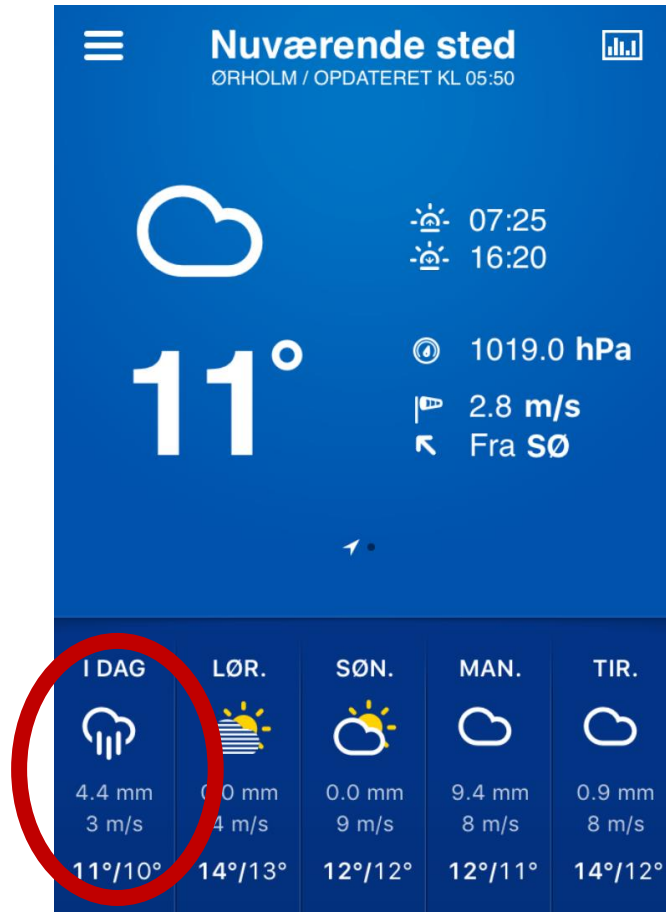
Are the risks taken adequately rewarded?

When to validate underlying assumptions?



And which risks are transferred to the investor?

Things do not always turn out as expected



... and it is important to revisit core assumptions

FAIRNESS

Think about the lottery...



and the possibility of a big win

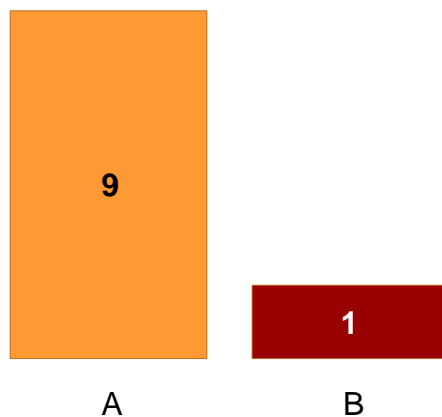
What do you consider being fair?

- You have shared a coupon with another friend.
- You are paying 10 € and your friend is paying 90 €
- Saturday comes and you have got a winning coupon. Together you win 10000 €
- How to you split the win?
 - Half and half?
 - 1:9 i.e. he gets 9000 € and you get 1000 € (the principle of contribution)
 - Is it important that one of you is old and the other is young?

What is considered “fair” is typically a cultural norm

Fair treatment of the policyholder

- DK regulation stemming from 1929 (or perhaps earlier), “The technical basis for calculation has to provide a fair treatment of the policyholder”
- For with-profit contracts, unless agreed by occupational pension fund parties (if applicable), they have to obey to the principle of contribution both between own funds and policyholders and between the individual policyholders
- Example. A holds 9 units, B holds 1 unit. Any surplus or deficit is then distributed as 90% to “A”, 10% to “B”.

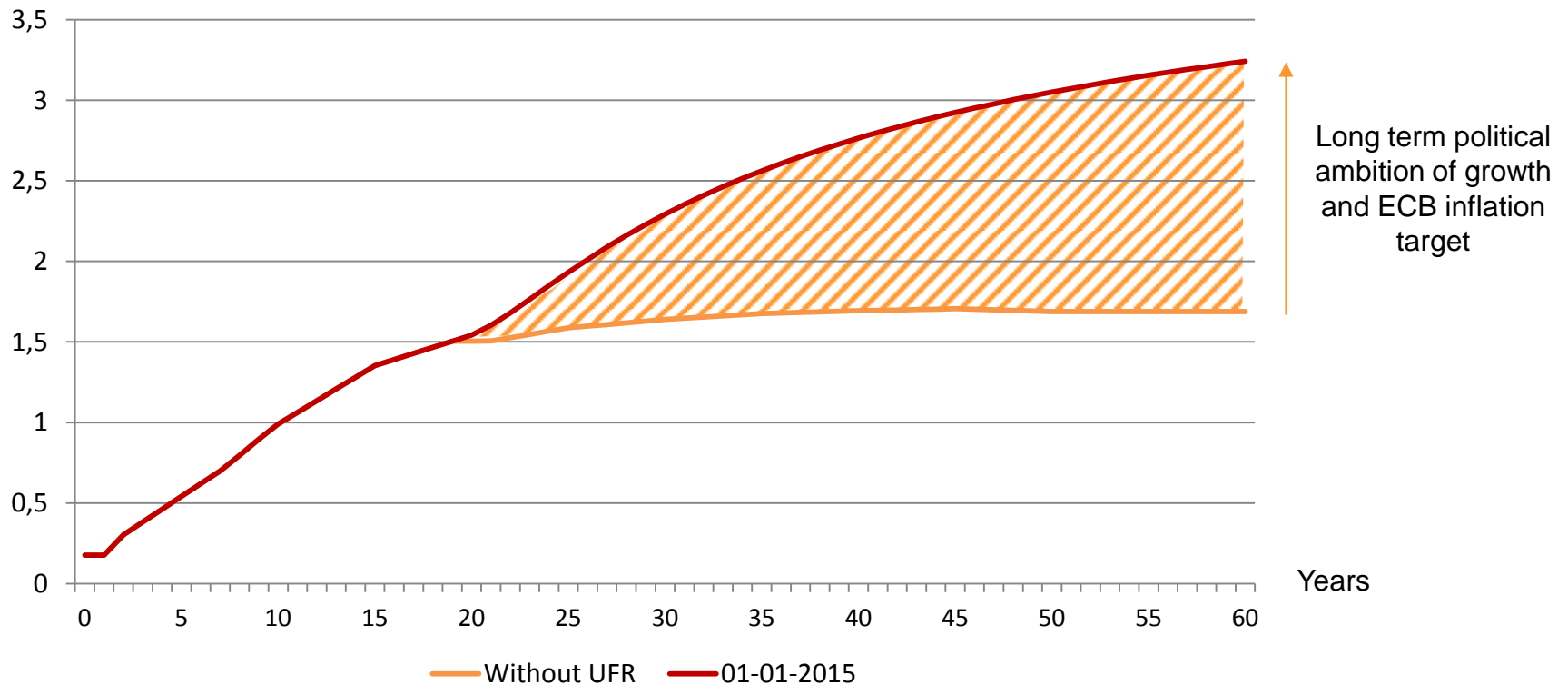


Fairness is not like a bank account with a 1:1 unit metric

GUARANTEES OR NO
INTERGENERATIONAL TRANSFERS
– WHO WILL WIN?

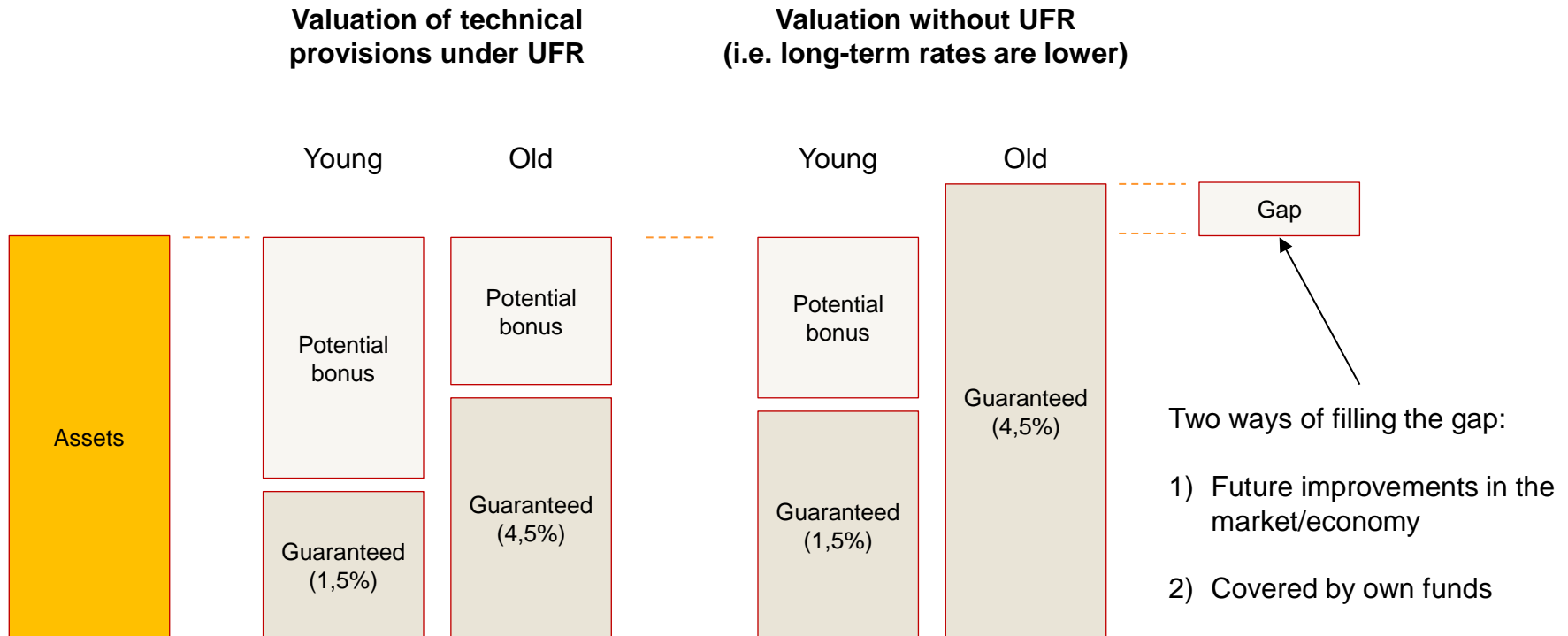
Present value of technical provisions

Interest rate



But what happens to fairness if targets are not met?

Valuation with and without UFR

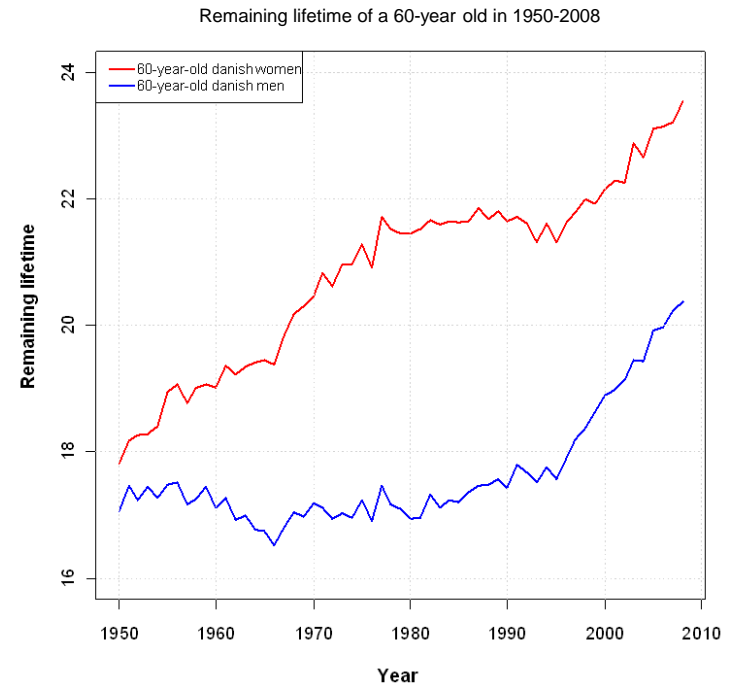


- Due to the historical decline in "maximum allowed interest rate" products with high guaranteed rates are held by older policyholders and products with low guaranteed rates primarily by young policyholders

Heuristically: we intervene when own funds cannot close the gap

UFR and the risk of intergenerational transfer

- Japanese scenario of long low interest rates and Solvency II UFR assuming 2% inflation, 2.2% growth
- Shadow monitoring by use of a more market based metric (risk free rate), intervening when own funds measured under UFR has been used up
- Important whether regulation/supervision contains individual policyholder fairness or is more focus on solvency of the undertaking
- The risk of intergenerational transfer is amplified as longevity increases



The non-sustainability of high guarantees is testing fairness

Which principle is the strongest?

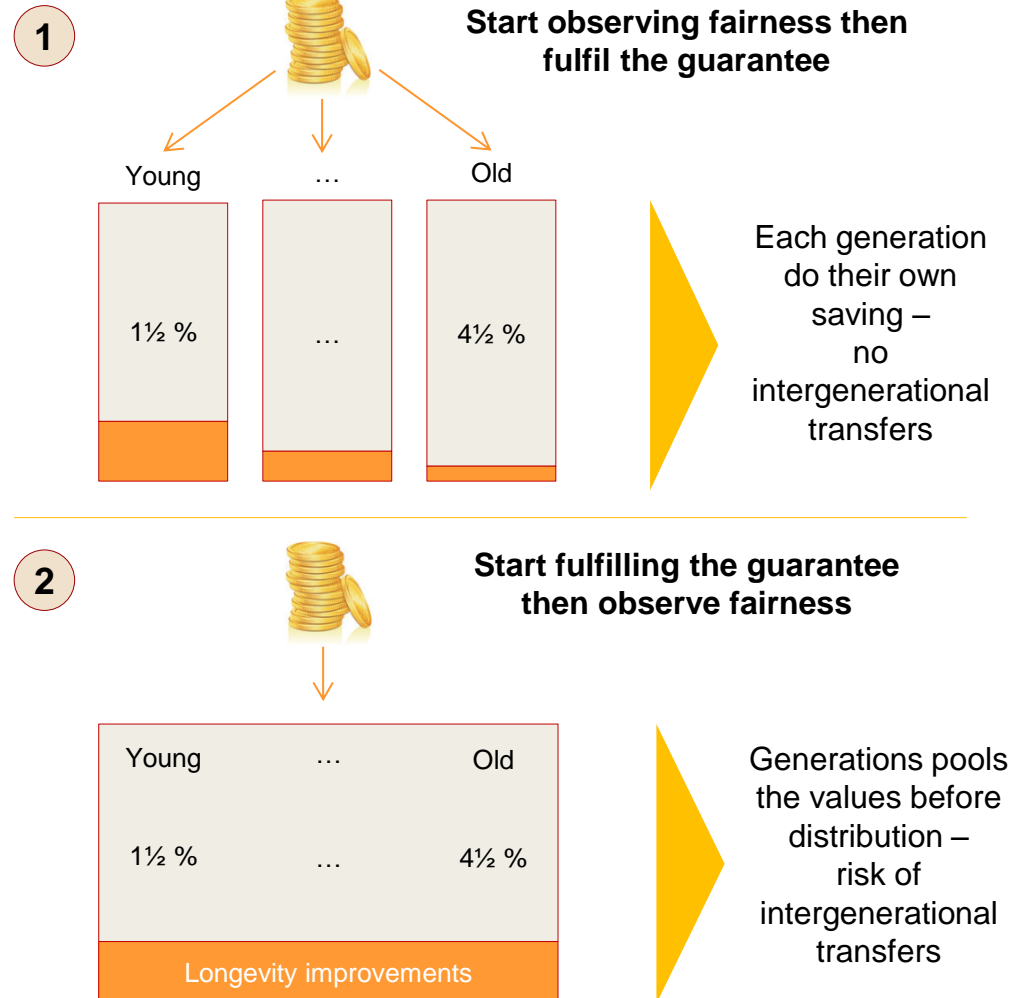
- Divide the contract into two elements: insurance cover and savings
- General questions:
 - Social norm
 - Intergenerational transfers
 - Who is paying for the increase in longevity?
- The Danish constraint (FBA §21)

§ 21. De efter § 20, stk. 1, nr. 1-5, anmeldte forhold skal være betryggende og rimelige over for den enkelte forsikringstager og andre berettigede efter forsikringsaftalerne.

Stk. 2. De anmeldte regler for beregning og fordeling af realiseret resultat, jf. § 20, stk. 1, nr. 3, skal være præcise og klare og skal føre til en rimelig fordeling.

Stk. 3. Præmierne for nytegnede forsikringer skal være tilstrækkelige til, at forsikringsselskabet kan opfylde alle sine forpligtelser, således at der ikke vil være behov for systema-

... it has to lead to a fair distribution



Different solutions in EU, in DK fairness is the strongest

THANK YOU
