Using term-dependent assumptions for pension scheme valuations
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Yield Curve Valuations
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Yield curve valuations

- Introduction
- What difference does it make?
- Advantages and disadvantages for clients
- Practical issues for actuaries
- Different types of valuation (Solvency, Accounting, etc.)
- Conclusions and discussion

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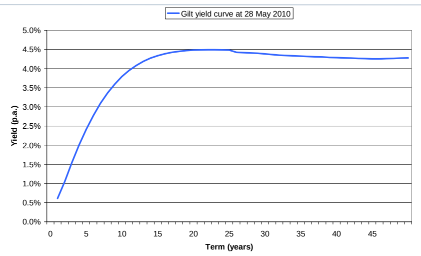
Introduction – Defining a yield curve valuation



Source: Gilt spot yields, using Hewitt derived data

… where financial assumptions are term-dependent

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Introduction – Becoming more mainstream

- In 2008, 5% of Hewitt Trustee clients carried out a yield curve valuation
- In 2009, 20% of Hewitt Trustee clients carried out a yield curve valuation

Tipping point ahead?

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Introduction – Drivers for change

- More sophisticated investment strategies
- Maturing schemes with ‘Flightpath’, ‘Journey Plan’, ‘Road-map’, ‘Glide to buy-out’, ‘Rocket route’, ‘Decommissioning plan’
- More sophistication in other actuarial assumptions e.g. longevity

Generally practical motivation rather than ideological

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Analysis - how much difference does it make?

For three typical schemes

- Immature
- Average
- Mature

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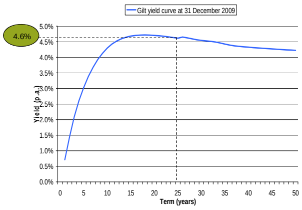
Three approaches



Source: Gilt spot yields, using Hewitt derived data at 31 December 2009

- **Updated duration** - at each date, use spot yield at the 'duration' of the liabilities
- **Fixed duration** - as above, but freeze duration on day 1
- **Index yields** - use long dated FTSE-Actuaries gilt indices

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Analysis - how much difference does it make?

- Q1: How close are these simplifications to a full term dependent approach?
- Q2: How do the differences change over time?

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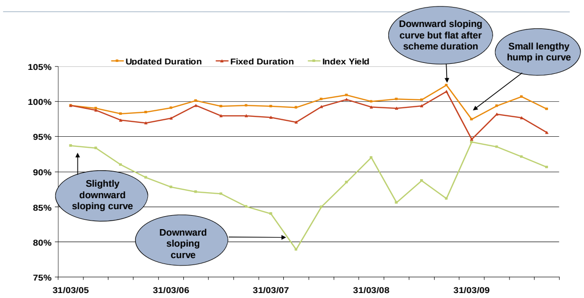
Results for "immature" scheme



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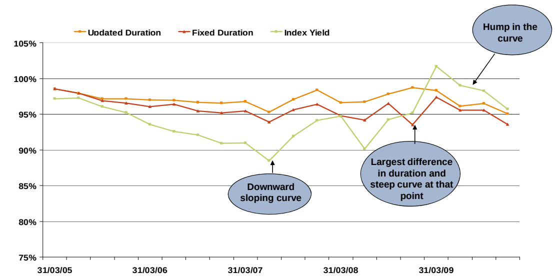
Results for “average” scheme



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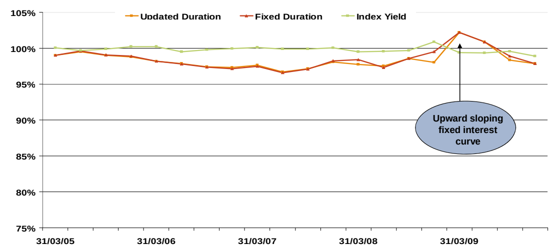
Results for “mature” scheme



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Supporting analysis, using simulations

- Quick and simple analysis to try to test whether sensible scenarios would lead to overstated liabilities
- Again looked a mix of immature, average and mature schemes
- Using theoretical but plausible curves
  - Downward sloping
  - Upward sloping
  - With and without humps
- About 2,500 simulations

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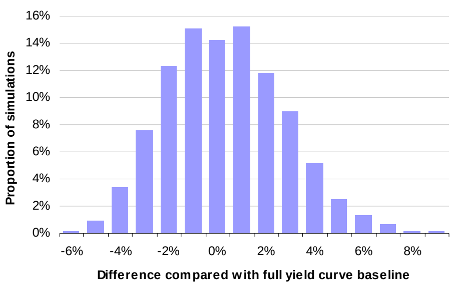
Supporting analysis, using simulations



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Conclusions from analysis

- **Flat rates can give very different answers to the full term dependent approach**
- **Can give either higher or lower liabilities**
  - Mainly lower for the period covered in the analysis due to shape of yield curve
  - But theoretical analysis shows could easily be higher for plausible yield curves
- **Using spot rate at duration of the liabilities has underestimated by up to around 5% for an “average” scheme over the last 5 years**
- **Impact depends on maturity and is not “predictable”**

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Advantages for clients

Advantages
Minimise ‘reporting errors’ with LDI
More theoretically correct starting point
Additional ‘accuracy’ for decisions
Impact on value placed on liabilities

Credibility of claimed advantages is very case specific

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Disadvantages for clients

Disadvantages
Increase in costs
Spurious accuracy
Ease of communications
Impact on value placed on liabilities

Is cost the only 'real' disadvantage?

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Practical issues for actuaries

1. 'Risk free' reference
   - Which yield curve?
   - LPI(x,y)
2. Operational aspects
   - Valuation systems
   - Monitoring tools
   - Quality control
3. Valuation advice
   - Pre and post retirement revisited
   - Sophistication of other assumptions
   - Reg (4)(d)!
   - 'Future proofing'
4. Other advice
   - Impact on factors
   - CETVs

A lot to think about for an innocuous 'evolutionary' change…

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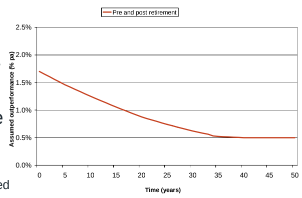
Pre and post retirement approach revisited

- Tried and tested
- Reasonable proxy for other approaches
- Less popular for yield curve valuations, and worth revisiting:
  - Cashflows on same date are discounted at different rates
  - Consider interaction with investment strategy



Graph shows the **estimated** year-on-year outperformance required over gilts for a sample scheme, where an addition of 2% (0.5%) pa is made before (during) retirement

Will a new 'standard' emerge?

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Types of valuation

Valuation Type	Flat	Term Dependent
Technical Provisions	✓	✓
Self Sufficiency	X	✓
GN9 Solvency	✓	✓
Buy Out	X	✓
PPF	✓	X
Accounting	✓	✓

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Conclusions – Our View

- Flat rate approximations can be "significantly" different to a full YC valuation
- Advantages outweigh the disadvantages but cost has been the key barrier. However the cost of carrying out a YC valuation are coming down rapidly.
- The actuarial profession could be lagging behind other financial institutions
- **Once costs are the same "Why wouldn't you carry out a YC valuation…….the natural evolution of the actuarial valuation"**


Book value with Long term assns


Actuarial value with Long term assns


Smoothed Market value


Market value with Market related flat assns


Market value with Market related YC assns

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