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# LDI nine years on

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# History

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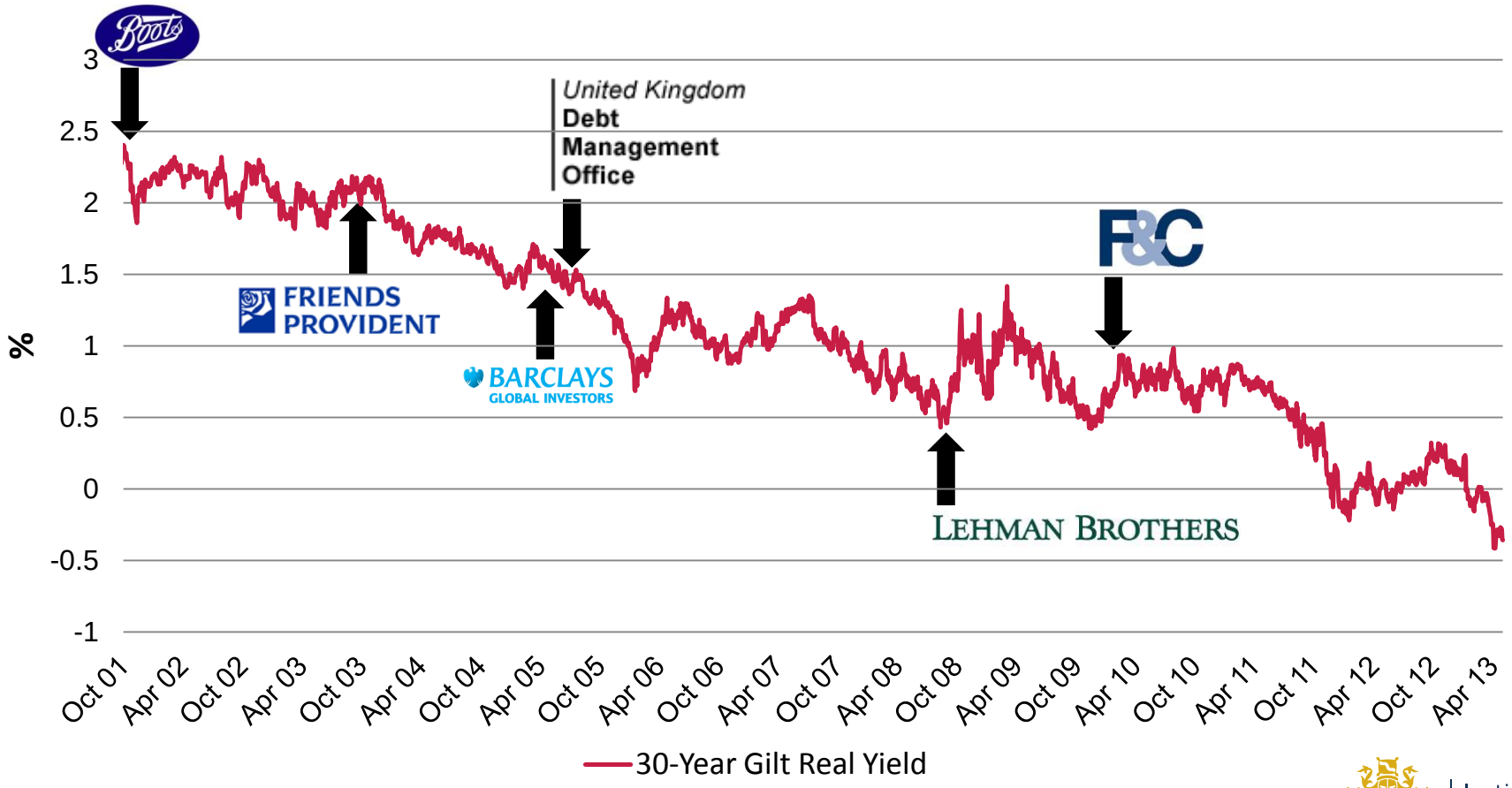
# History

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# The Evolution of LDI

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# Evolution of LDI

**LDI 1.0**

Liability Immunisation

- Interest rate swaps
- Nominal gilts
- Inflation swaps
- Index-linked gilts

**LDI 2.0**

The LDI “Manager”

- Gilt repo and TRS
- Swaptions
- Unfunded asset exposures
- Corporate linkers

**LDI 3.0**

Holistic ALM

- Sophisticated option overlays
- Flight Plan Consistent Assets

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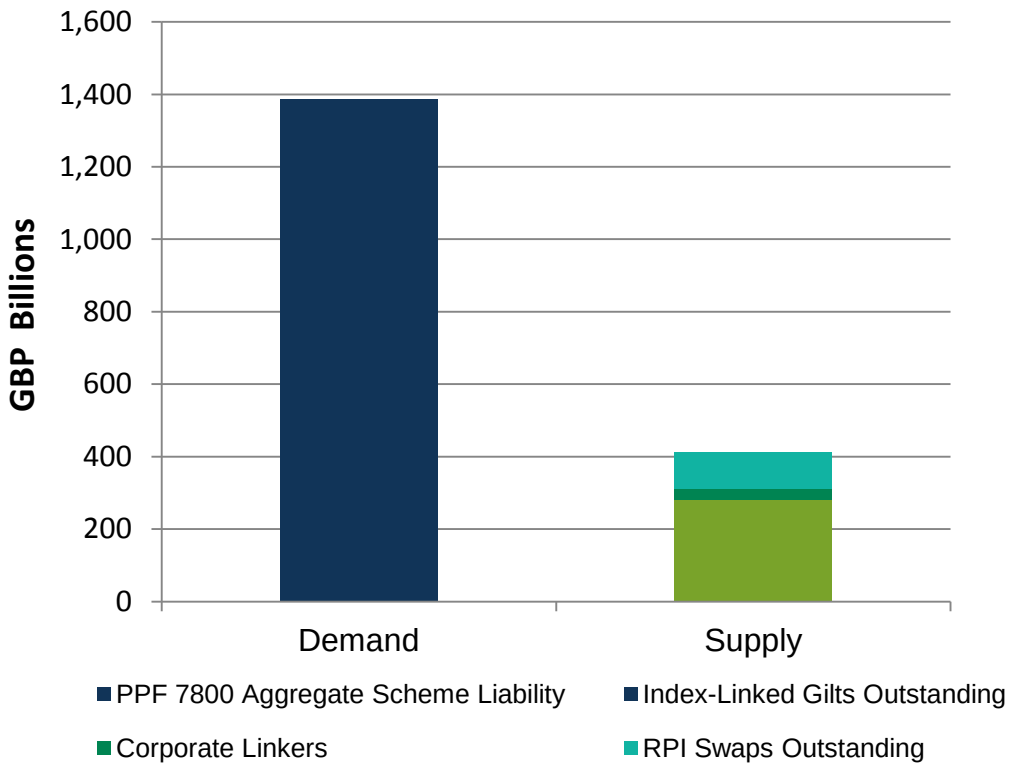
# Market for Gilt-Based Hedging




Source: Barclays, Pension Protection Fund, Redington

Potential demand for long-dated linkers outweighs available stock of RPI-linked assets and RPI swap market capacity

- The Pension Protection Fund 7800 Index of DB schemes estimated aggregate liability of £1,385.1bn at end of March 2013
- £280bn (inflation-uplifted notional) of index-linked gilts outstanding
- £32bn of corporate linkers by market value (as measured by Barclays GBP non-govt inflation linked index)
- £100bn* of RPI Swaps outstanding

*Rough estimate from Barclays, based on general consensus

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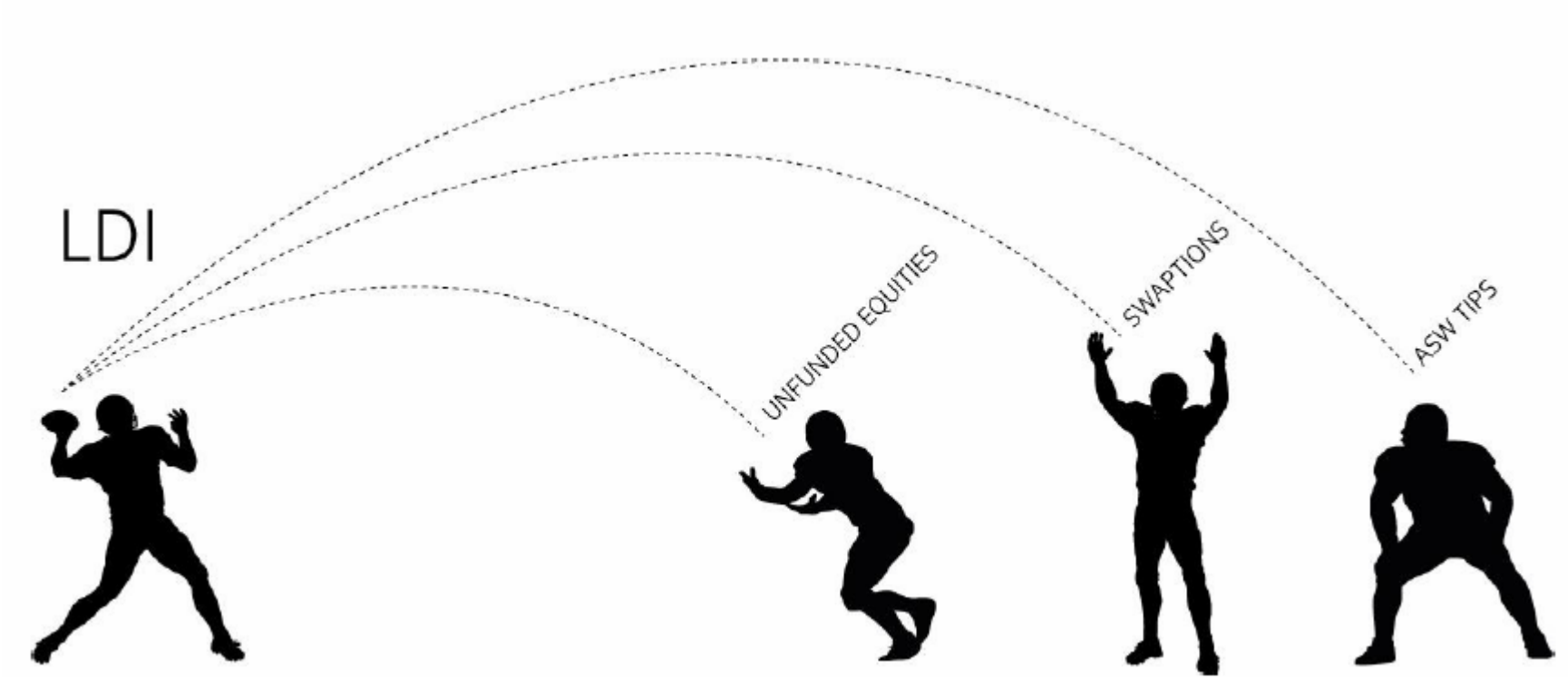
# LDI 2.0

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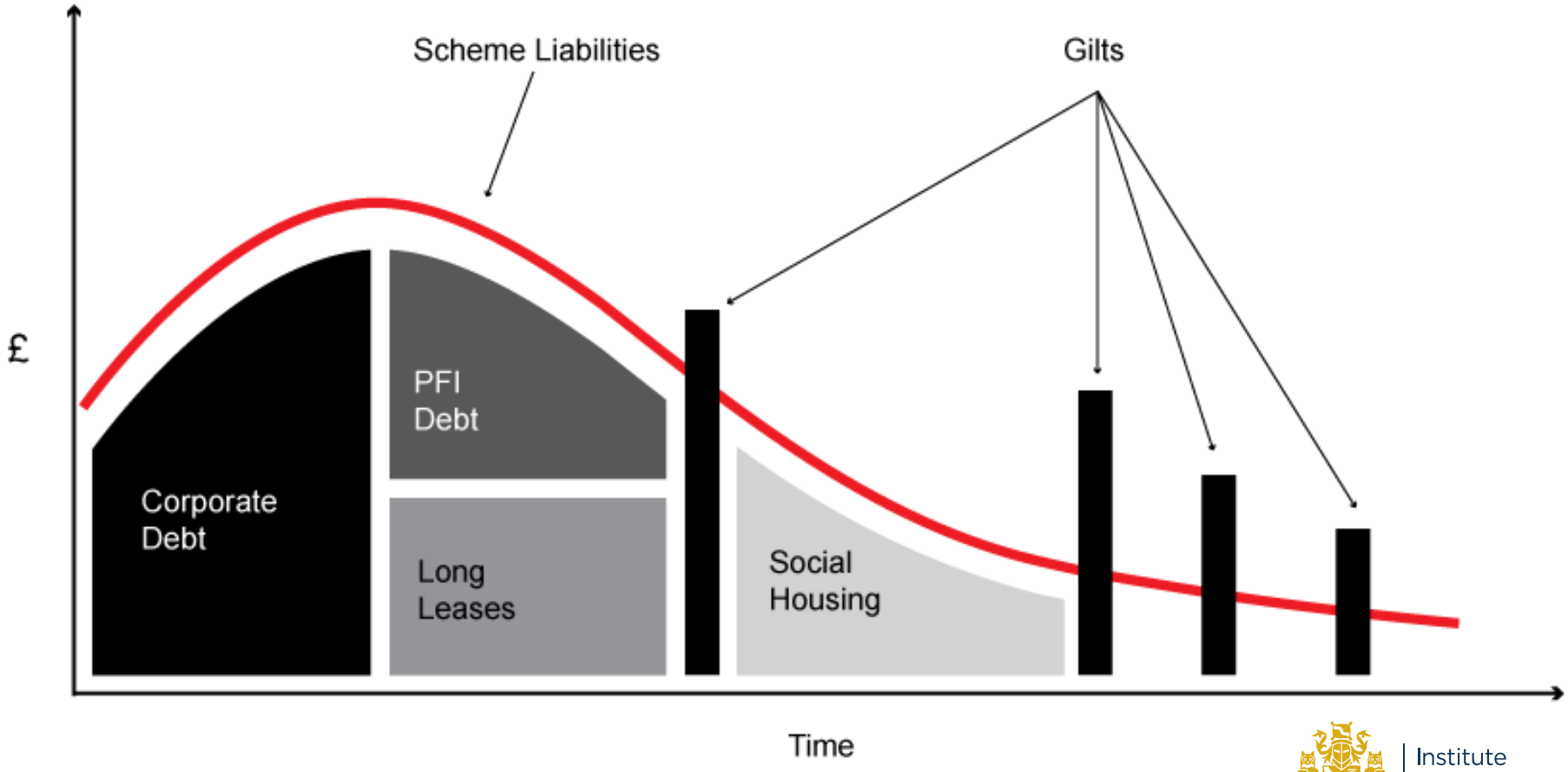
# Growing Asset Class Toolkit

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# Pension Risk Management

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# Pension Risk Management Framework

| Objective | Measurement (Assumed) | Performance Indicators | Performance (May 12) | RAG |
|---|---|---|---|---|
| **Funding Objective** | To reach full funding on the Technical Provisions discount basis by [2023] | **Expected Returns** (ER) **> Required Returns** (RR) | RR: **Gilts + xxxbps**<br>ER: **Gilts + 73bps**<br>Difference: **xxxbps** | ○ |
| **Investment Strategy** | Actual Returns should exceed Expected Returns (implying outperformance) | **Actual Returns** (AR) **> Expected Returns** (ER) | AR: **Gilts + xxxbps**<br>ER: **Gilts + 73bps**<br>Difference: **Xxxbps** | ○ |
| **Risk Budget** | The investment strategy should not risk the deficit worsening by [20%] of liabilities over a 1-year period | **VaR95 < 20% of liabilities** | VaR95: **[xx]%** | ○ |
| **Hedging Strategy** | Nominal/Inflation hedge ratio should be maintained within +/- 5% of the funding ratio. | **Funding Ratio** (Technical Provisions basis) | **84%** | ○ |
| | | **Nominal Hedge Ratio** (TP basis) | **xx%** | ○ |
| | | **Inflation Hedge Ratio** (TP basis) | **xx%** | ○ |
| **Collateral** | Maintain sufficient eligible for the purposes of covering margin calls that may arise from the Scheme's current derivative positions over a 1 year period. | **Total available eligible collateral** | **>£[100]m** | ● |
| | | **Potential collateral call after VaR95 event** | **<£[100]m** | |

**RAG Status** ● *Metric is at or above target* ● *Metric is within [10%] of target* ● *Metric is more than [10%] away*

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# To hedge or not to hedge...

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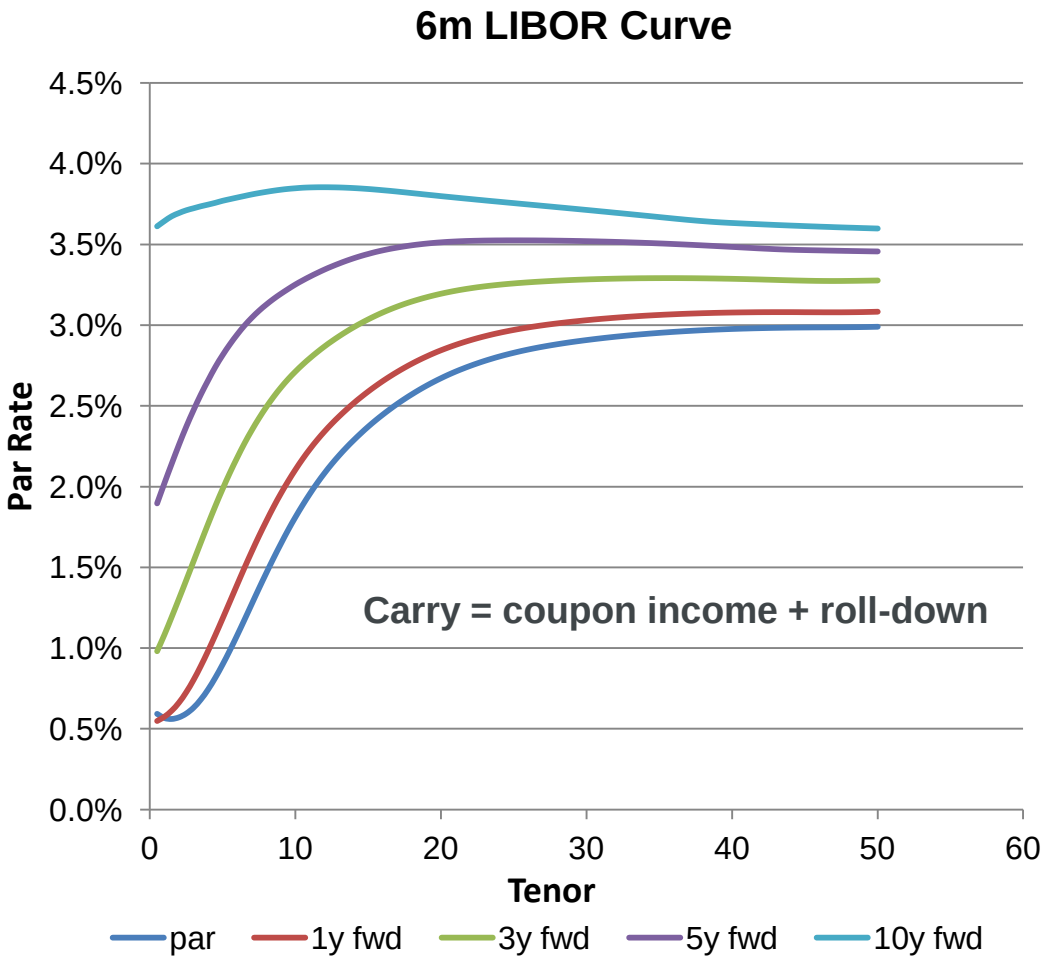
# Roll-Down and Carry




- Carry occurs as a result of the market pricing in rising short-term rates. It is easiest to explain in the context of a receiver par swap (say 20 years)

- In the first year, the fixed leg is larger than the floating leg- this is **coupon income**

- If rates follow the forward curve, then the remainder of the swap will have negative PV, to balance the coupon income

- However, if rates do not rise as priced in, the remainder of the swap will have positive PV, as it will be a 19y swap paying the 20y rate; this is **roll-down**

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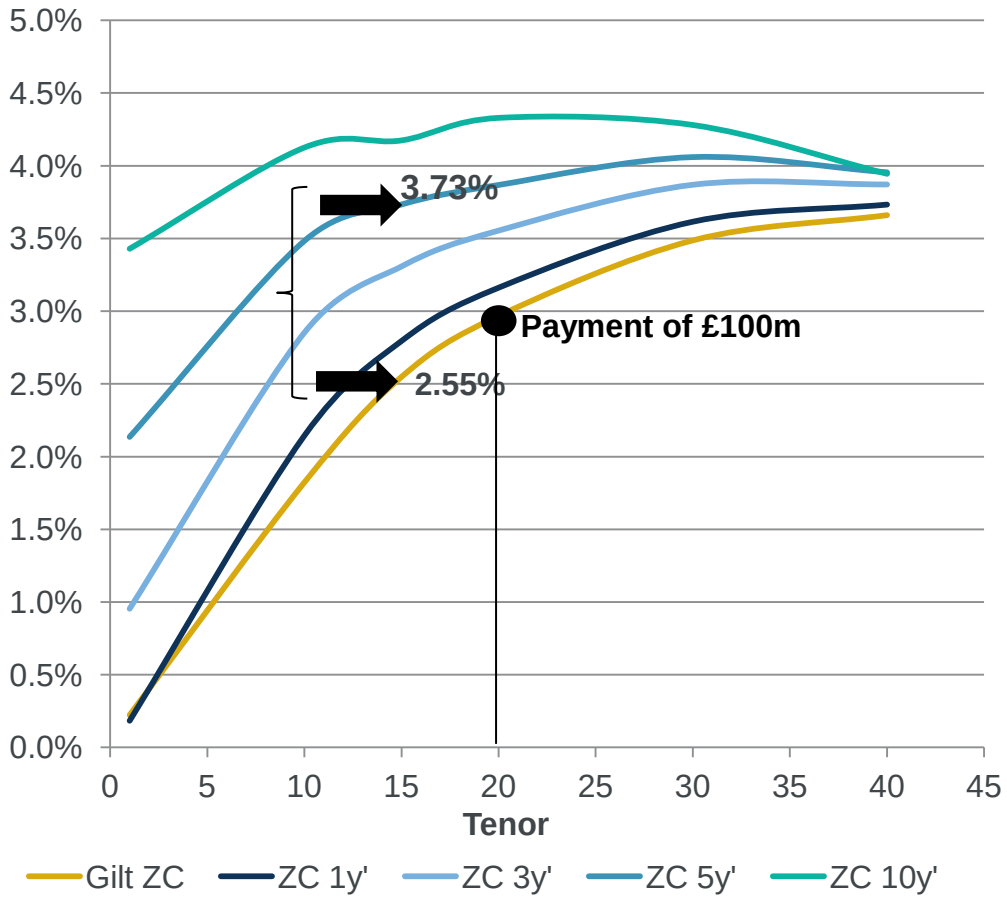
# Roll-Down and Carry




- Imagine a payment of £100m in 20 years' time
- The PV of this cashflow is **£56m**
- In five years' time, the PV is projected to be £**58m**
- However, if rates don't change the PV is projected to be **£69m**
- This means if rates don't rise as is priced into the forward rates, the value of the cashflow will grow by **3.51%pa**

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# Case Study

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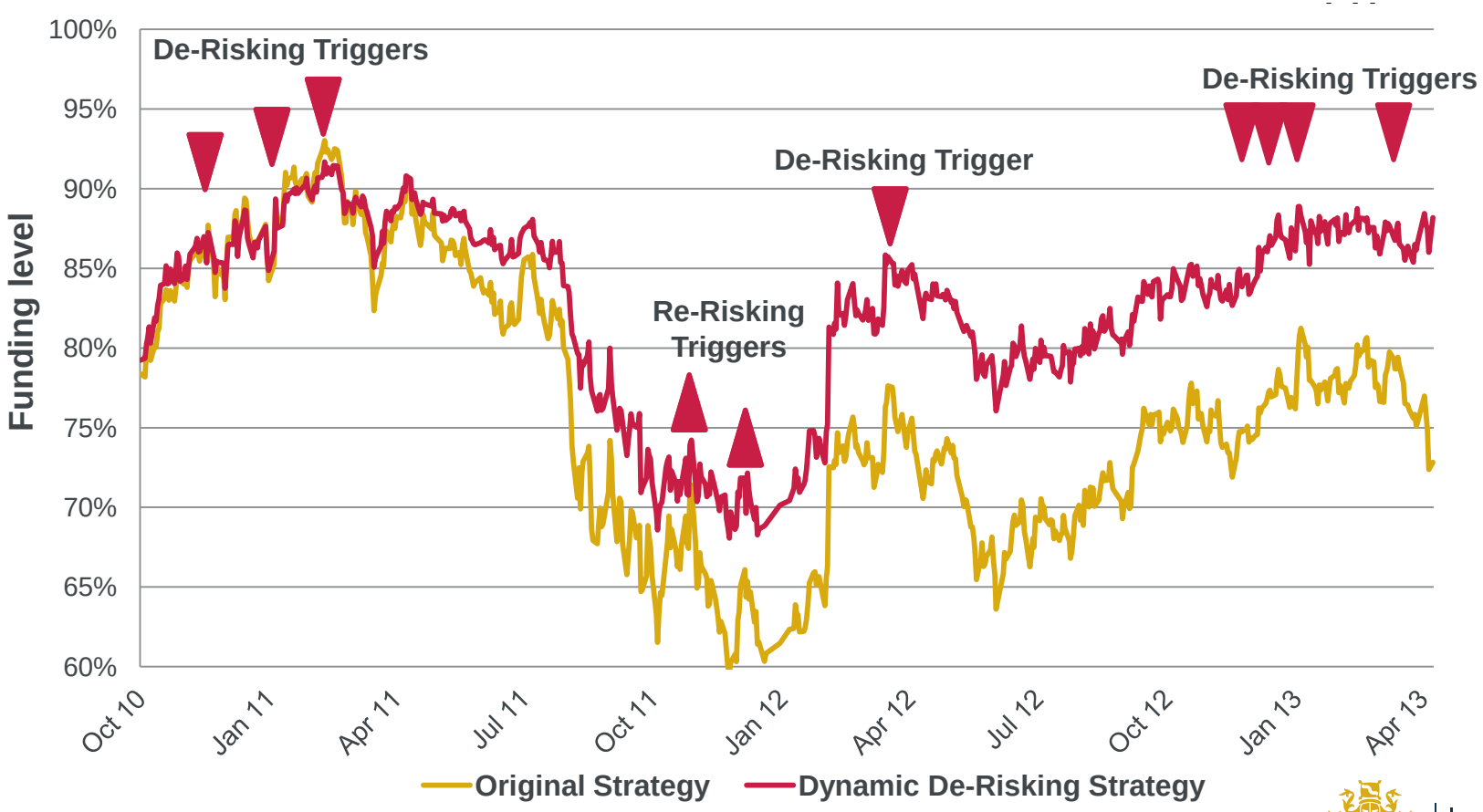
# Not just a real yields view...

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# Roll-Down and Carry Exercise

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