

Hedging the risk-free rate under Solvency II

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Say hello to our working party

Remit

- Why hedge the risk-free rate?
- How you hedge rates exposure in Solvency II world
- Focus on best estimate liabilities
- Practical considerations

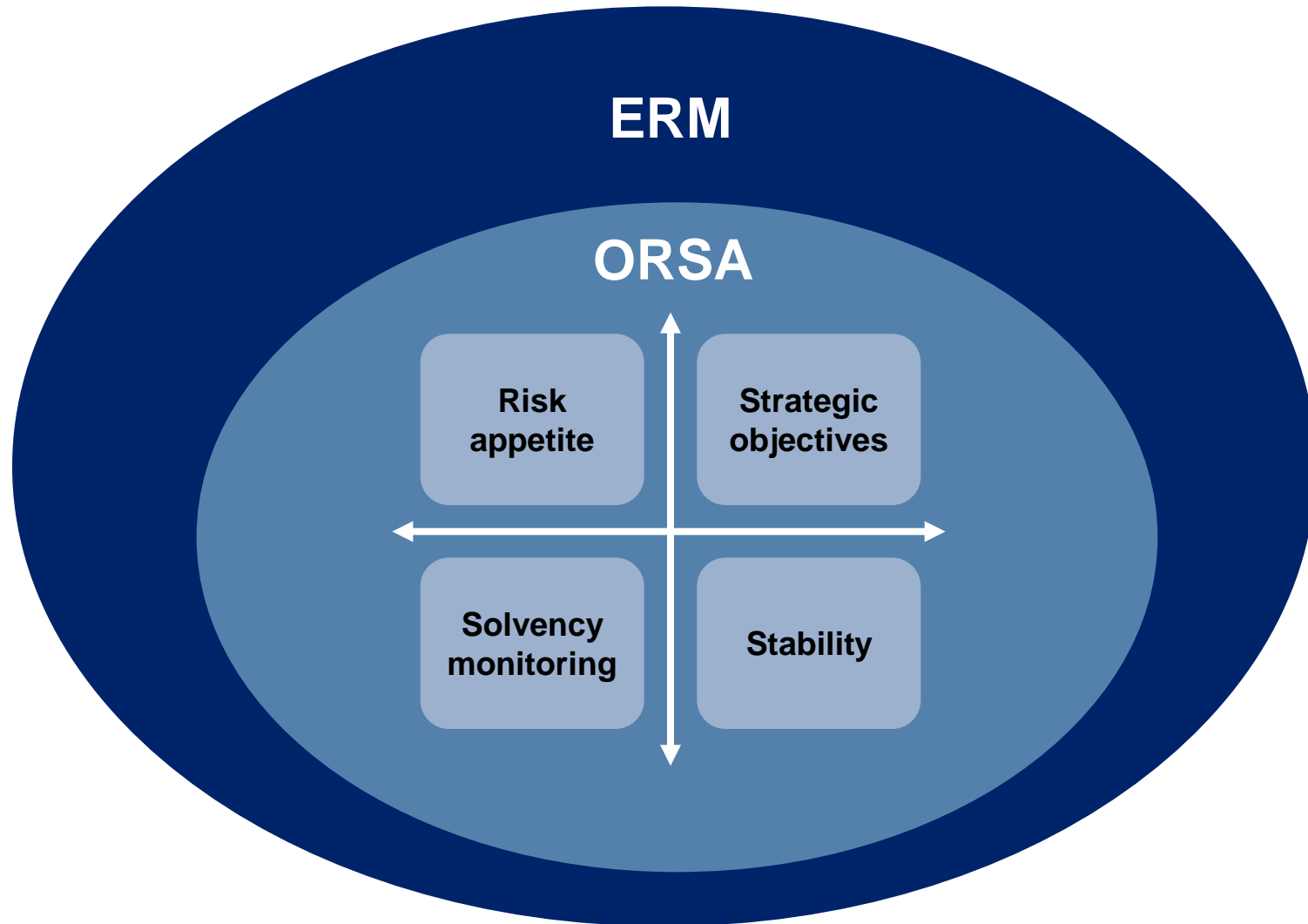
Working party members

- | | | |
|-----------------|-----------------|----------------|
| • Alex Probyn | • Derek McLean | • Oliver Firth |
| • Angelina Lai | • Eamonn Phelan | • Paul Collins |
| • David Johnson | • Emily Penn | • Ross Evans |

The views expressed in this presentation are the collective views of the working party
They do not reflect the view of any individual member, nor their employer, nor the Actuarial Profession

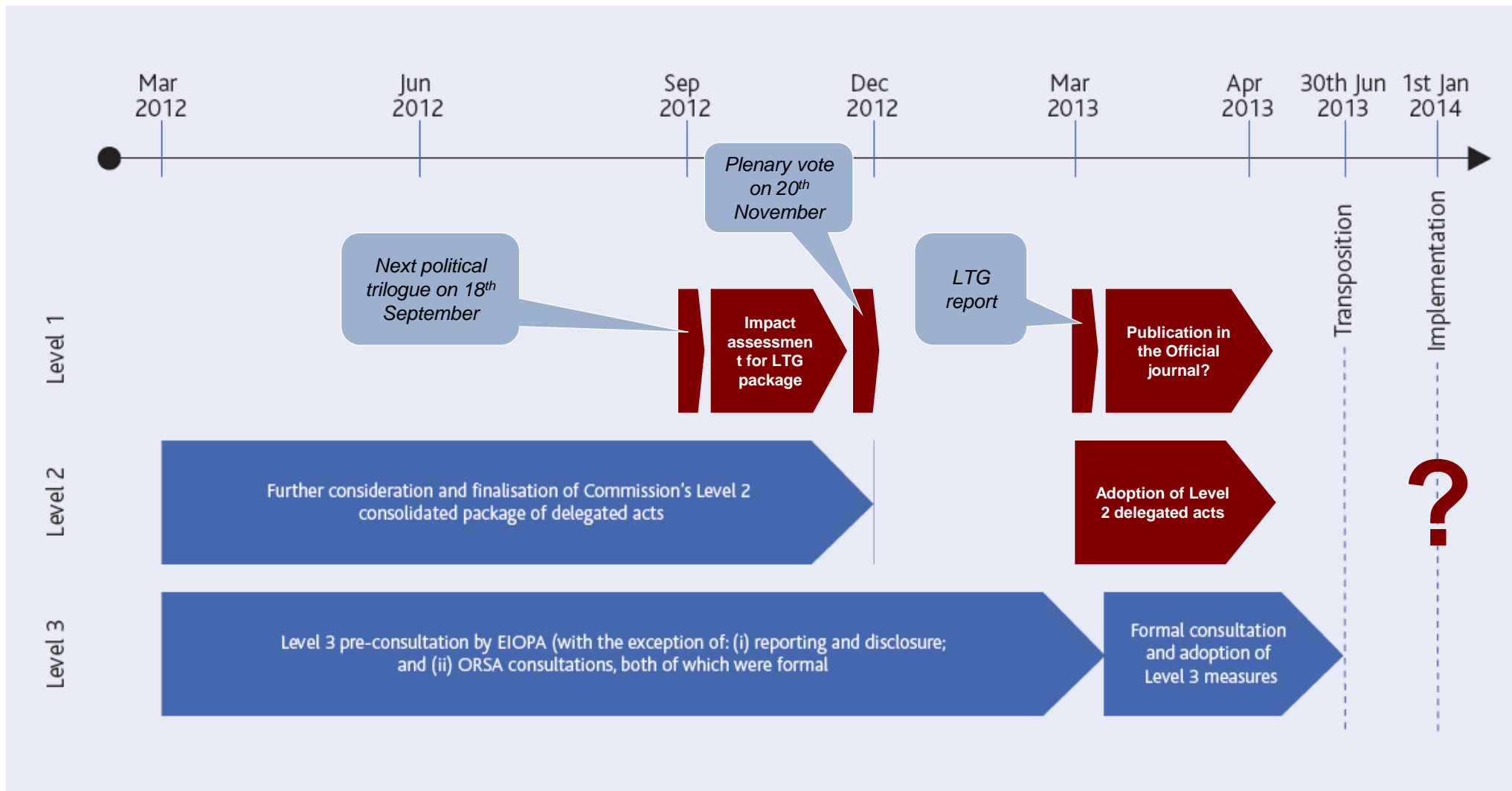
Why hedge?

Why hedge the risk-free rate in the first place?



Long-term guarantees package

Time is fast running out



Compromises agreed at the ECON vote in March

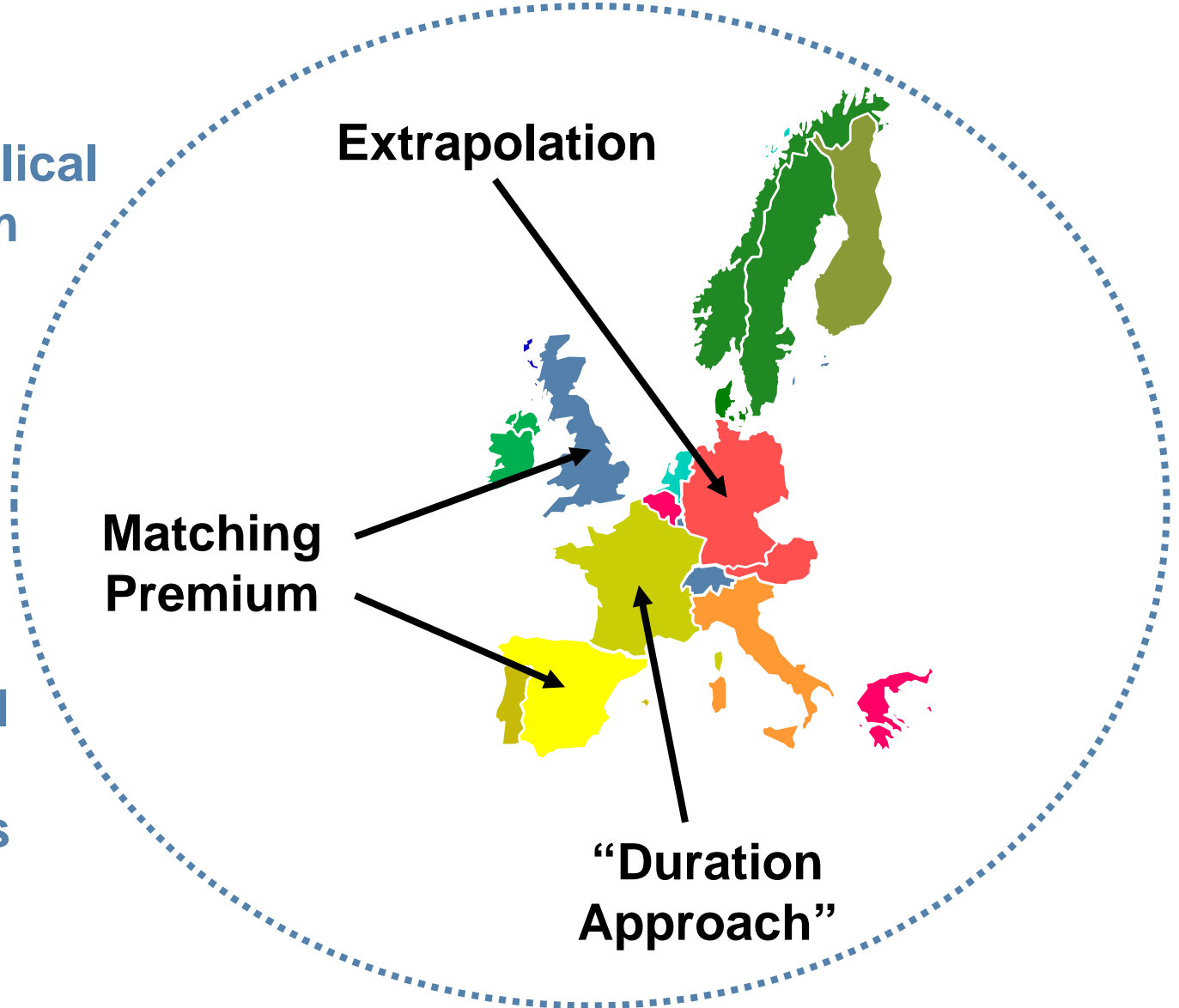
Countercyclical
Premium

Extrapolation

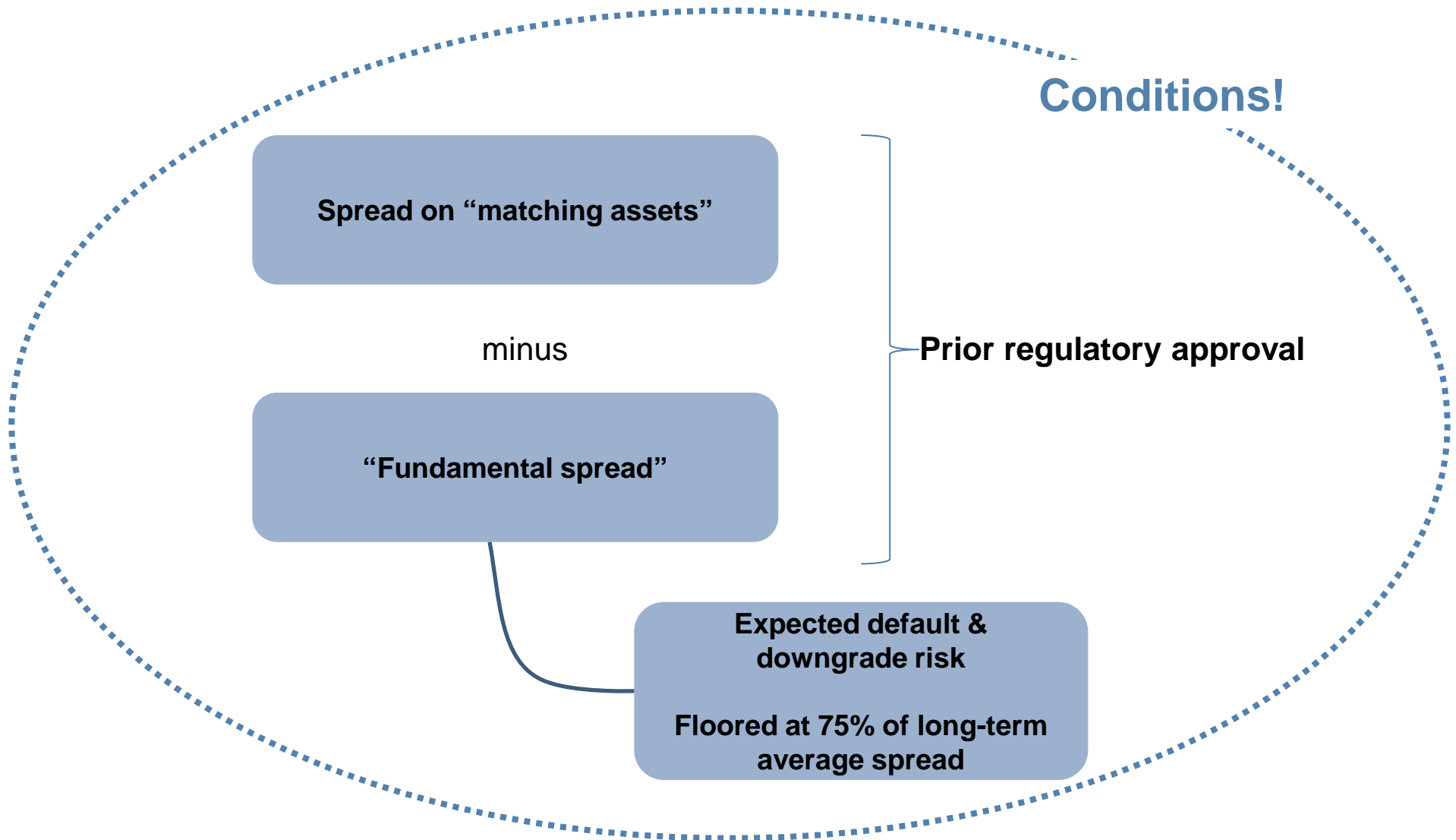
Matching
Premium

Symmetrical
Adjustment
Mechanisms

“Duration
Approach”



What is the Matching Premium?



Conditions for application of Matching Premium ("Matching Adjustment")

ASSETS

- "Bond like"
- Fixed cash flows (or inflation linked)
- Currency matched to liabilities
- Investment grade only
- Limits on BBB
- Buy-and-hold
(Prevents active trading of portfolio)
- Tight cash flow matching
- No issuer optionality
(Assets with prepayment risk unlikely to qualify for Matching Premium)

LIABILITIES

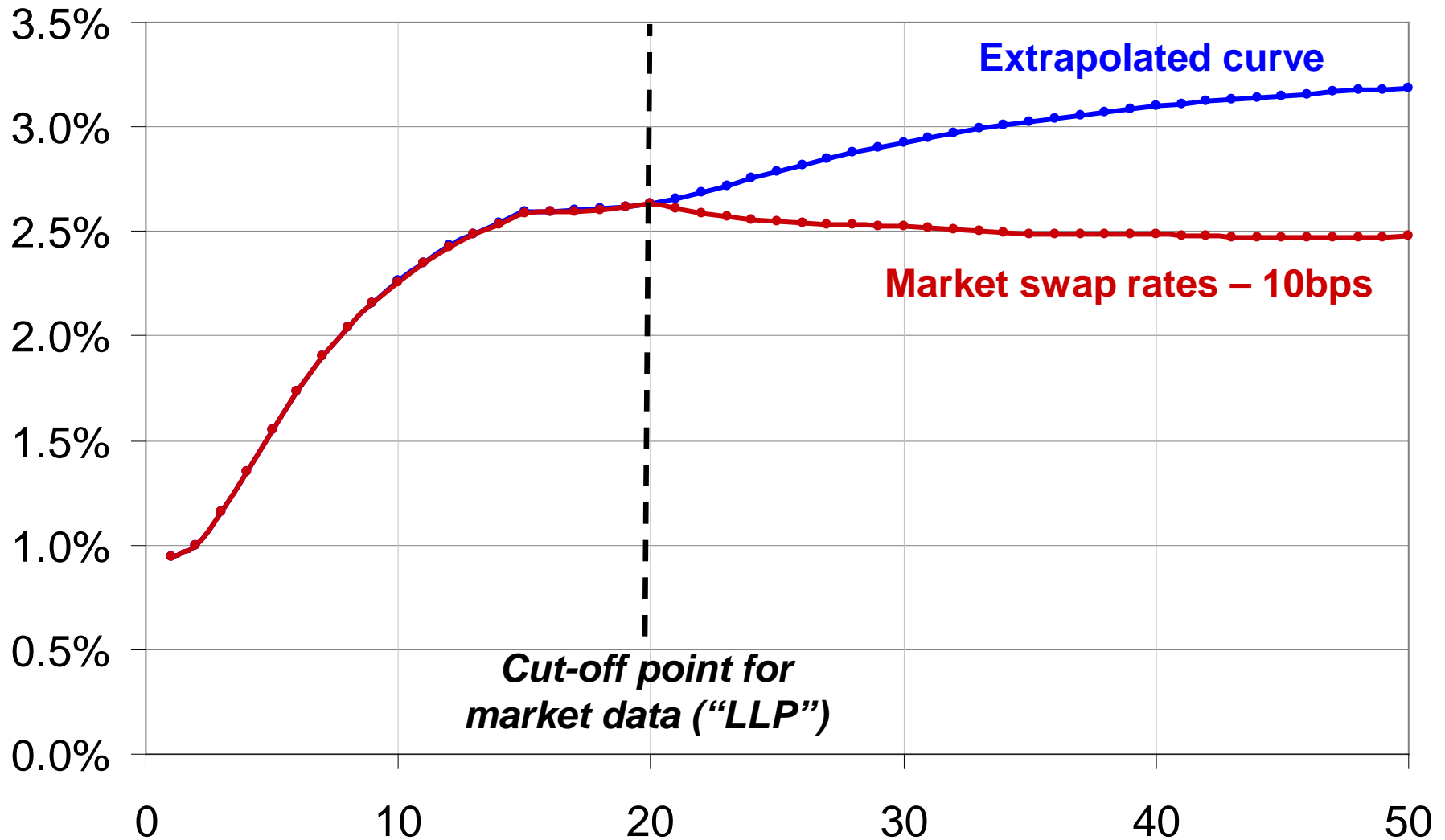
- No future premiums
- Only underwriting risks are:
Expense, Longevity & Revision risk
- No surrender option where surrender value could exceed value of underlying assets

OTHER

- Assets and liabilities must be ring-fenced without possibility of transfer
- 2 month window to restore compliance
- Restricted to insurance activities in country of authorisation

What is the risk-free rate?

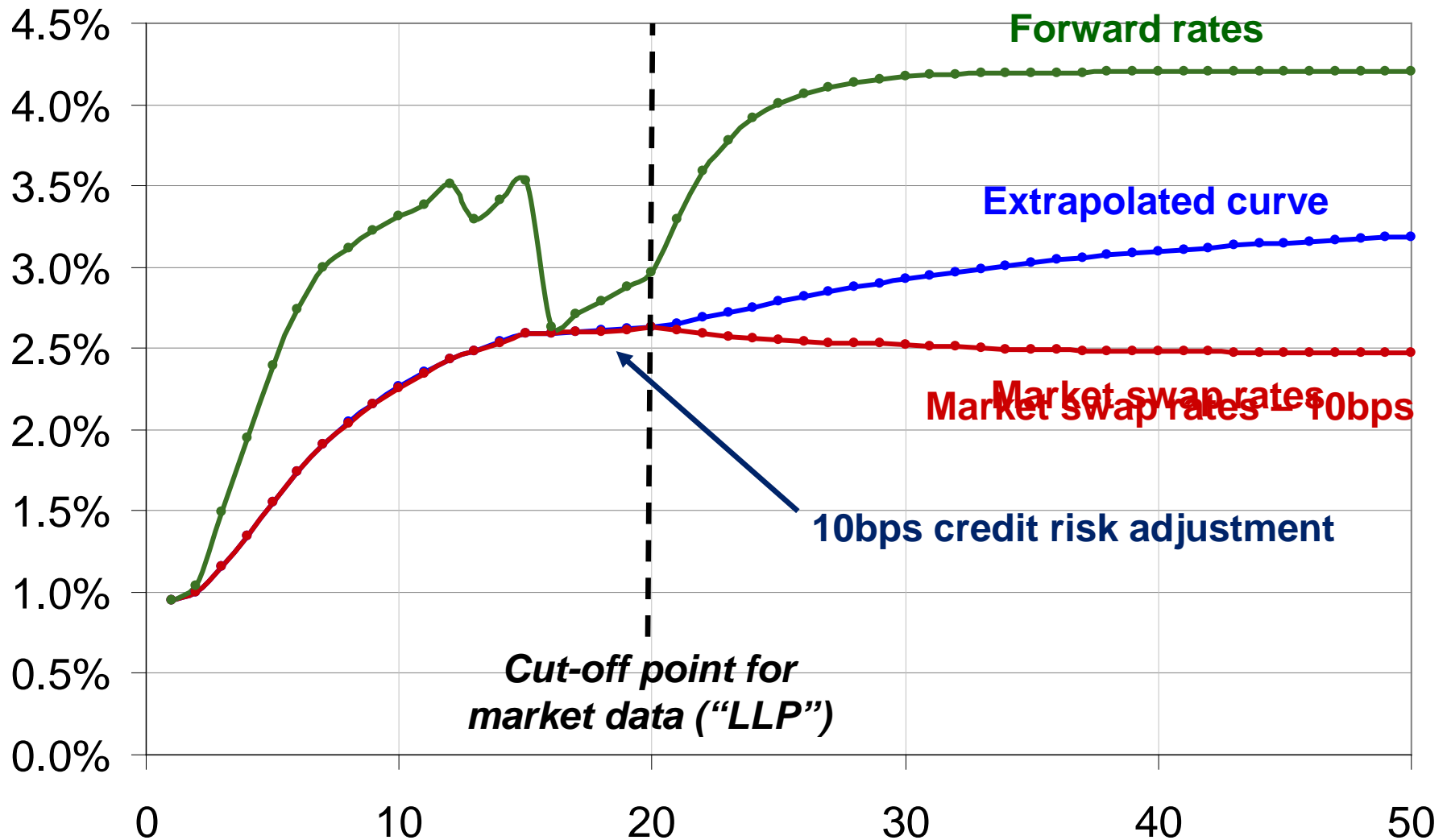
The risk-free interest rate curve under Solvency II (21 March 2012)



Extrapolation of the risk-free rate under Solvency II

- Extrapolation beyond Last Liquid Point (LLP)
 - Sterling: 50yrs (50yrs, QIS5)
 - Euro: 20yrs (30yrs, QIS5)
- “Smith-Wilson” technique
- Macroeconomic approach
 - Ultimate long-term forward rate = 4.2%
 - Convergence period: 10yrs (Parliament)
40yrs (Council & Commission)
60yrs (QIS5) } **$\alpha \geq 0.1$**

What this looks like in practice (21 March 2012)



Hedging – some practical examples

Consider two simple cases

1. Case 1: Bullet 10yr liability cashflow
2. Case 2: Bullet 50yr liability cashflow

EUR 10m in each case

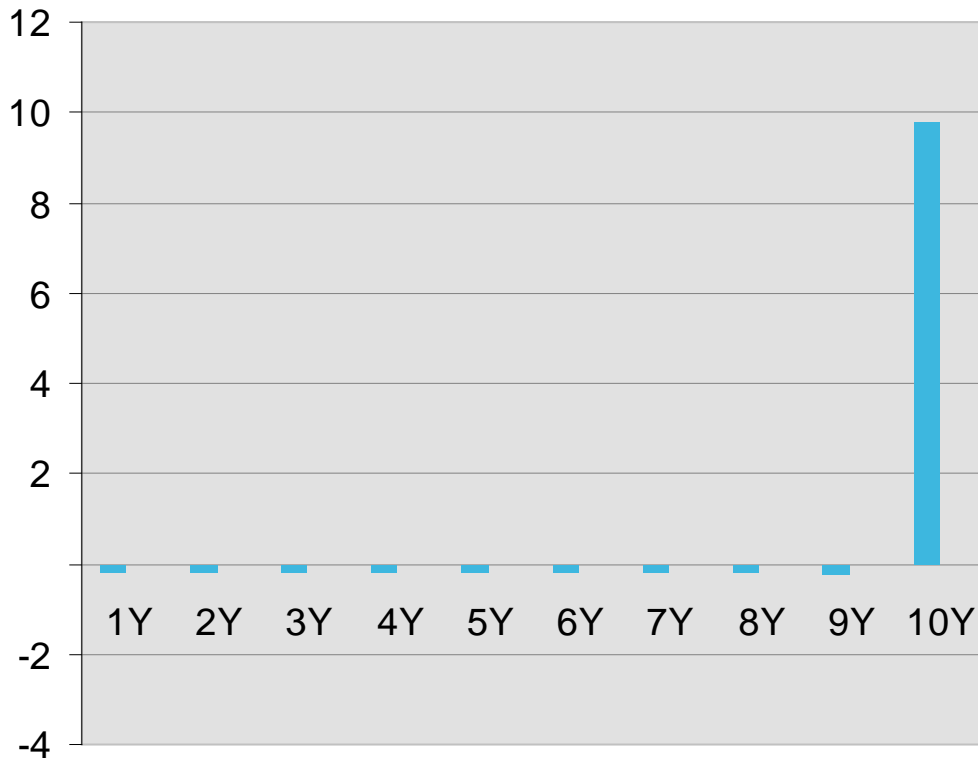
Delta hedging technique used to construct swaps hedge

21st March 2012

Market consistent / Economic hedges

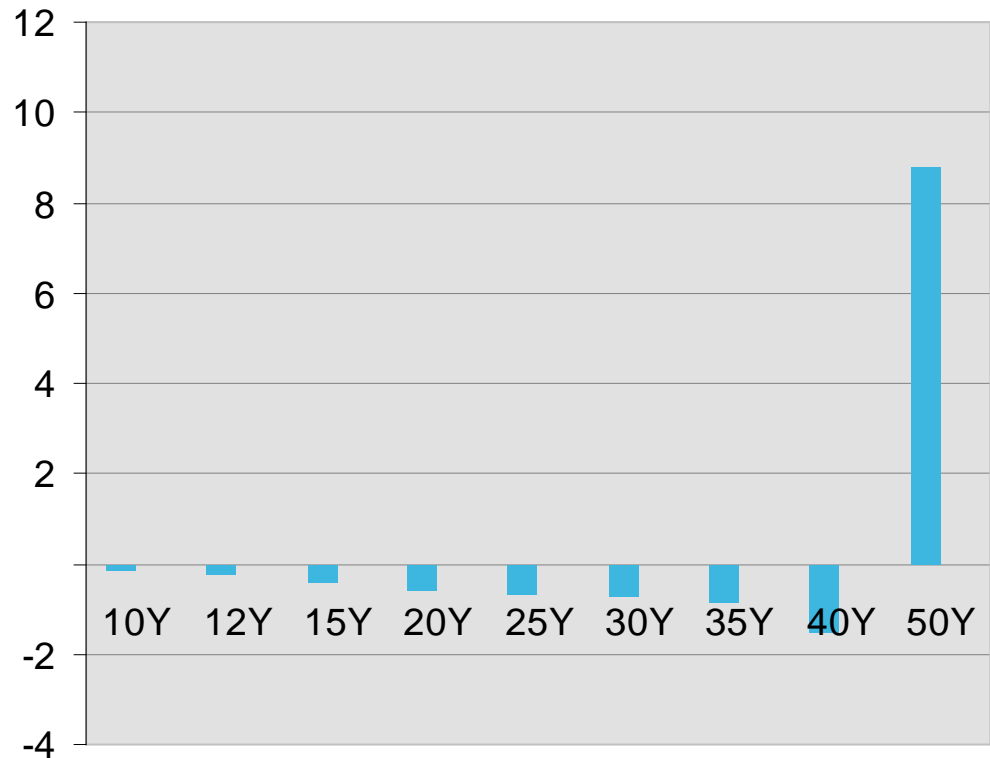
10yr bullet liability cashflow

Hedge Notional €m



50yr bullet liability cashflow

Hedge Notional €m



Remove the swaps needed to eliminate coupons

10yr bullet liability cashflow

Hedge Notional €m



50yr bullet liability cashflow

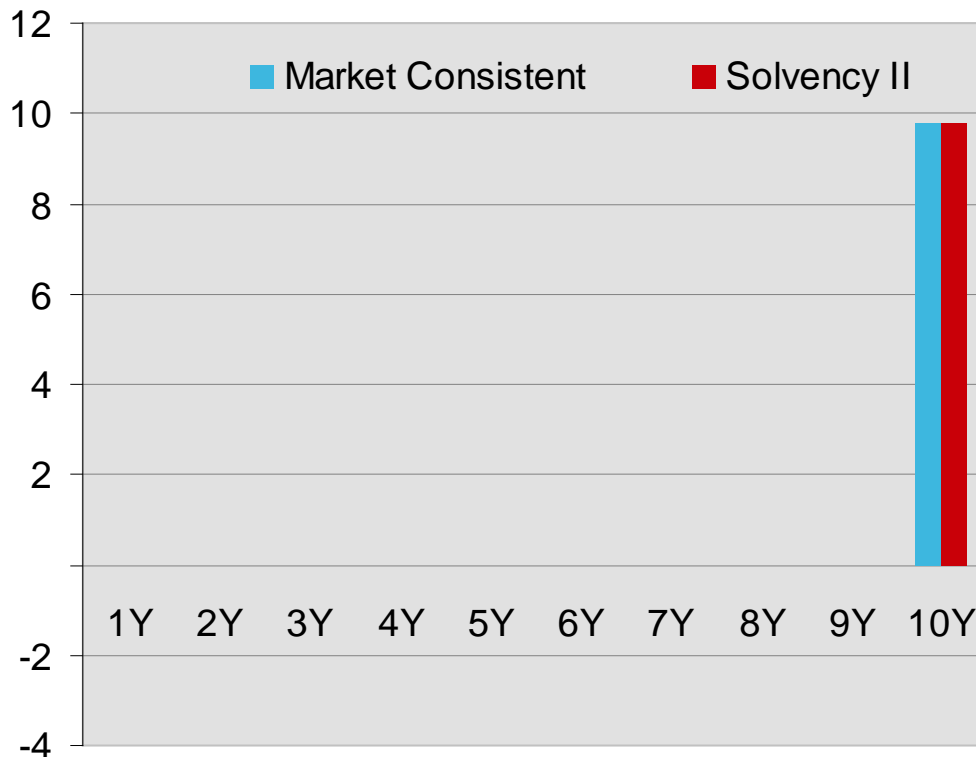
Hedge Notional €m



Economic hedge vs. Solvency II hedge (after removing swaps needed to eliminate coupons)

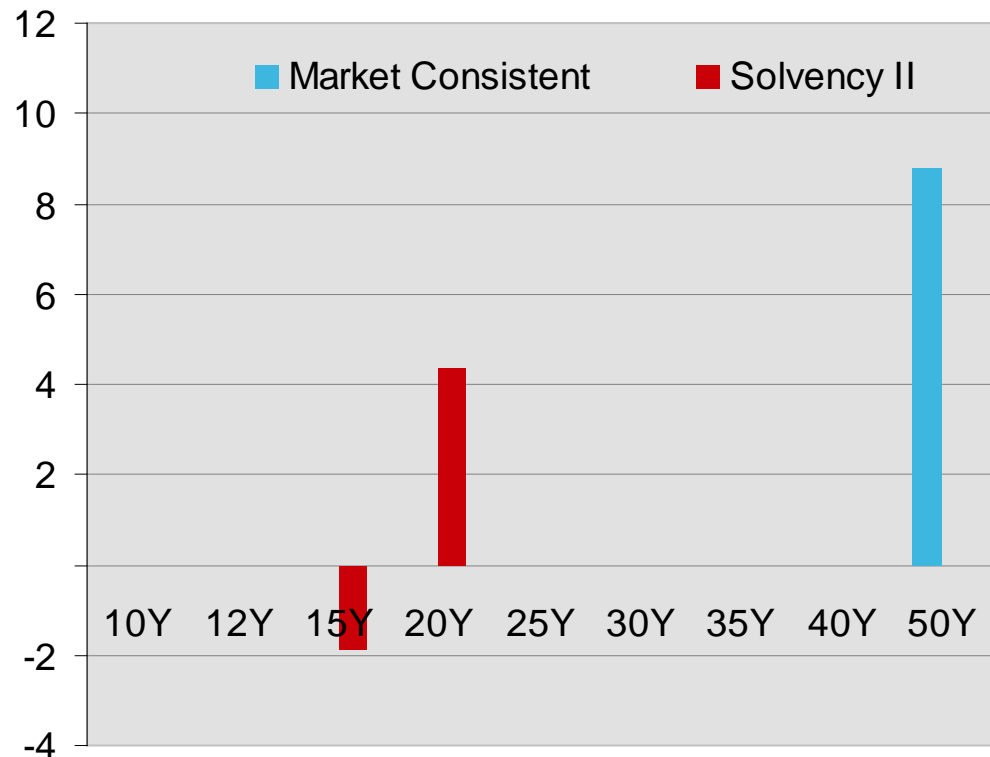
10yr bullet liability cashflow

Hedge Notional €m

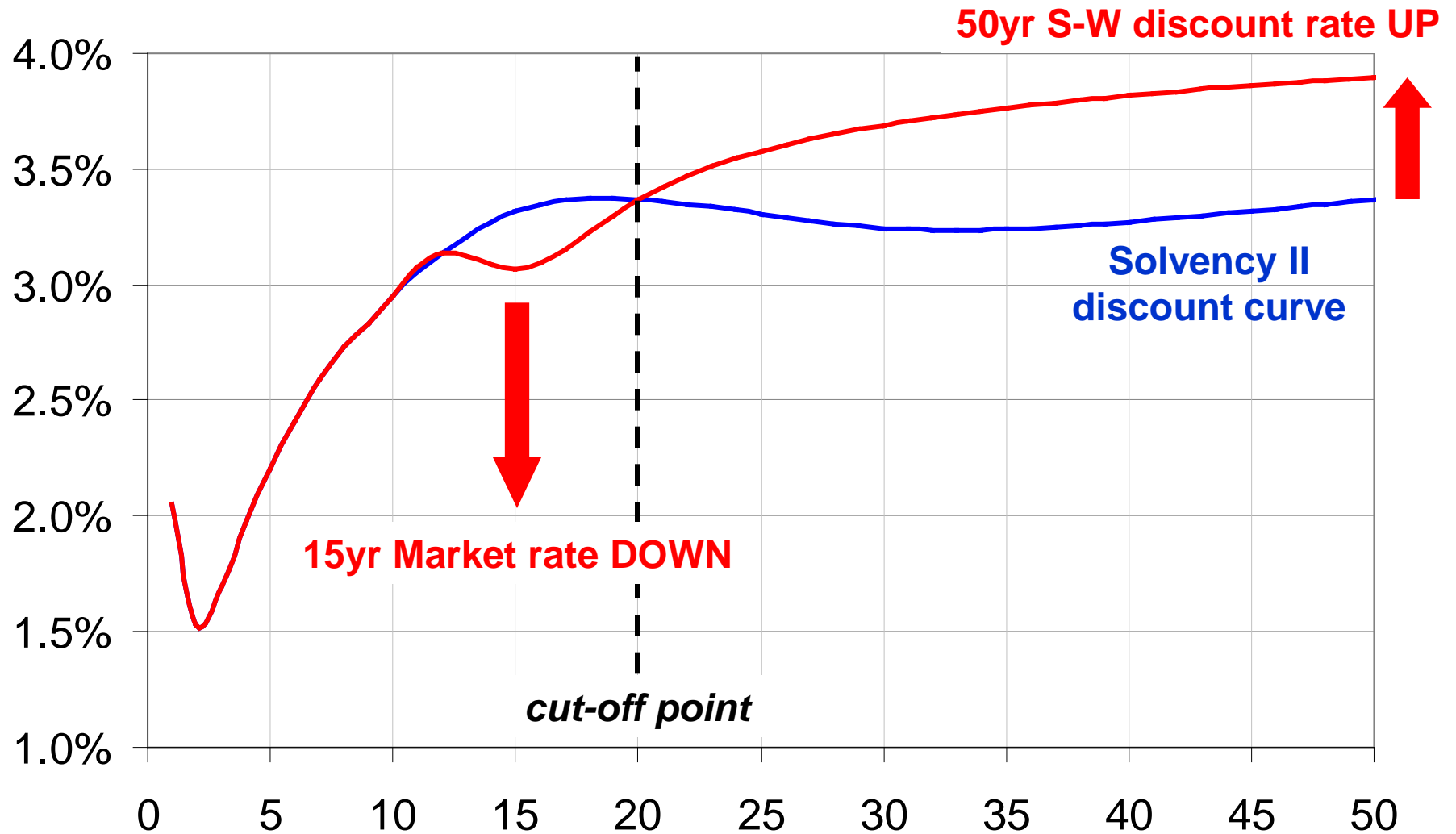


50yr bullet liability cashflow

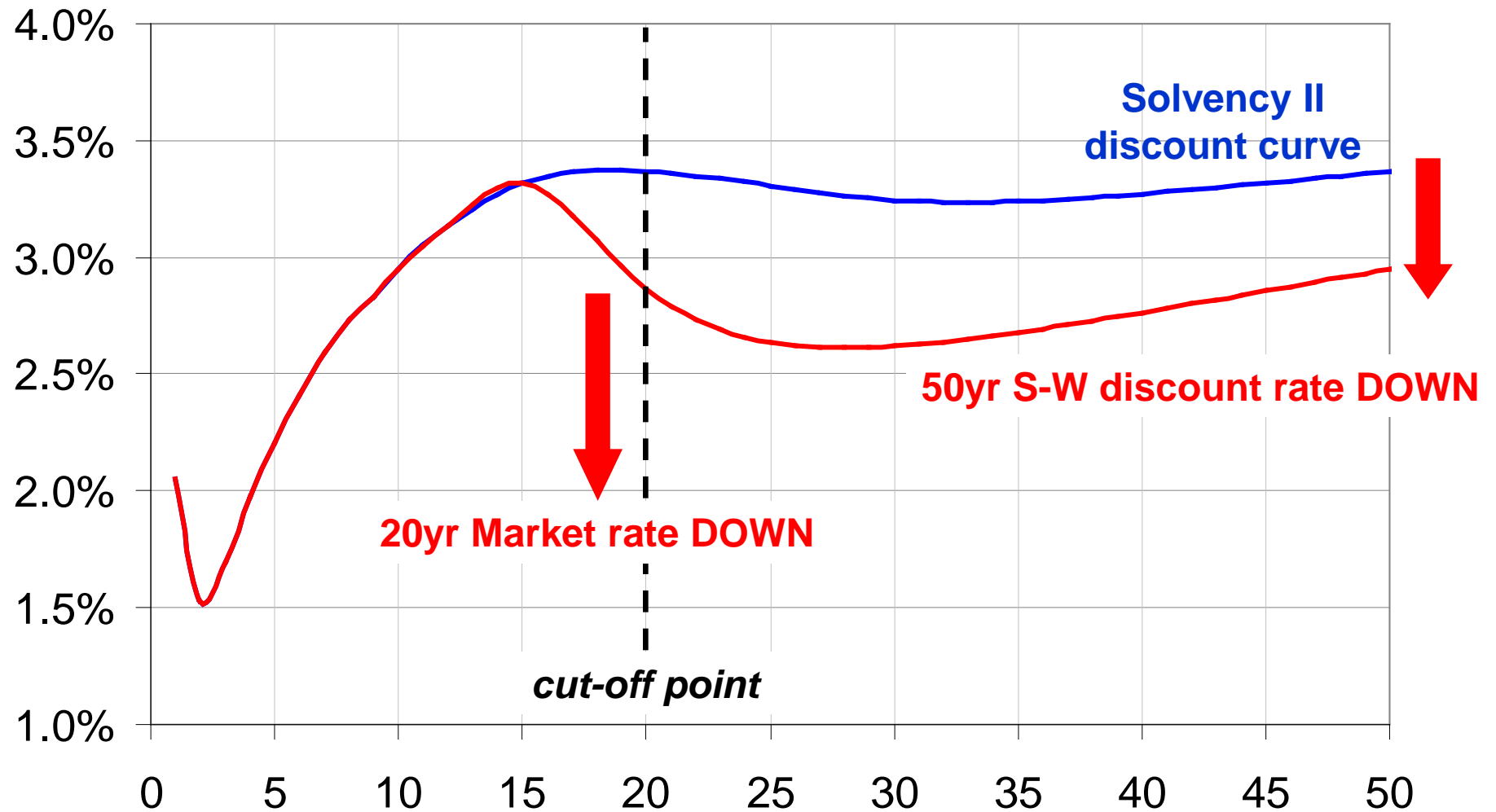
Hedge Notional €m



Slope of the market swap curve prior to the LLP



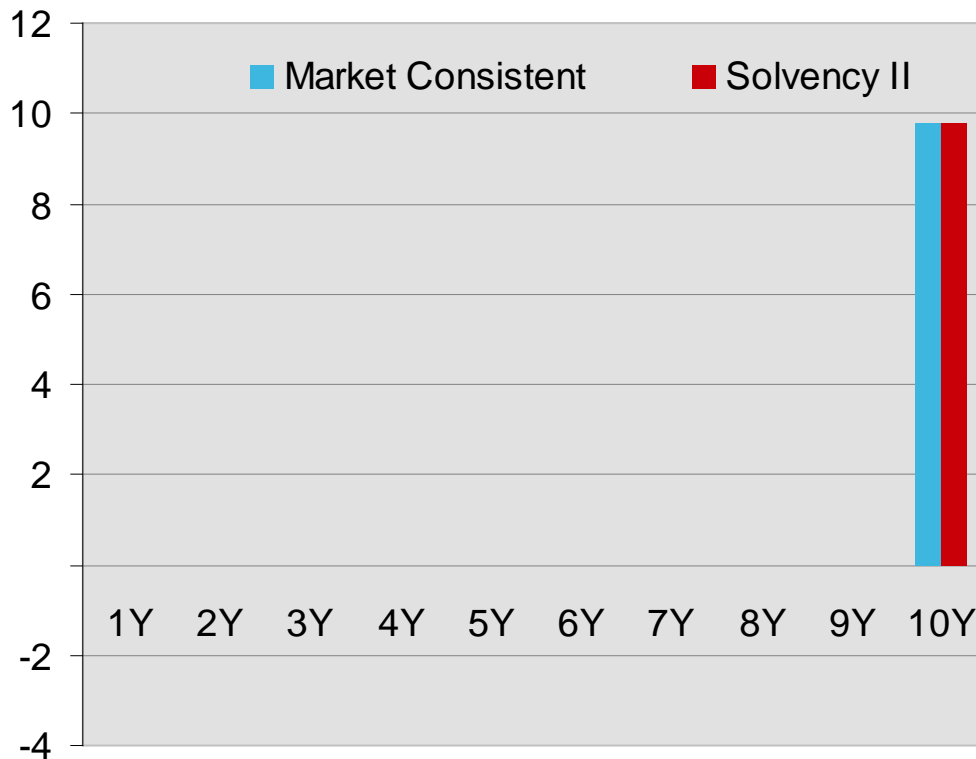
(And the other way around)



Economic hedge vs. Solvency II hedge

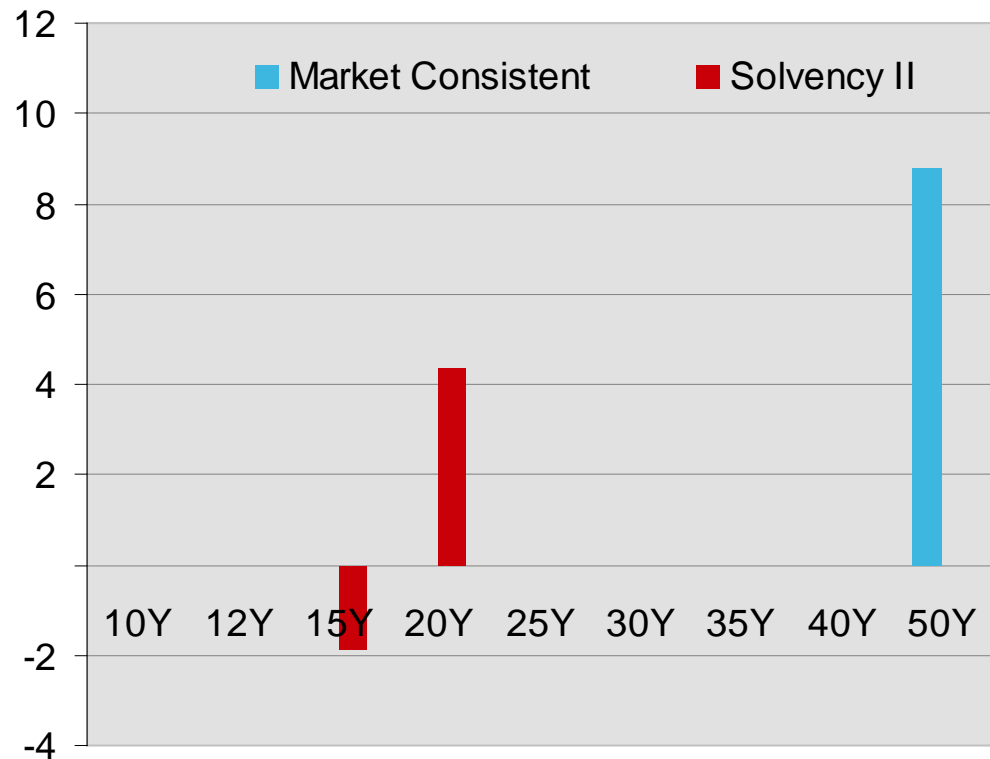
10yr bullet liability cashflow

Hedge Notional €m



50yr bullet liability cashflow

Hedge Notional €m

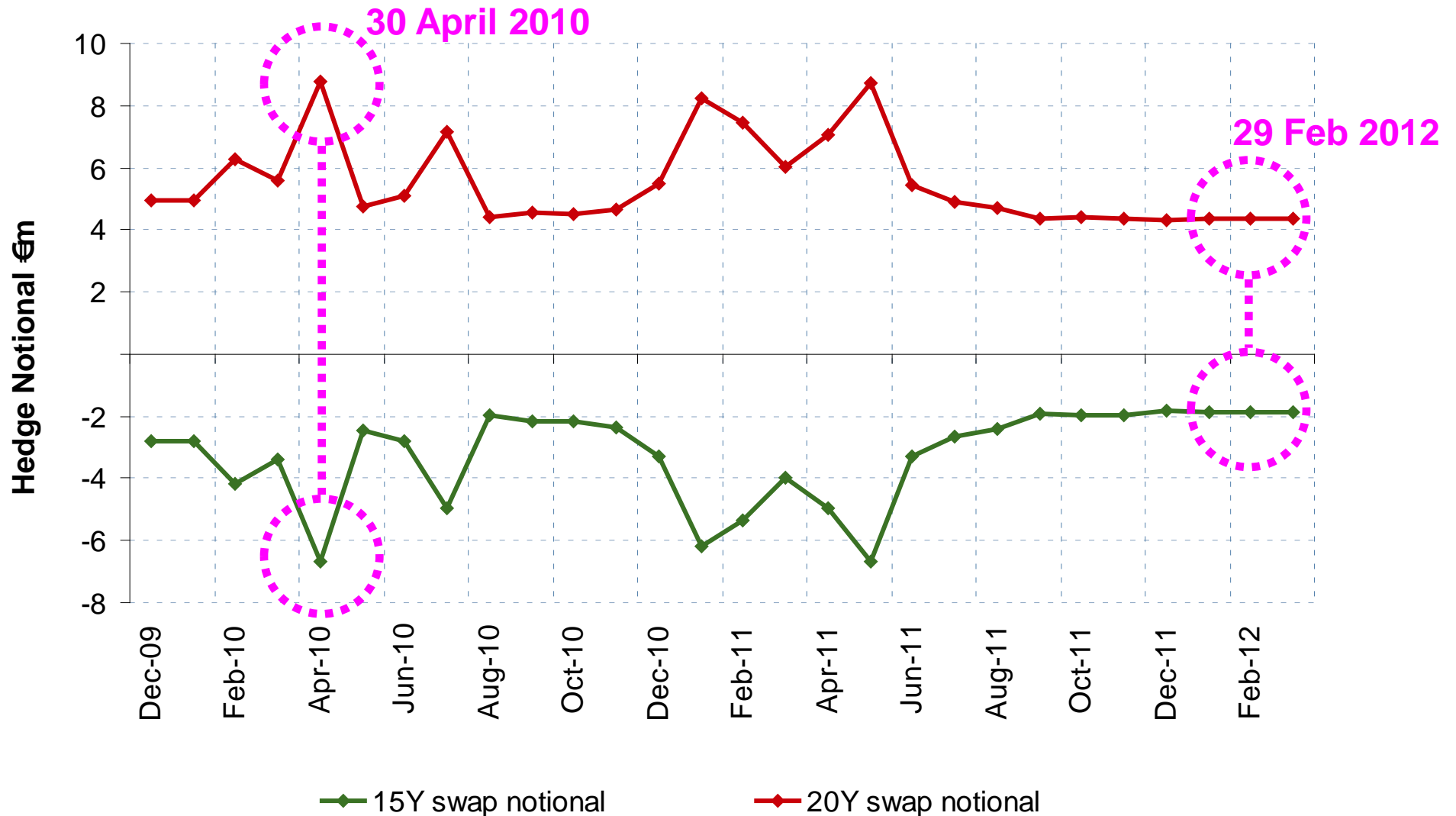


Material drop-off in sensitivity to interest rates

PV01's	Swap curve	Solvency II (20yr LLP, 10yr convergence)
Bullet liability 10yr	100%	101%
Bullet liability 20yr	100%	102%
Bullet liability 30yr	100%	66%
Bullet liability 50yr	100%	29%

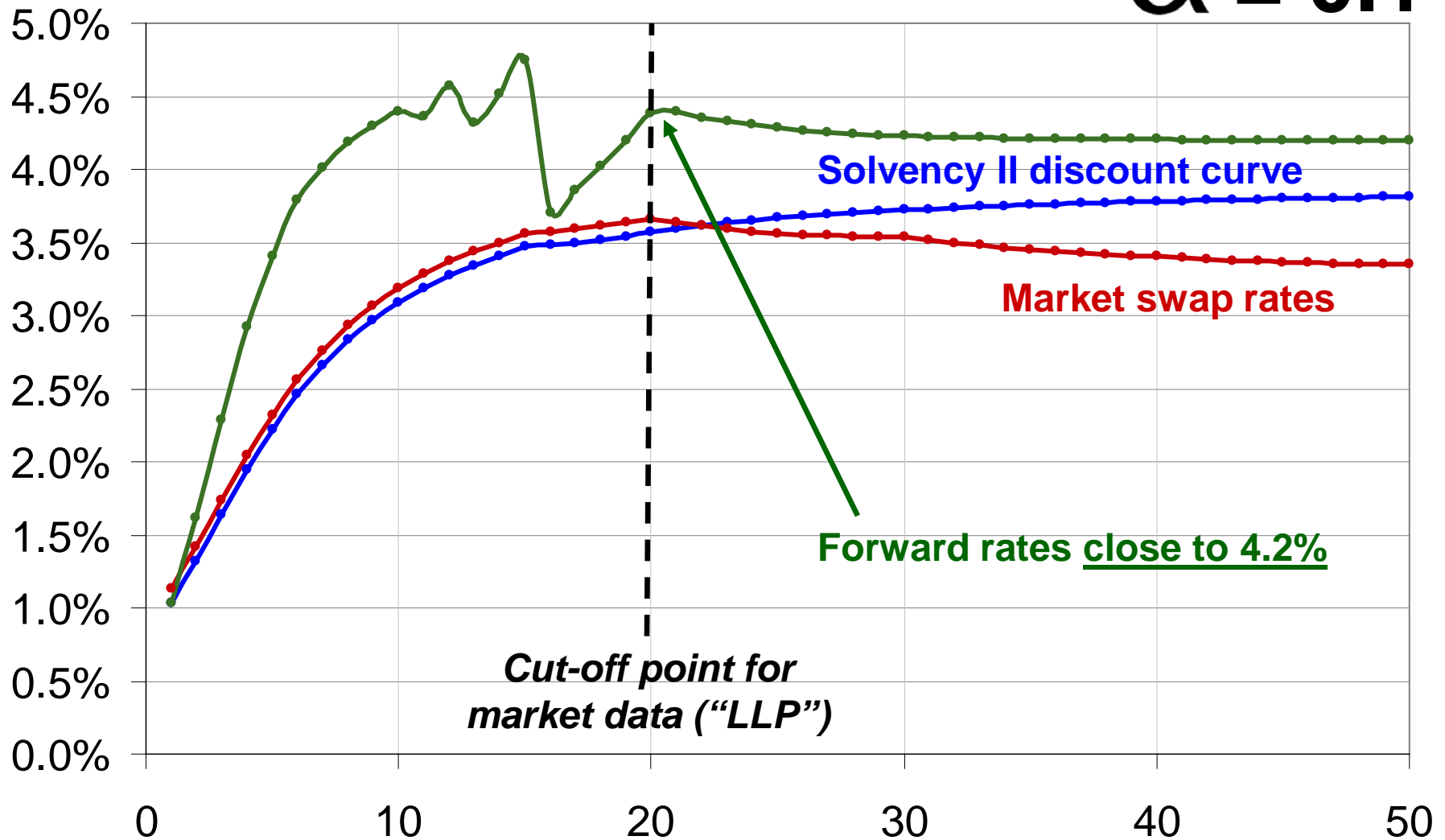
Robustness of the hedge over time

Hedge notionals – Large degree of volatility over past 2 years

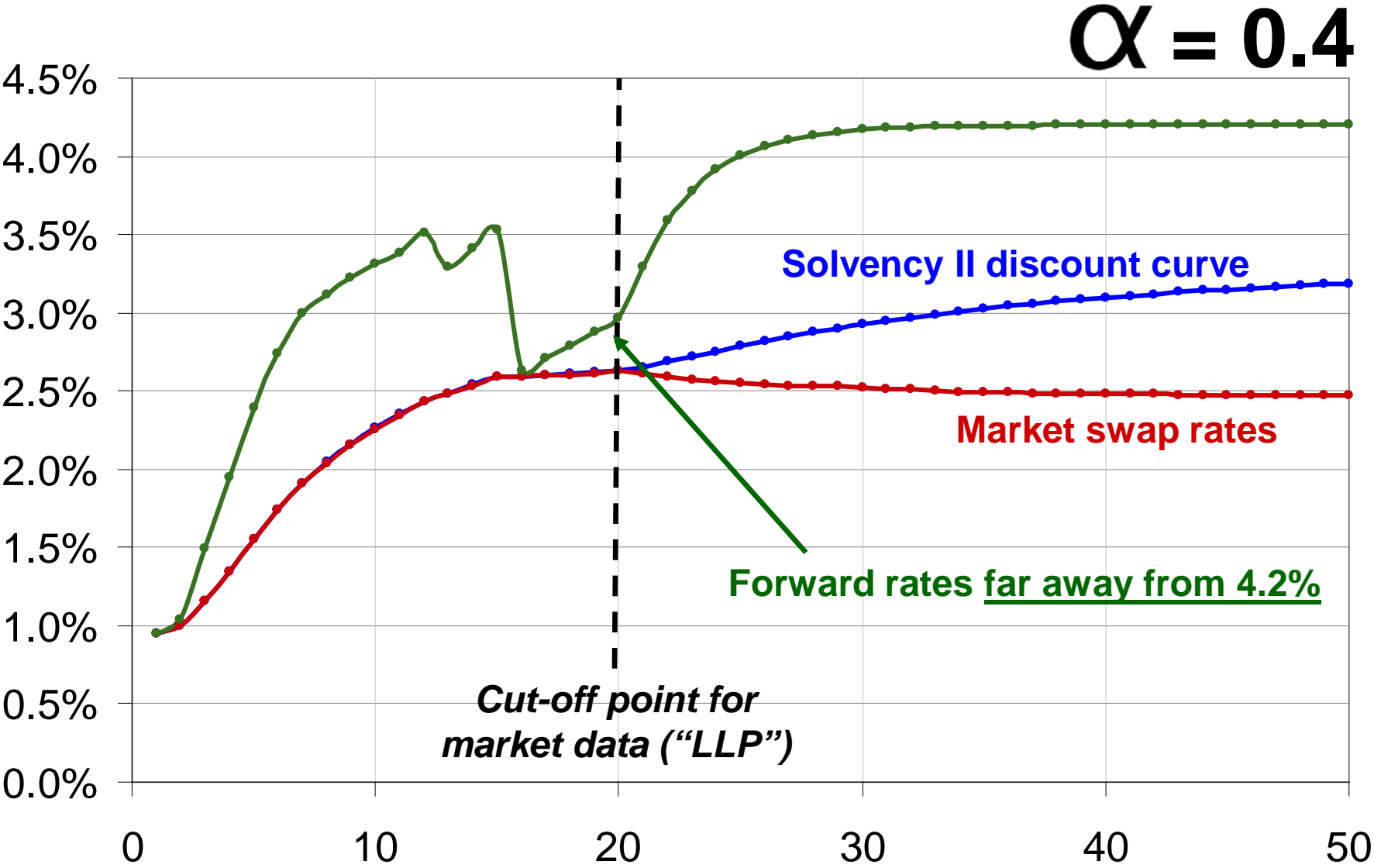


30 April 2010

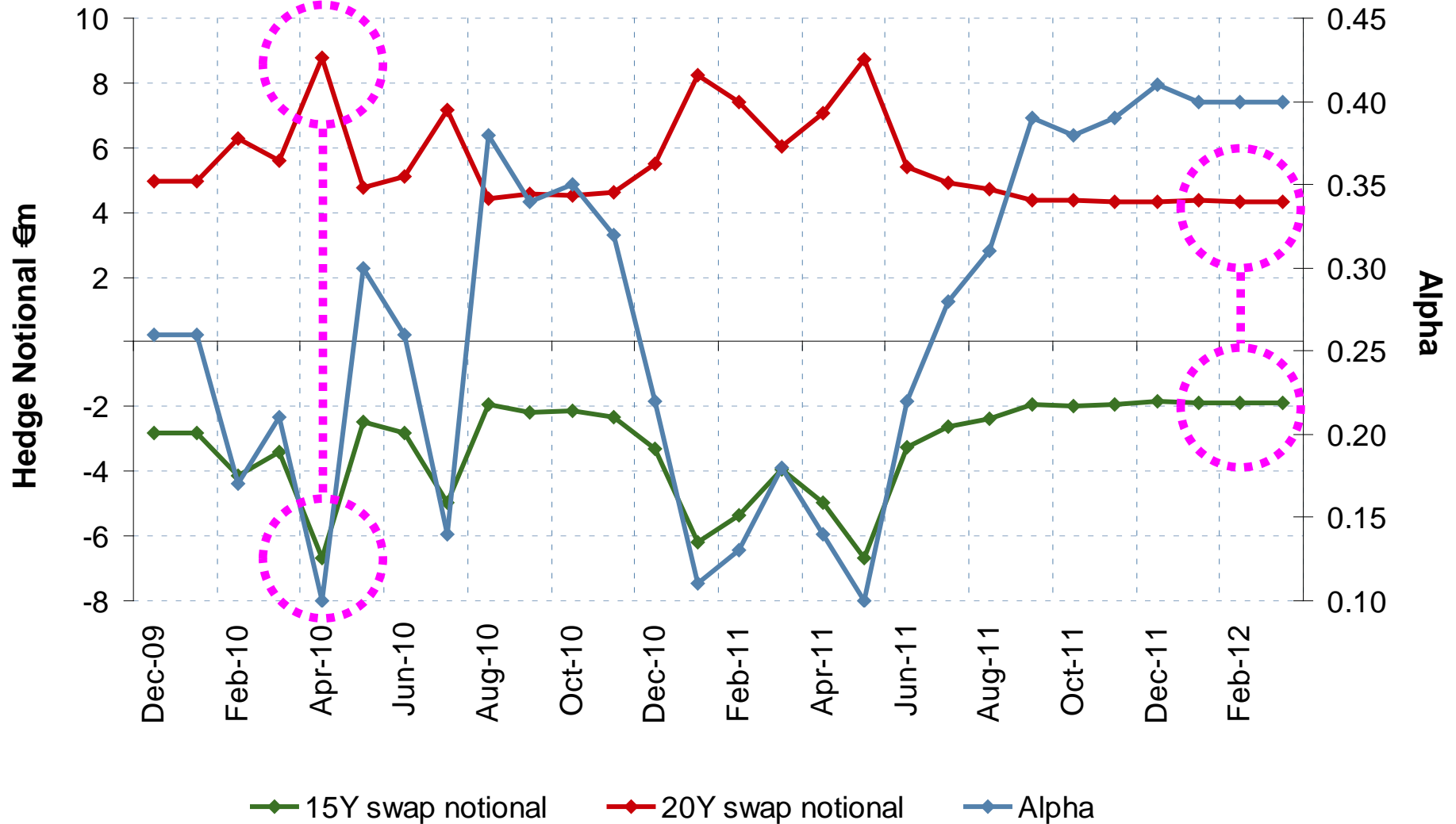
$\alpha = 0.1$



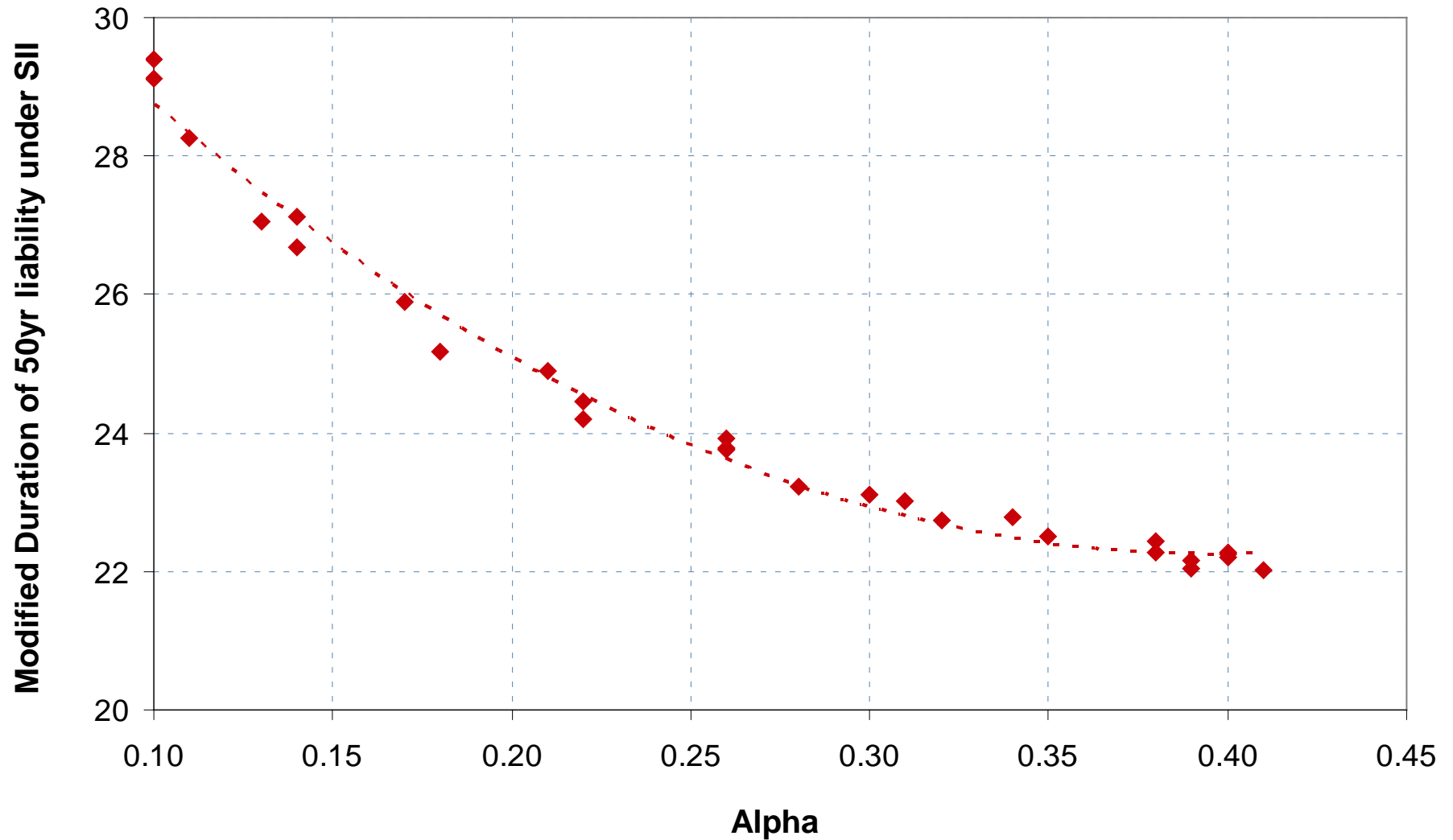
29 February 2012



Relationship between hedge notionals and “Alpha”

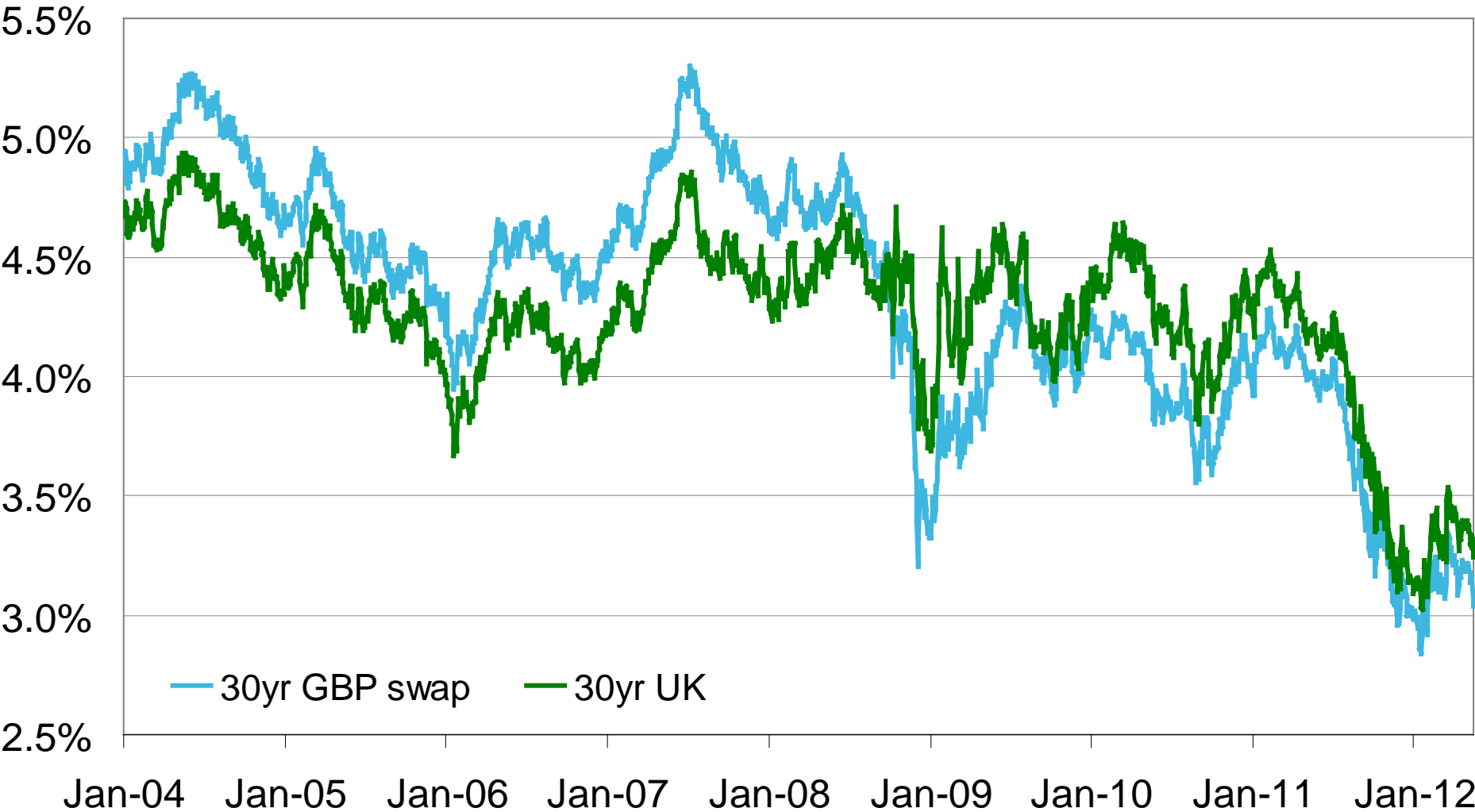


Relationship between hedge liability duration and “Alpha”

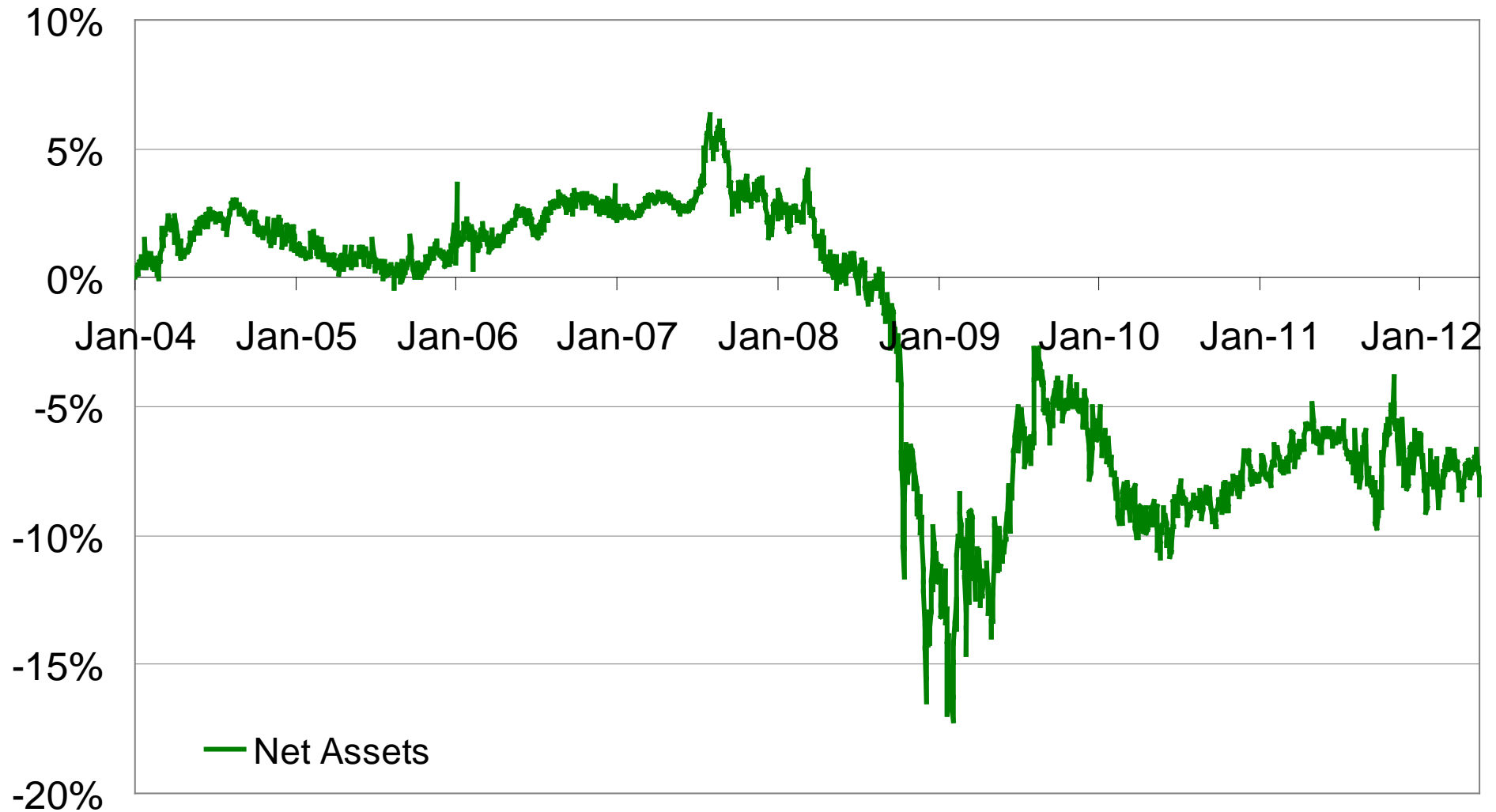


Other (practical) considerations

30yr gilt yield vs. 30yr swap rate



Government bonds – Not a duration product in a swaps-based world



Other practical considerations

- How to construct an appropriate hedge portfolio
- Conflicting metrics
- Implementation
- Active management of interest rate risk?
- Central clearing (ESMA)
- Individual circumstances

Q&A

