Matching adjustment
Volatility adjustment

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Components of the risk-free rate

Reference rate
- Libor swaps not sovereigns
- OIS swaps not sufficiently DLT
- Libor risk via CRA

AND

Credit Risk Adjustment
- Smoothed over time

OR

Volatility adjustment
- To counter pro-cyclicality
- Industry portfolio

Ultimate forward rate
- Extrapolation past Last Liquid Point
- To counter pro-cyclicality and illiquid markets

OR

- UFR before MA

Matching adjustment
- Own portfolio
- For illiquid liabilities and buy-to-hold assets

- UFR after VA

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Matching adjustment

Principles

Rules

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Volatility adjustment

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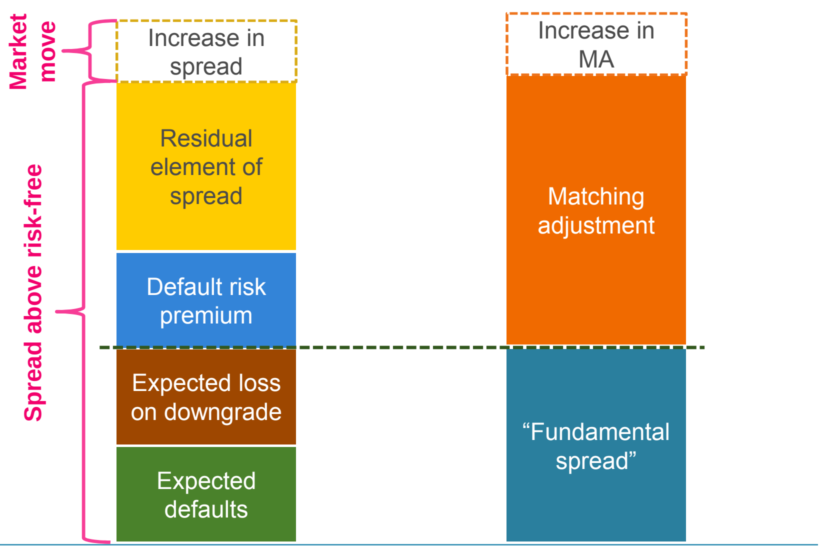
Matching adjustment

Matching adjustment 101



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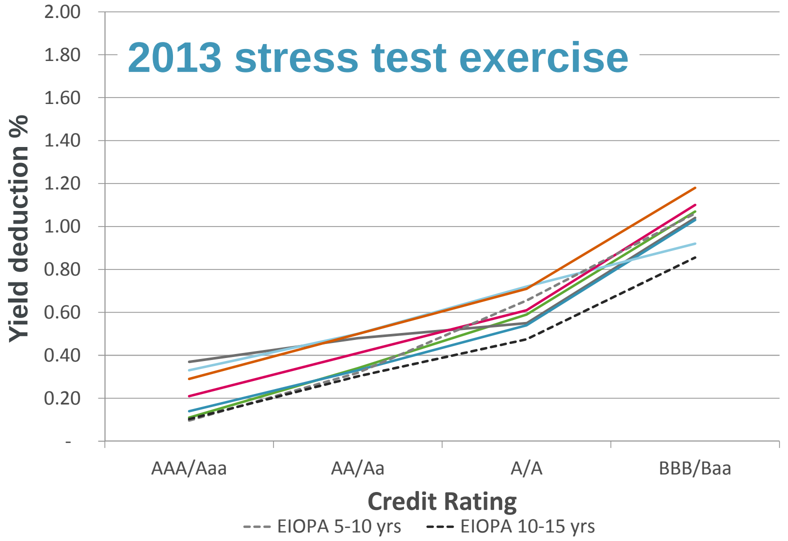
Fundamental spread vs. Solvency I



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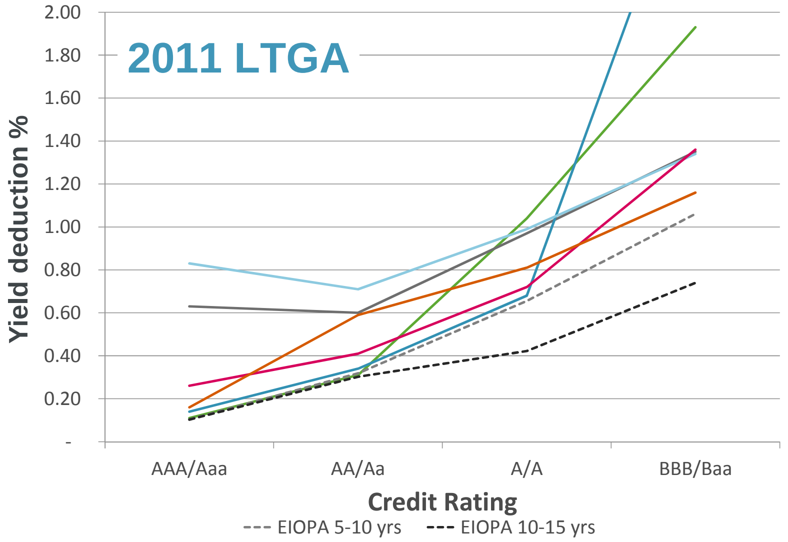
Fundamental spread vs. Solvency I



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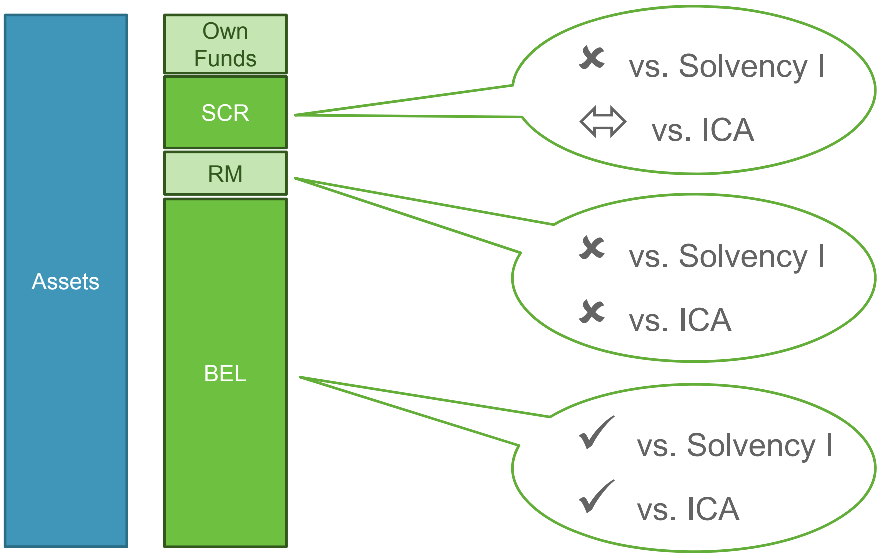
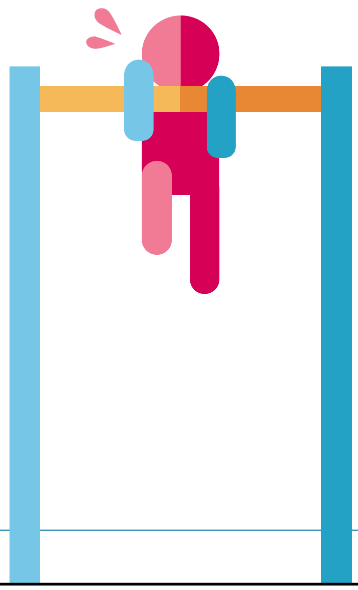
Sizing up the impacts

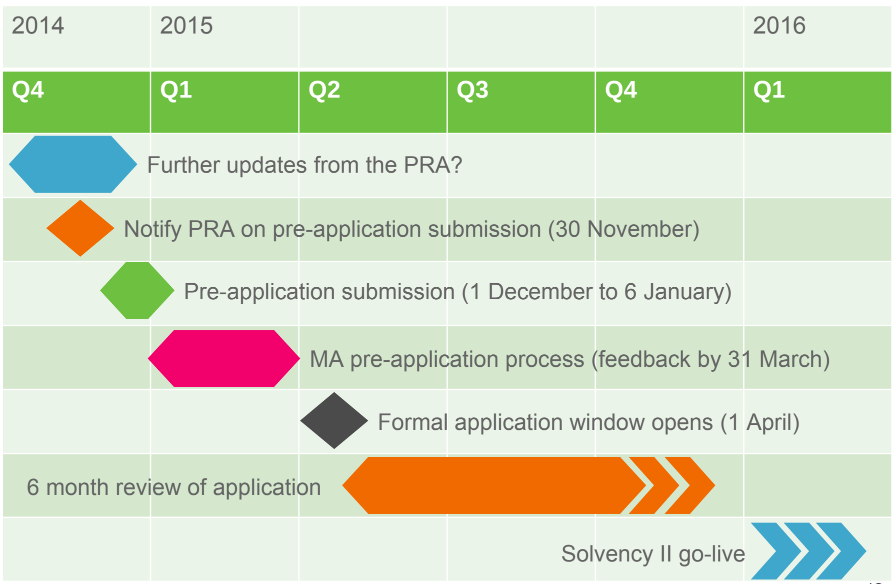
31/12/2013 (£m)	Solvency I	ICA	Solvency II with MA
BEL	17.38	16.82	16.78
MADs	0.61	-	-
Risk margin	-	-	0.97
Technical provisions	**17.99**	**16.82**	**17.75**
Solvency margin	0.70	-	-
Credit risk SCR	-	1.39	1.81
Longevity SCR	-	1.24	1.23
Diversification	-	(0.55)	(0.61)
Total capital	**0.70**	**2.08**	**2.43**
Total assets	23.00	23.00	23.00
Own funds	4.31	4.10	2.82
Solvency ratio	123%	122%	113%



Applying to use the matching adjustment



Timeline



If Spiderman was the regulator …

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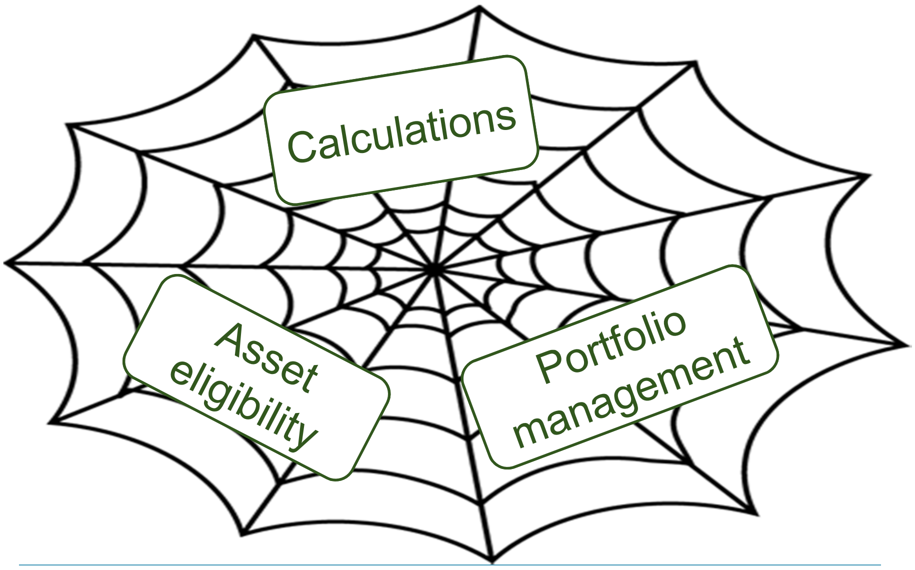
Getting caught in the web



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What needs to be in the application

- Eligible assets
- Eligible liabilities
- Portfolio management
- Liquidity plan

Portfolio management

Dingbat 1

Dingbats 2 and 3

Dingbat 4

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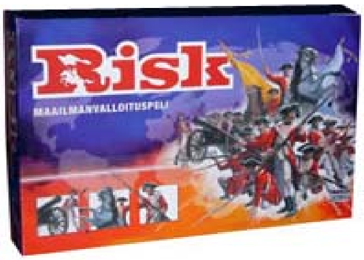
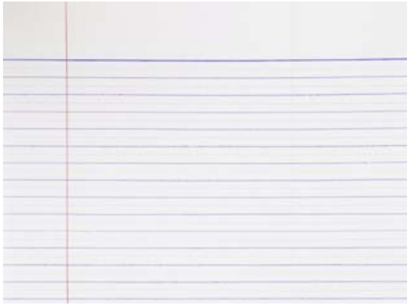
Other issues – Dingbat 5





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Risk margin impacts

31/12/2013 (£m)	Solvency II without MA	Solvency II with MA	Solvency II with MA (credit in risk margin)
BEL	18.26	16.78	16.78
Risk margin	1.16	0.97	1.92
Technical provisions	**19.43**	**17.75**	**18.71**
Δ Technical provisions		**(1.68)**	**0.96**
Total capital	**3.45**	**2.43**	**2.43**
Δ Capital		**(1.02)**	**-**

Asset eligibility

- Equity release mortgages
- Sale and leaseback
- Bonds with market standard redemption clauses
- Prepayable loans
- Callable bonds
- Non £-denominated bonds

Solution 0
Trial applications

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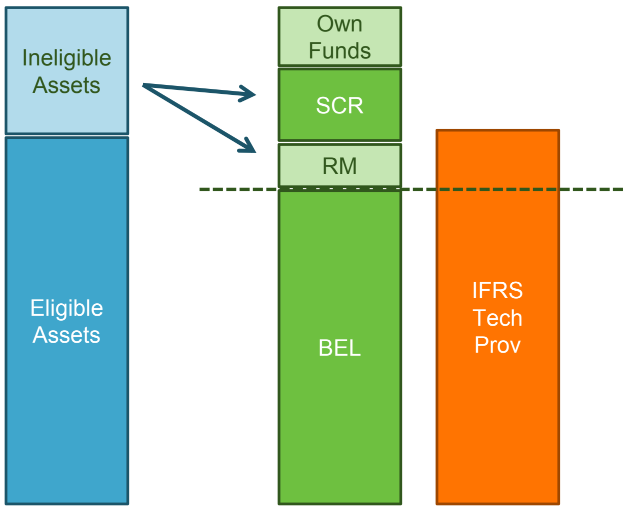
Solution 1
Assign against SCR or Risk Margin



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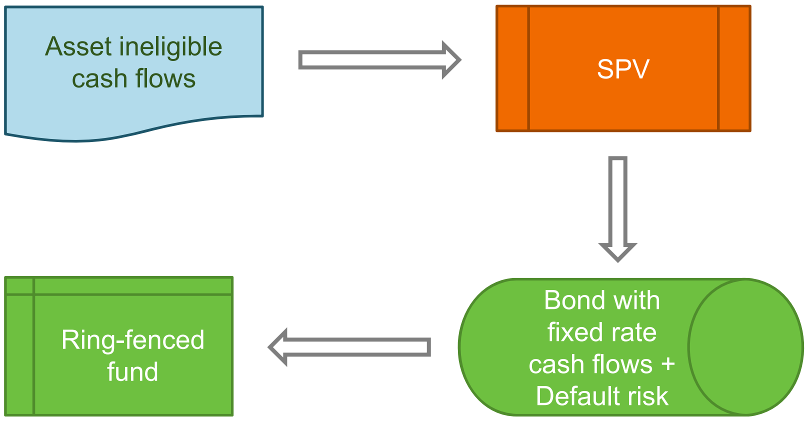
Solution 2
Provision for ineligibility risk with default risk



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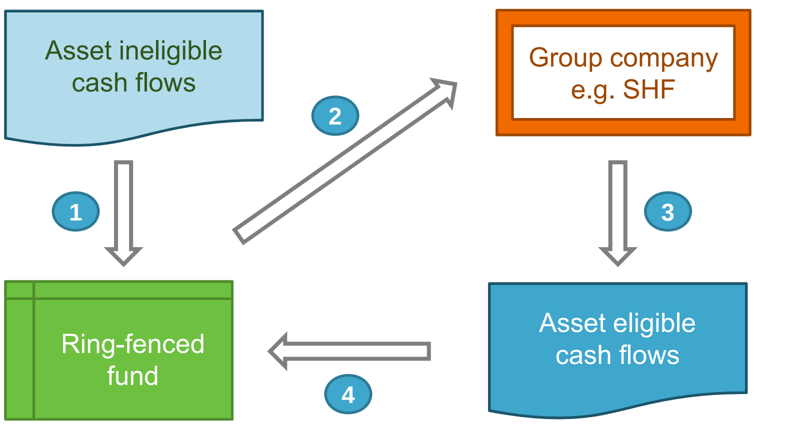
Solution 3a
Hedge ineligibility risk internally



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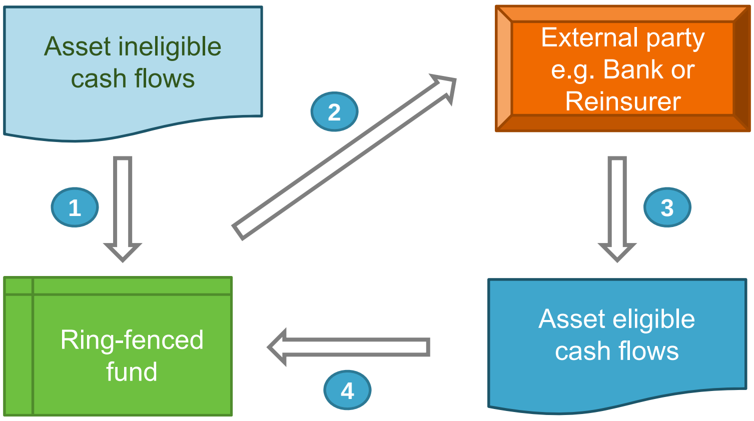
Solution 3b
Hedge ineligibility risk externally



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Solution 4
Do something else!

- Sell ineligible assets
- Transitionals
- Don’t use MA … use the VA instead

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Volatility adjustment

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Components of the risk-free rate

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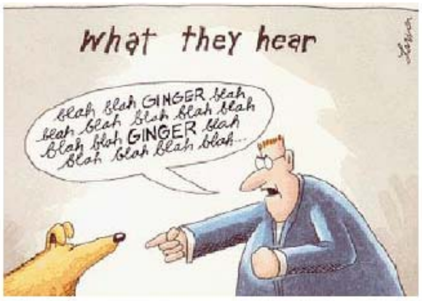
What we say to dogs …
... and what they hear



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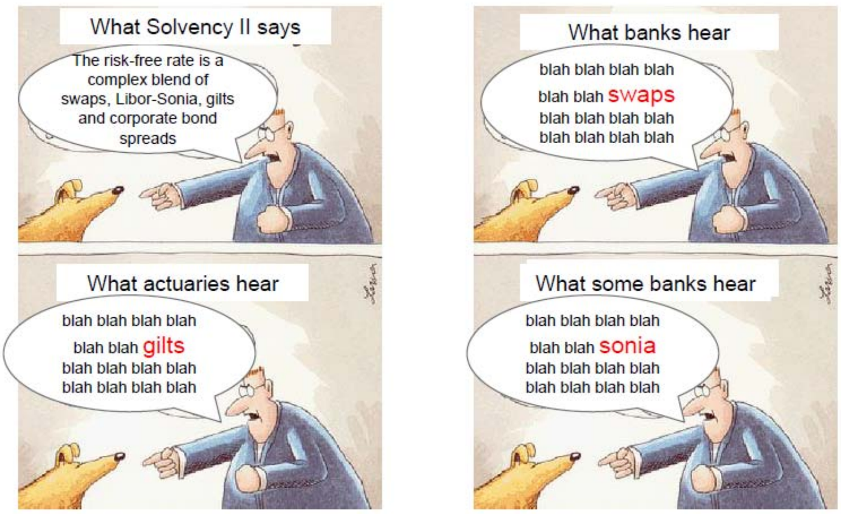
What Solvency II says …
… and what different people hear



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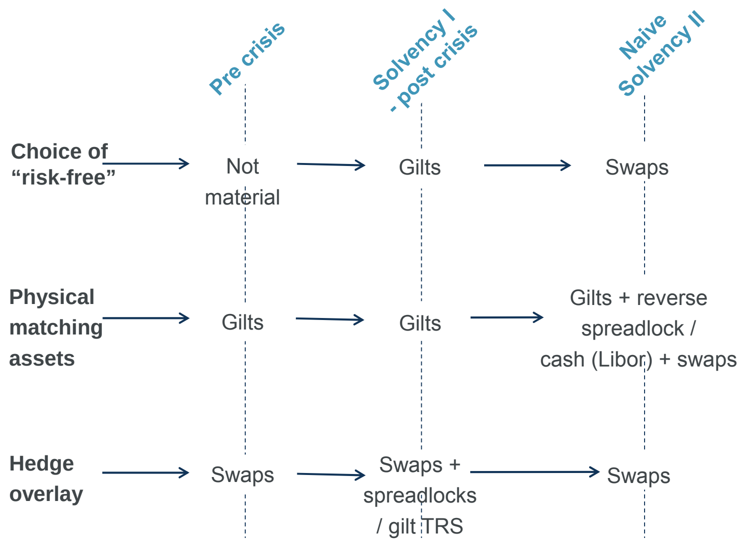
Evolution of “risk-free” hedging debate



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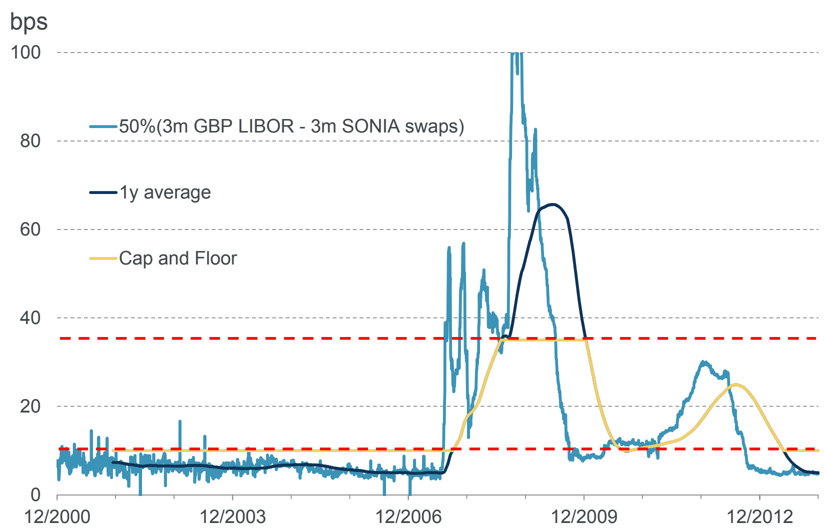
Credit risk adjustment



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Volatility vs. Matching adjustment

Volatility adjustment		Bond-Yield		Matching adjustment
• Less generous	65%	Residual (Liquidity...)	100%	• More generous
• Less restrictive	65%	Default risk premium	100%	• Highly restrictive
• Basis risk	✗	Downgrade risk	✗	• No basis risk
• No SCR offset	✗	Expected defaults	✗	• Reduced SCR – but Risk Margin?
Investment implications • Shorter-dated credit • Long-dated "risk-free" overlays		Risk-free rate		Investment implications • Long-dated closely-matched credit

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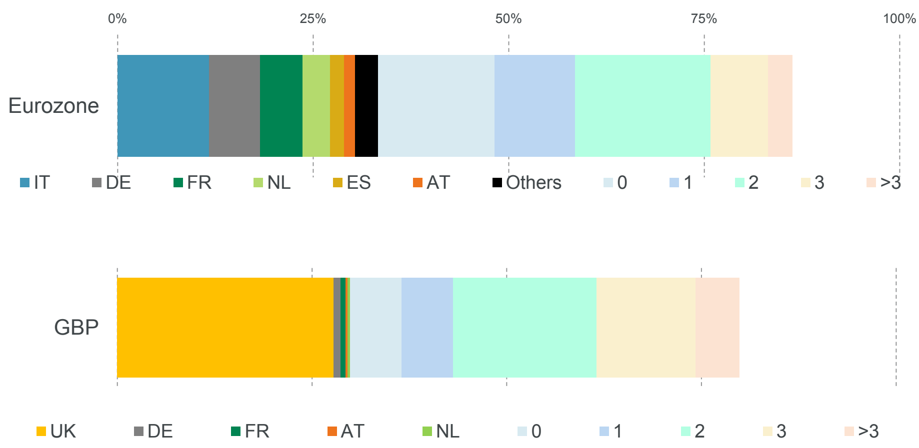
Volatility Adjustment – reference portfolios



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Bit of obligatory maths ….

Δ risk-free rate = Δ reference-rate + Δ credit risk-adjustment + Δ volatility adjustment

Δ risk-free rate = Δ Libor swap rate + Δ credit risk-adjustment
+ 65% * w_govt * Δ risk-corrected spreads on gilts
+ 65% * w_corp * Δ risk-corrected spreads on corporates

The risk-correction is essentially fixed so:

Δ risk-free rate = (1- 65% * (w_corp+w_govt))* Δ (Libor swap rate + credit risk-adjustment)
+ 65% * w_govt * Δ yields on gilts
+ 65% * w_corp * Δ yields on corps

Δ credit risk-adjustment = 50% * Δ 1y average of Libor-Sonia, with a max variation of 25bps (35bps cap - 10bps floor)

Using the weights for GBP in the LTGA, we find

Δ risk-free rate = 47.6% * Δ Libor swap rate
+ 19.8% * Δ gilt yield
+ 32.6% * Δ corporate yields
+ 23.8% * Δ 1y average of Libor-Sonia (max variation 12bps)

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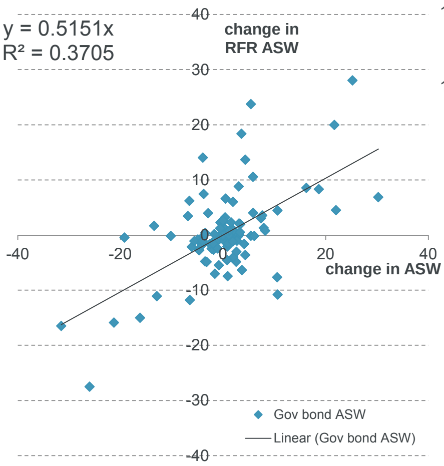
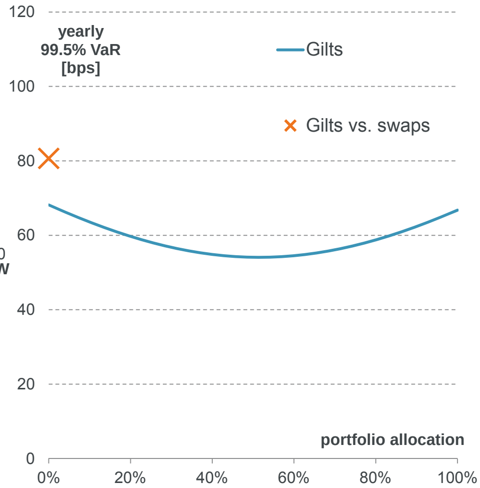
Hedging with just gilts or swaps





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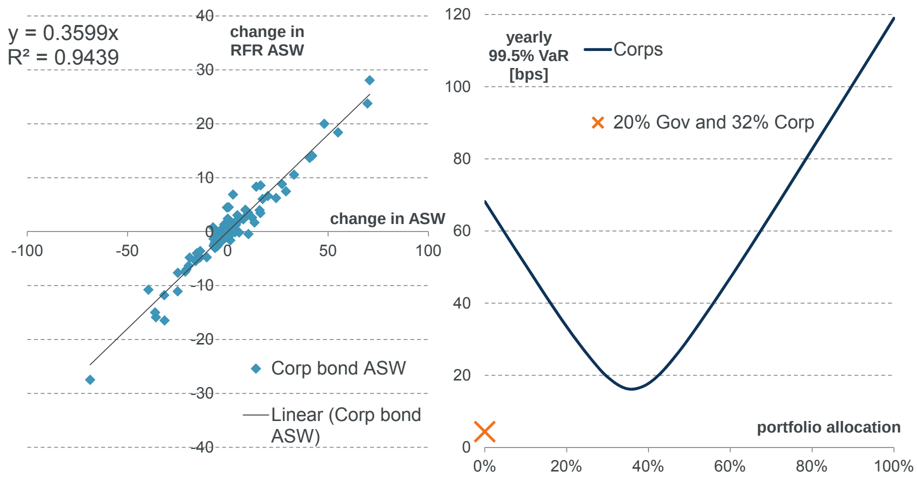
Adding corporate bonds into the mix



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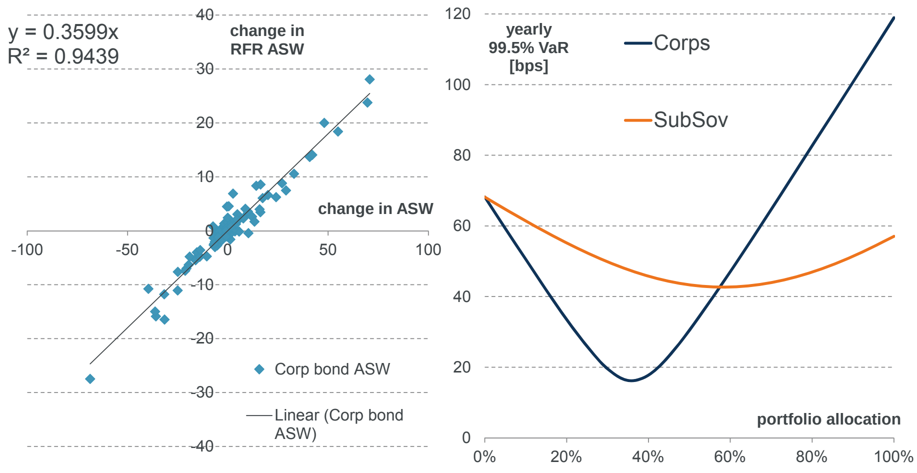
Adding sub-sovereigns into the mix



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Evolution of “risk-free” hedging debate

	Pre crisis	Solvency I - post crisis	Naive Solvency II	Final Solvency II
Choice of “risk-free”	Not material	Gilts	Swaps	Swaps + VA - CRA
Physical matching assets	Gilts	Gilts	Gilts + reverse spreadlock / cash (Libor) + swaps	Blend of gilts, supras and swaps + cash
Hedge overlay	Swaps	Swaps + spreadlocks / gilt TRS	Swaps	Blend of swaps + gilts/supra TRS

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The thorny issue of approval

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Thank you!

Questions Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenters.

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