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Matching adjustment Volatility adjustment

Paul Fulcher
Ross Evans



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

- UFR after VA

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

Matching adjustment

Principles



Rules

Volatility adjustment



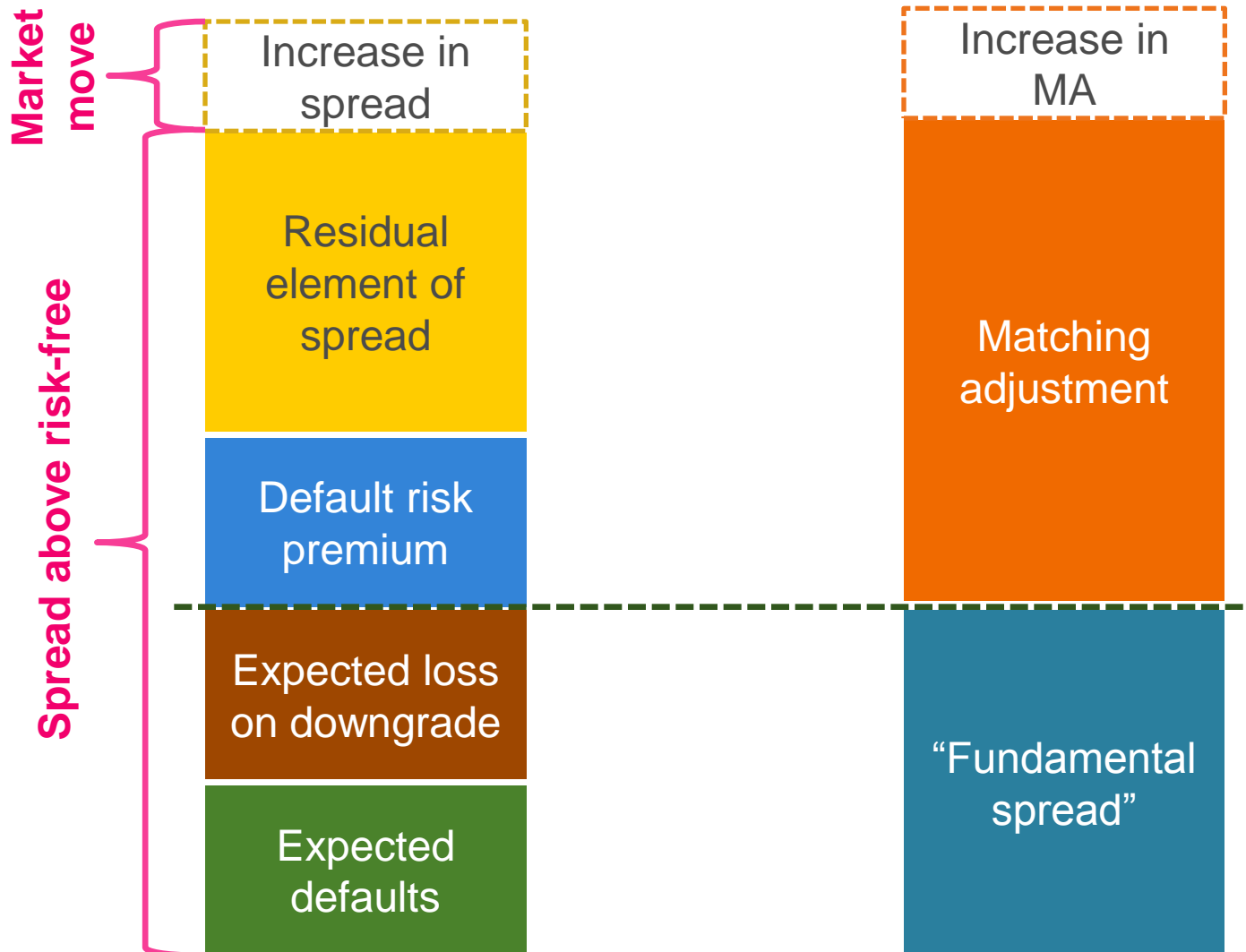


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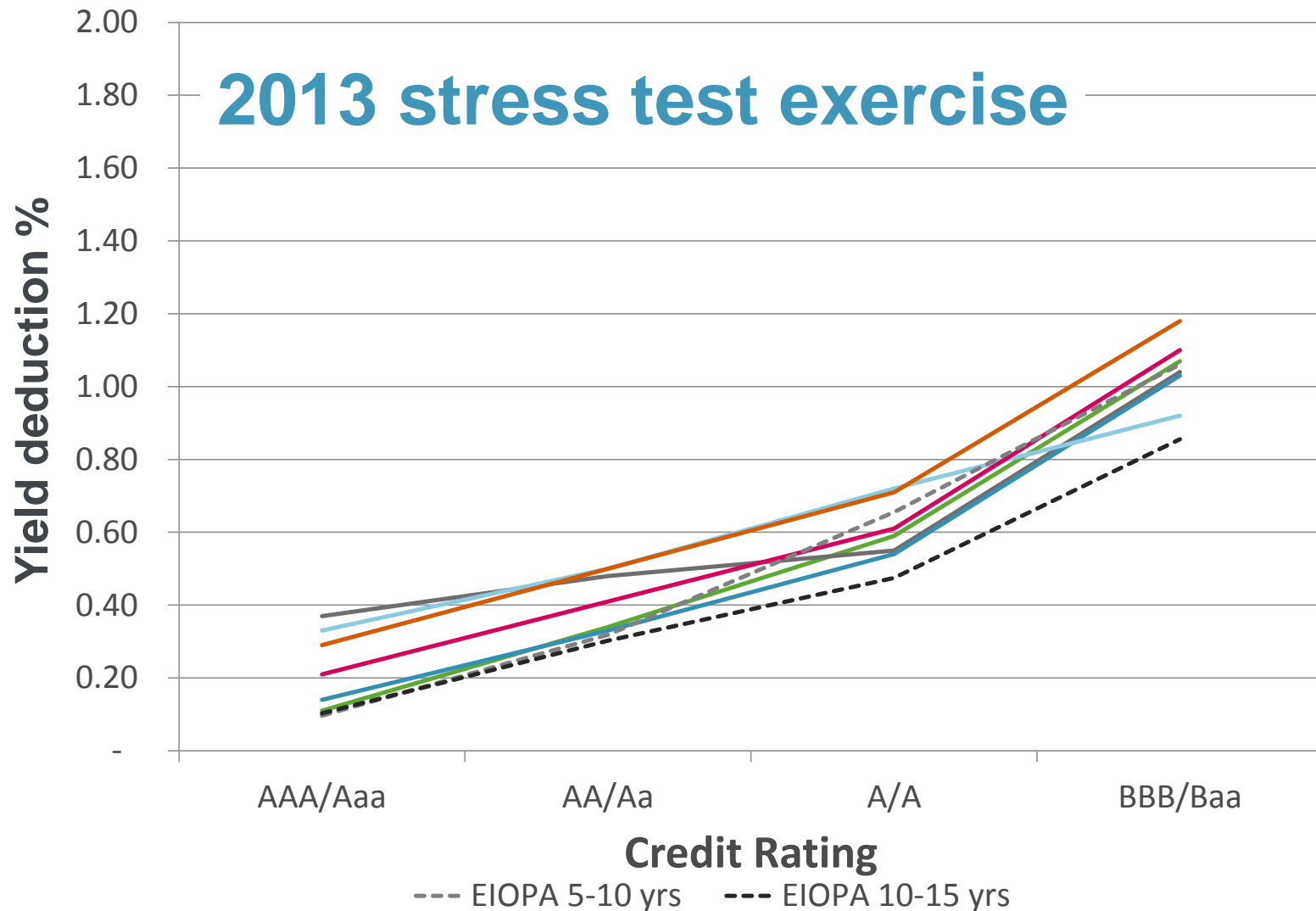
Matching adjustment

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

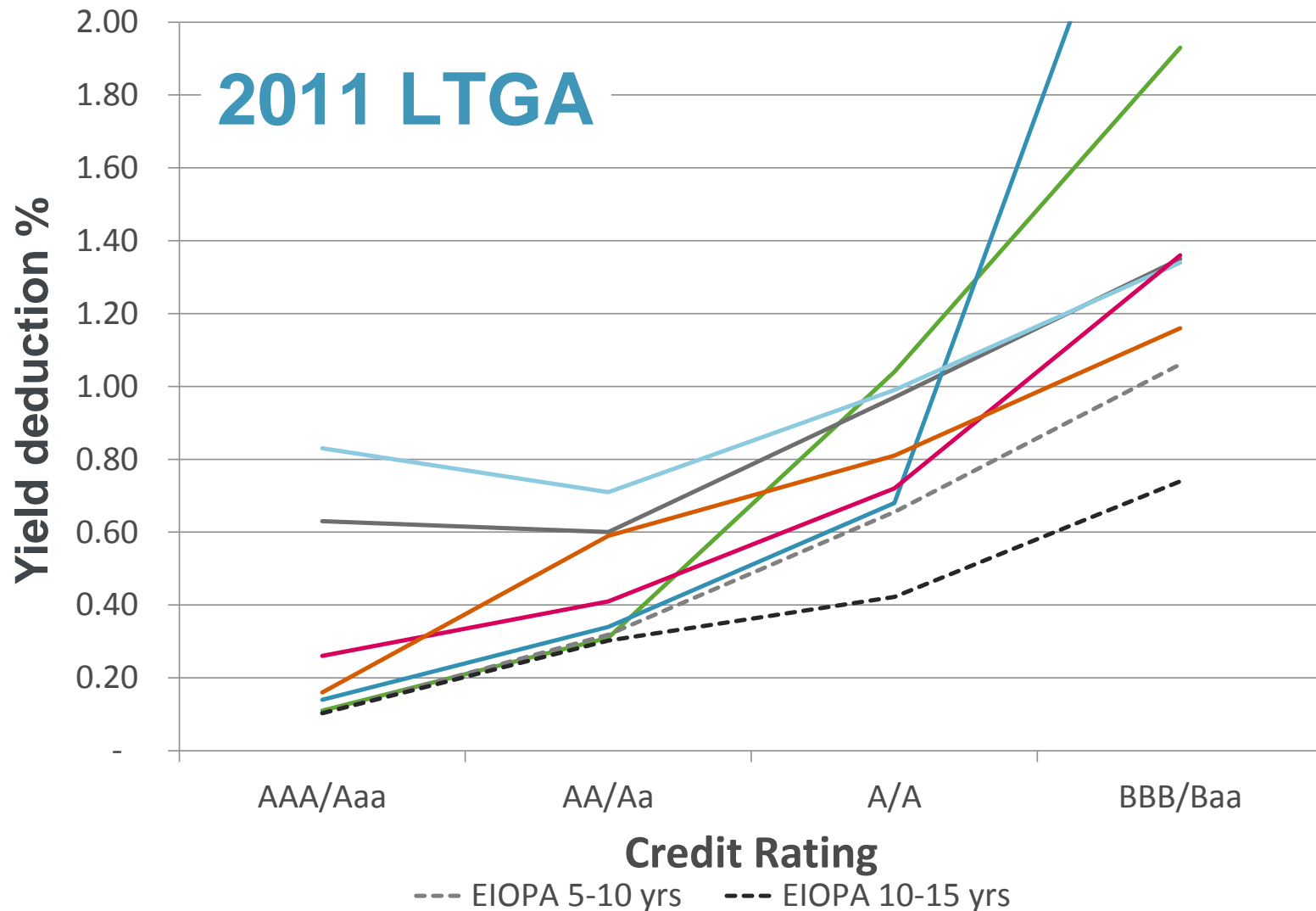
Matching adjustment 101



Fundamental spread vs. Solvency I

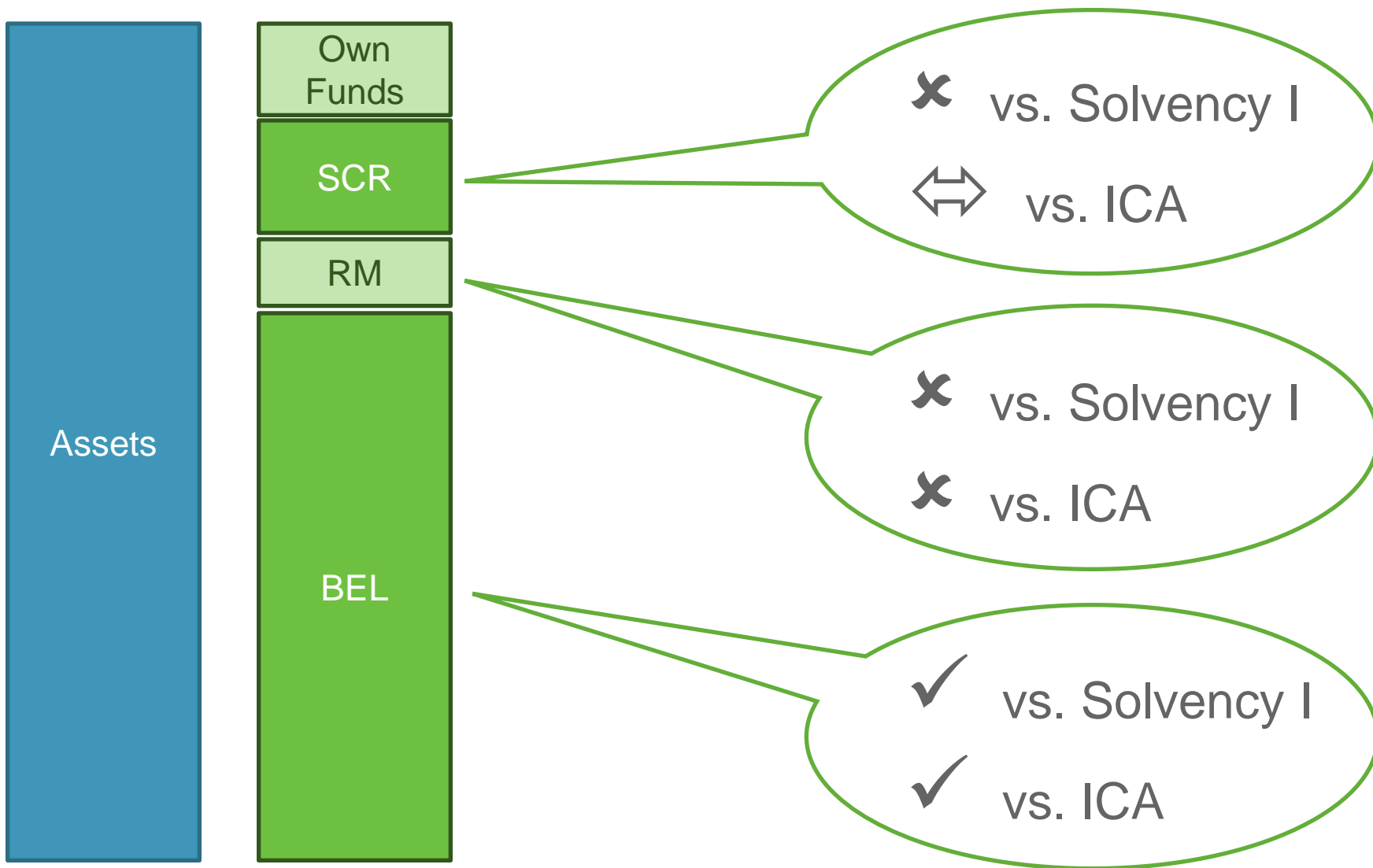


Fundamental spread vs. Solvency I

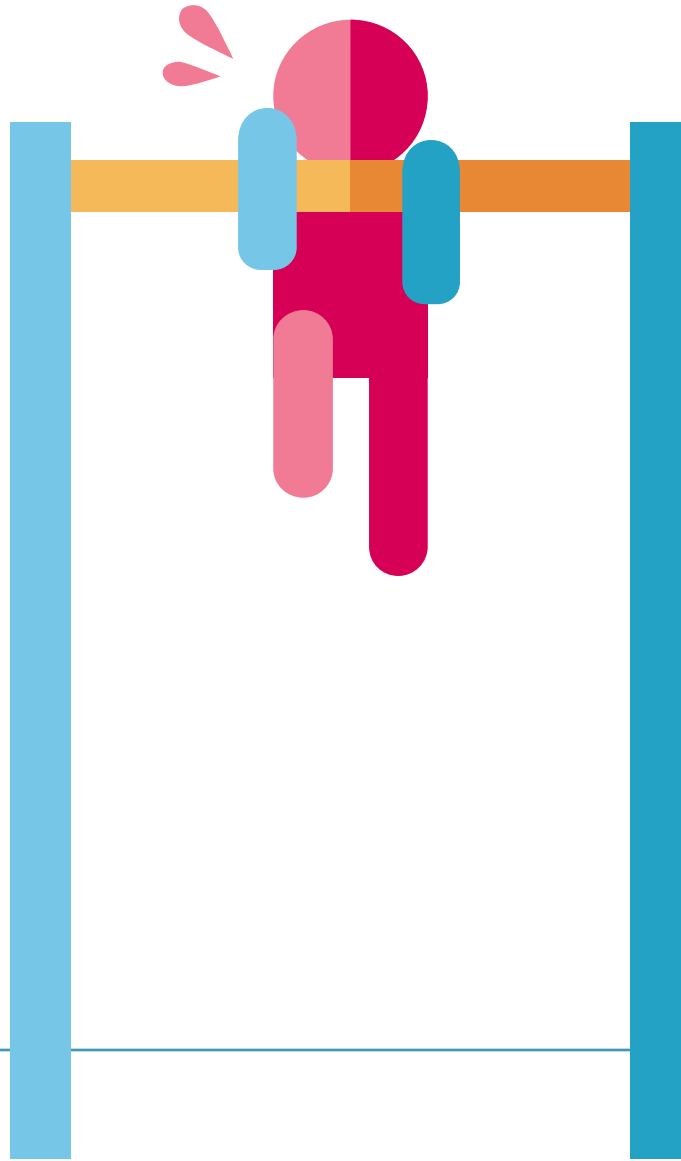


Sizing up the impacts

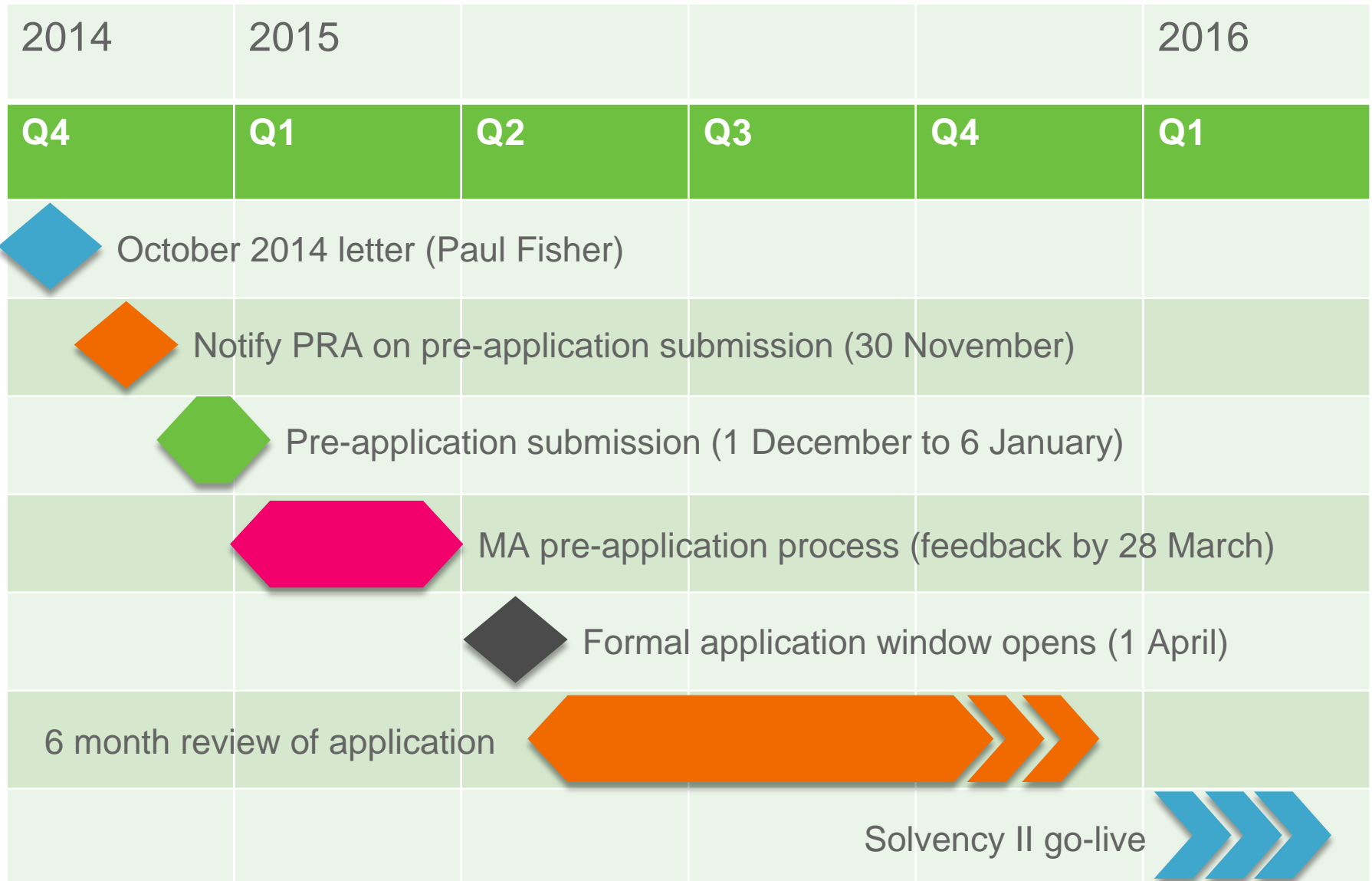
31/12/2013 (£m)	Solvency I	ICA	Solvency II with MA
BEL	17.38	16.82	16.78
MADs	0.61	-	-
Risk margin	-	-	1.16
Technical provisions	17.99	16.82	17.94
Solvency margin	0.70	-	-
Credit risk SCR	-	1.39	1.81
Longevity SCR	-	1.24	1.23
Diversification	-	(0.55)	(0.61)
Total capital	0.70	2.08	2.43
Total assets	22.50	22.50	22.50
Own funds	3.81	3.60	2.13
Solvency ratio	120%	119%	110%



Applying to use the matching adjustment



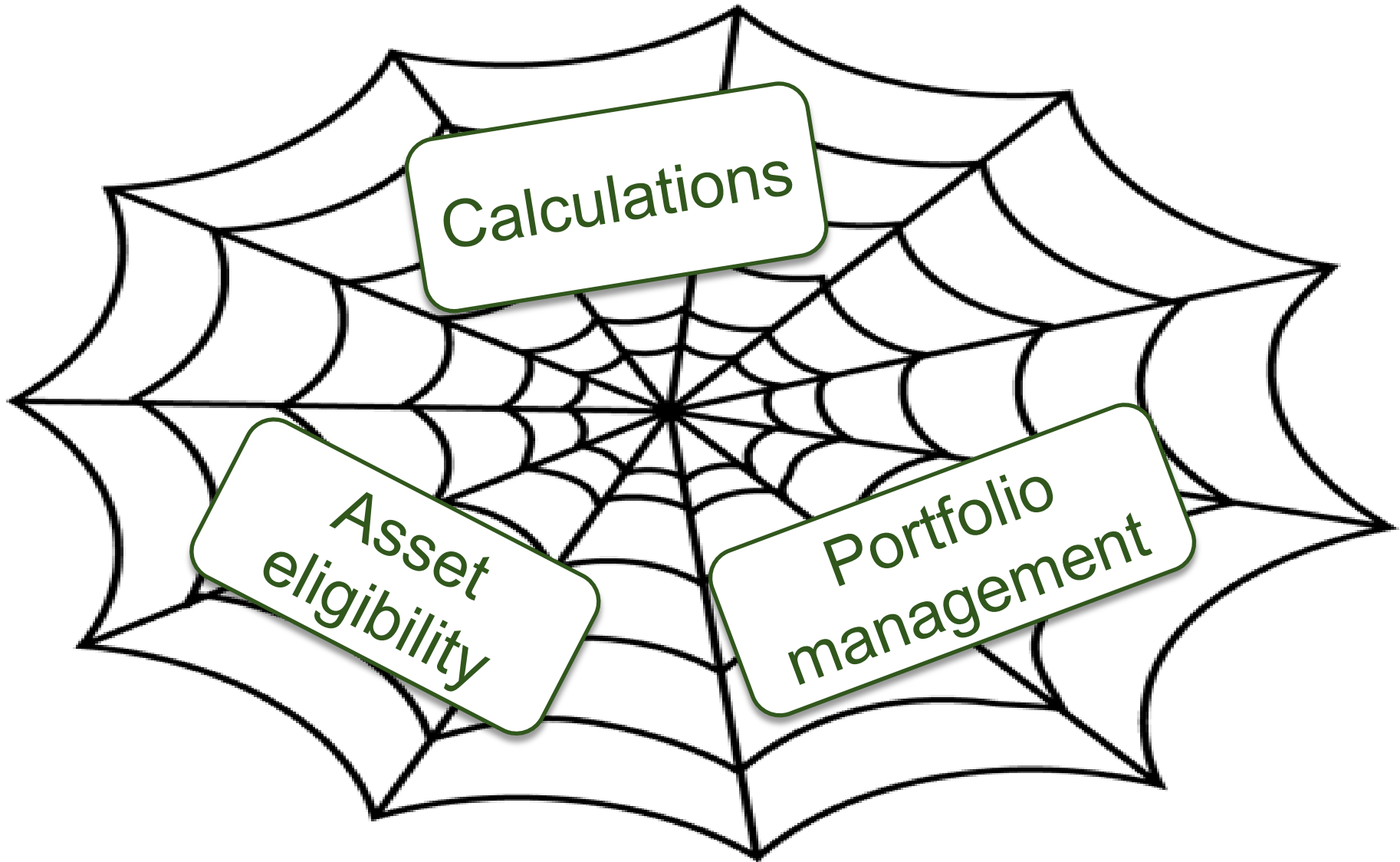
Timeline



If Spiderman was the regulator ...



Getting caught in the web



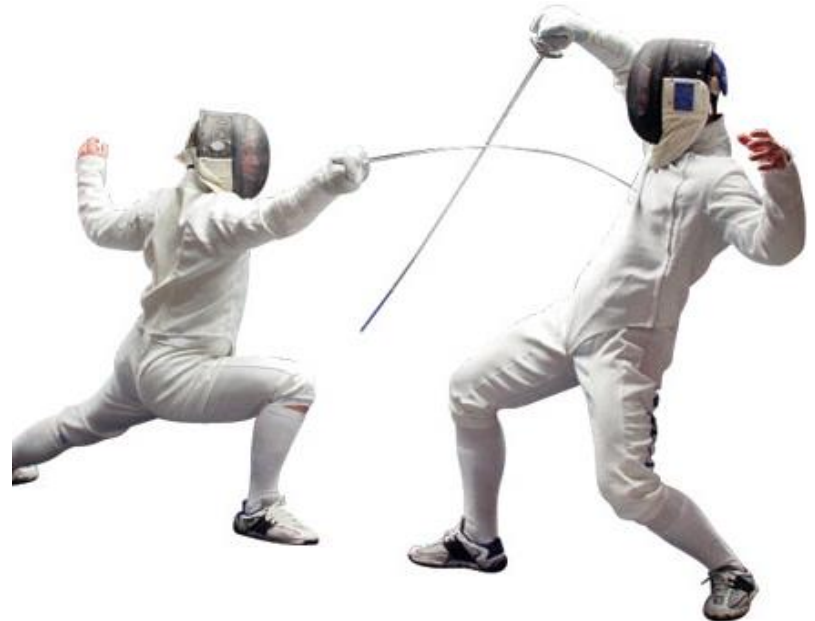
What needs to be in the application



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

Portfolio management

Dingbat 1



Dingbats 2 and 3



Dingbat 4



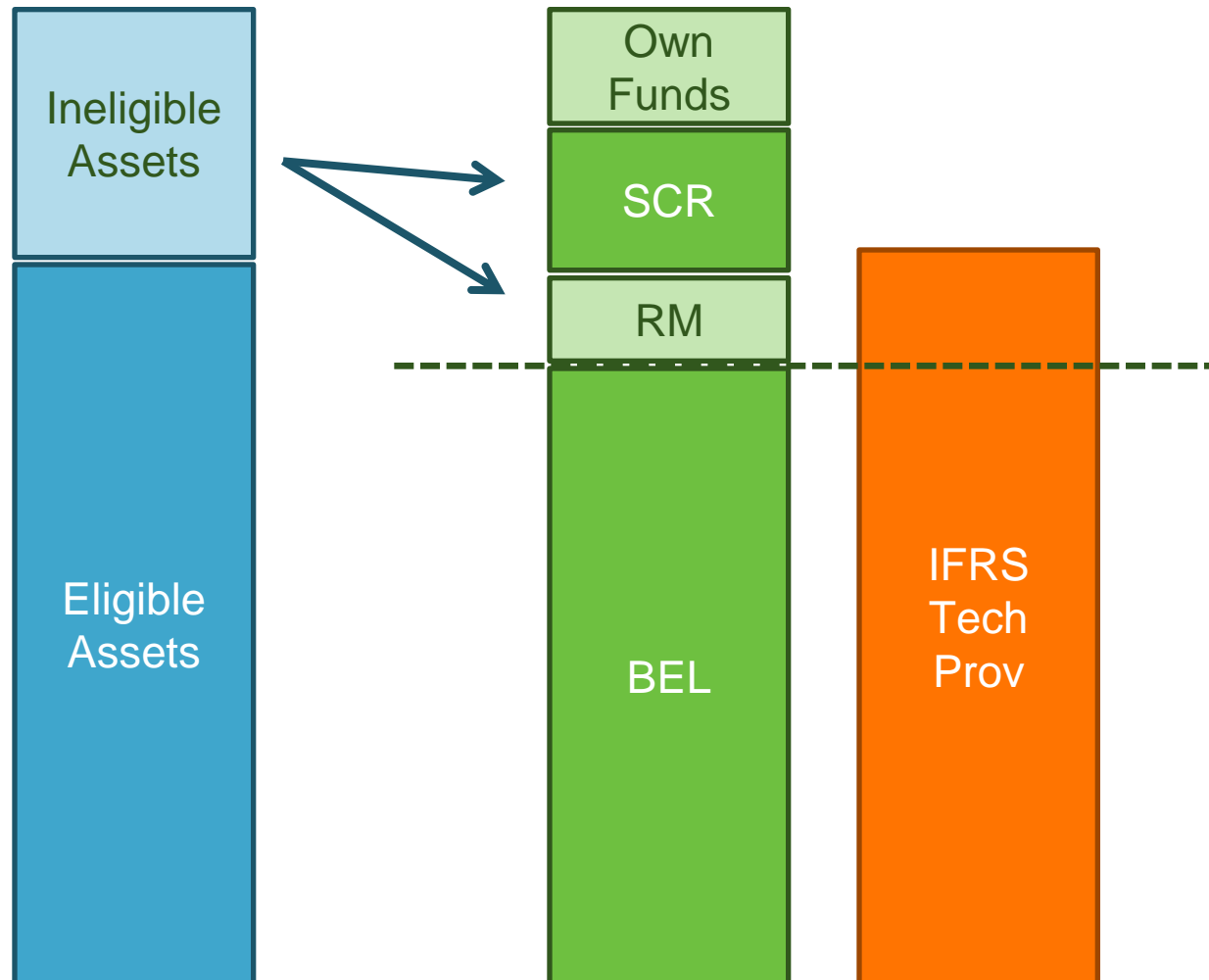
Asset eligibility

Feature	Example assets
Prepayment risk	Loans with prepayment options Equity release mortgages
Extension risk	Callable sub-debt
Property-dependent flows	Sale & leaseback Equity release mortgages
Mortality and morbidity risk	Equity release mortgages

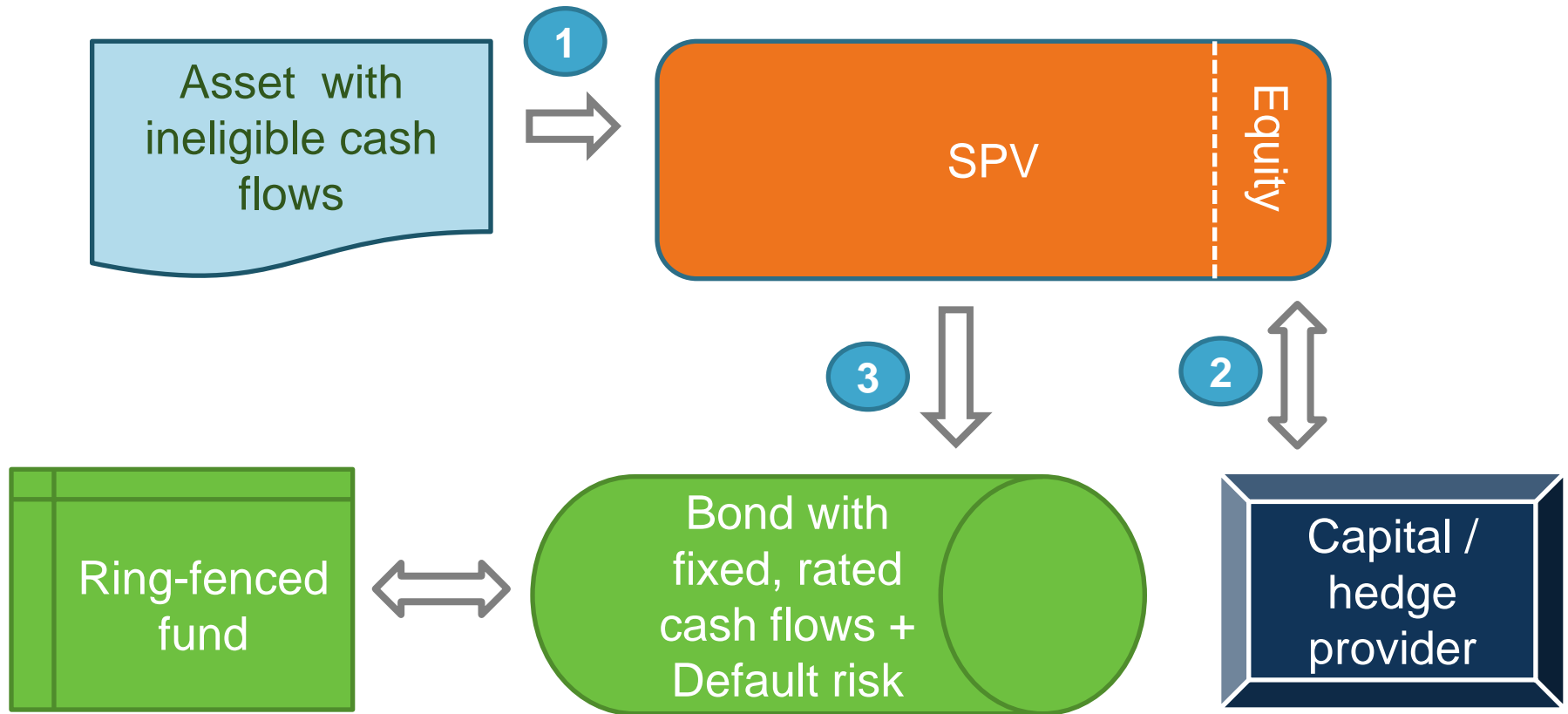
Solution 0 – Trial applications



Solution 1 – Assign against SCR or Risk Margin



Solution 2 – Restructuring options



Solution 3 – Do something else!

- Sell ineligible assets
- Transitionals
- Don't use MA ... use the VA instead



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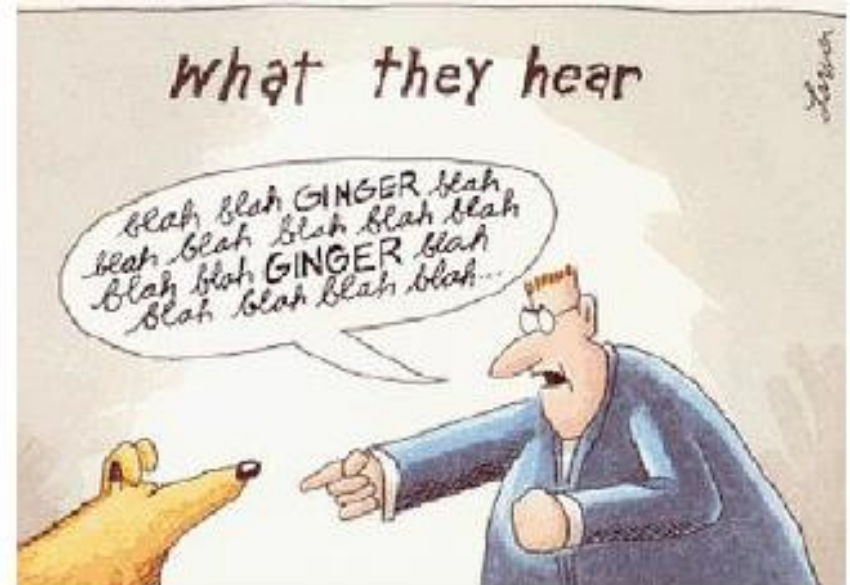
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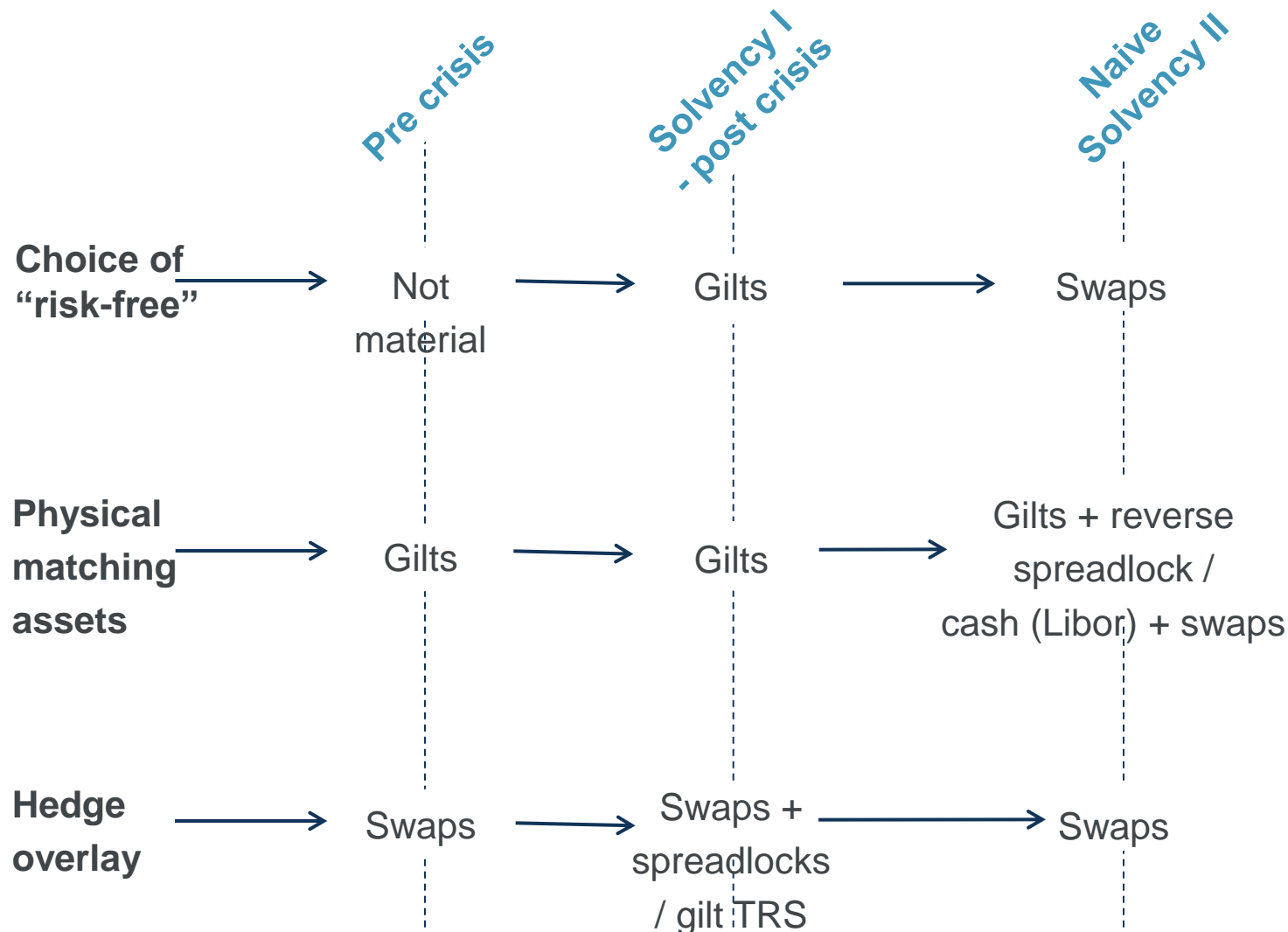
What we say to dogs and what they hear



What Solvency II says and what different people hear



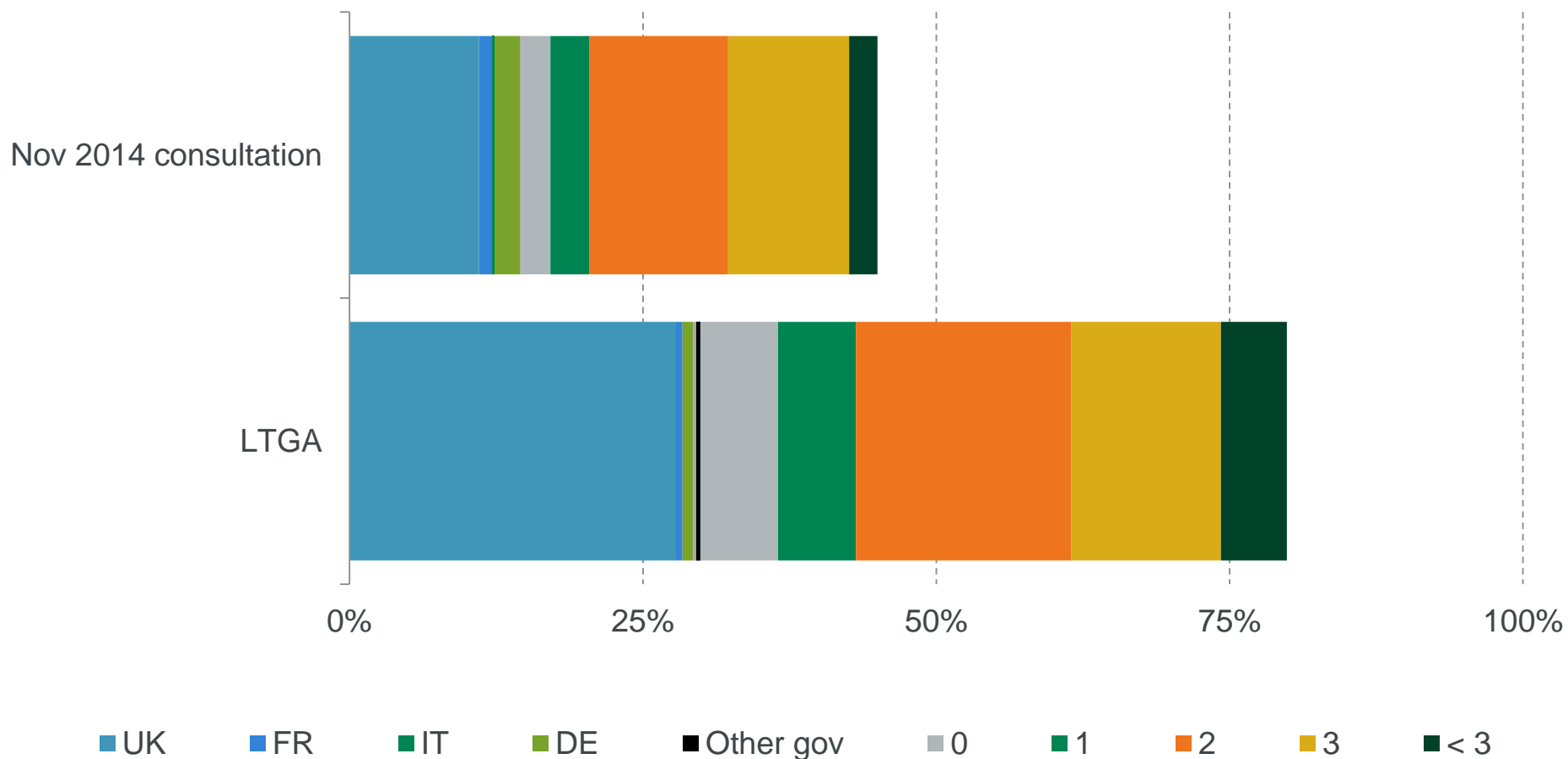
Evolution of “risk-free” hedging debate



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	x	Downgrade risk	x	• No basis risk
• No SCR offset	x	Expected defaults	x	• Reduced SCR
Investment implications		Risk-free rate		Investment implications
• Shorter-dated credit				• Long-dated closely-matched credit
• Long-dated “risk-free” overlays				

Volatility Adjustment – reference portfolios



Bit of obligatory maths

$$\Delta \text{ risk-free rate} = \Delta \text{ reference-rate} + \Delta \text{ credit risk-adjustment} + \Delta \text{ volatility adjustment}$$

$$\begin{aligned} \Delta \text{ risk-free rate} = & \Delta \text{ Libor swap rate} \\ & + \Delta \text{ credit risk-adjustment} \\ & + 65\% * w_{\text{govt}} * \Delta \text{ risk-corrected spreads on gilts} \\ & + 65\% * w_{\text{corp}} * \Delta \text{ risk-corrected spreads on corporates} \end{aligned}$$

The risk-correction is essentially fixed so:

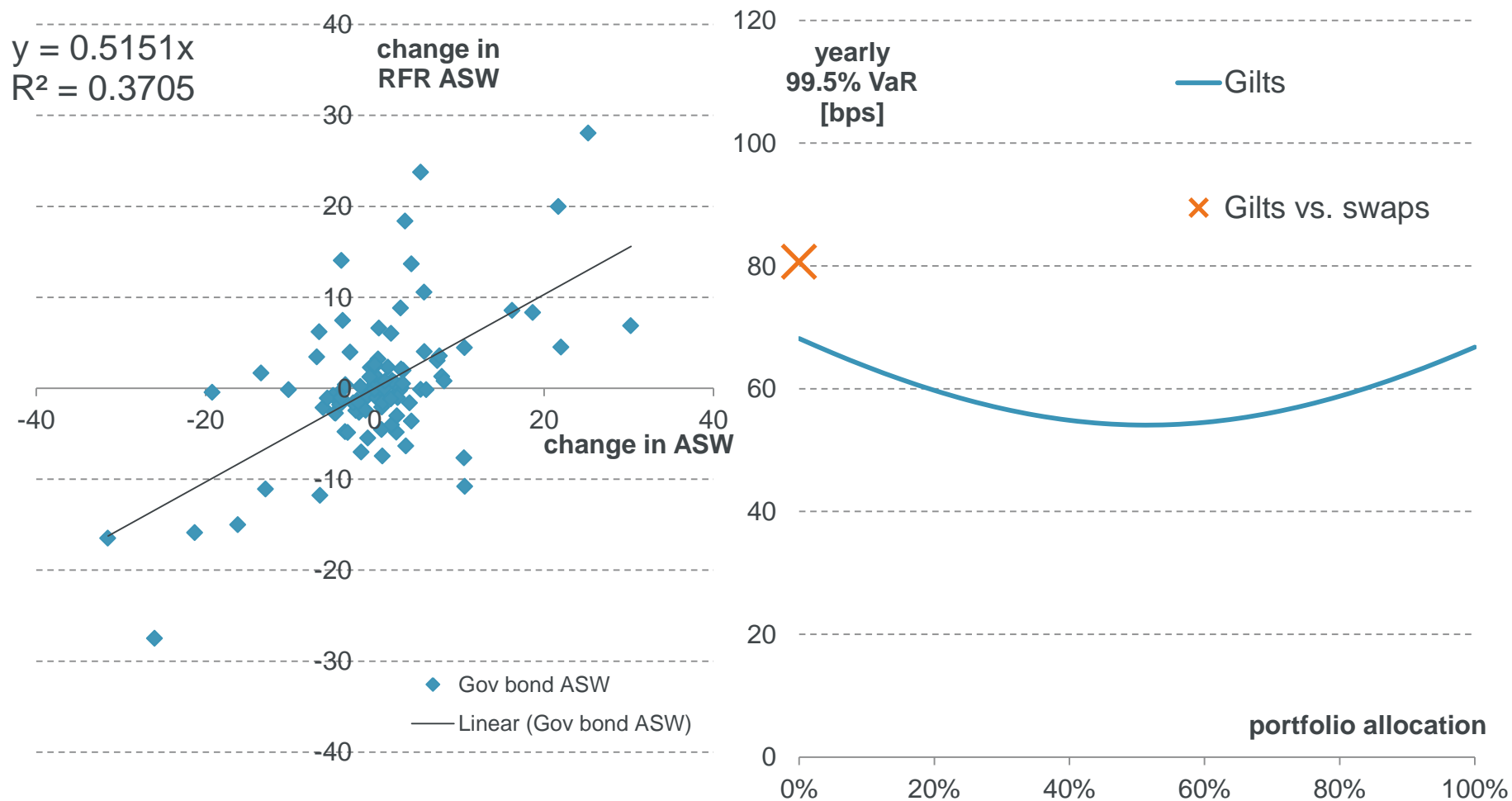
$$\begin{aligned} \Delta \text{ risk-free rate} = & (1 - 65\% * (w_{\text{corp}} + w_{\text{govt}})) * \Delta (\text{Libor swap rate} + \text{credit risk-adjustment}) \\ & + 65\% * w_{\text{govt}} * \Delta \text{ yields on gilts} \\ & + 65\% * w_{\text{corp}} * \Delta \text{ yields on corps} \end{aligned}$$

$$\Delta \text{ credit risk-adjustment} = 50\% * \Delta \text{ 1y average of Libor-Sonia, with a max variation of 25bps (35bps cap - 10bps floor)}$$

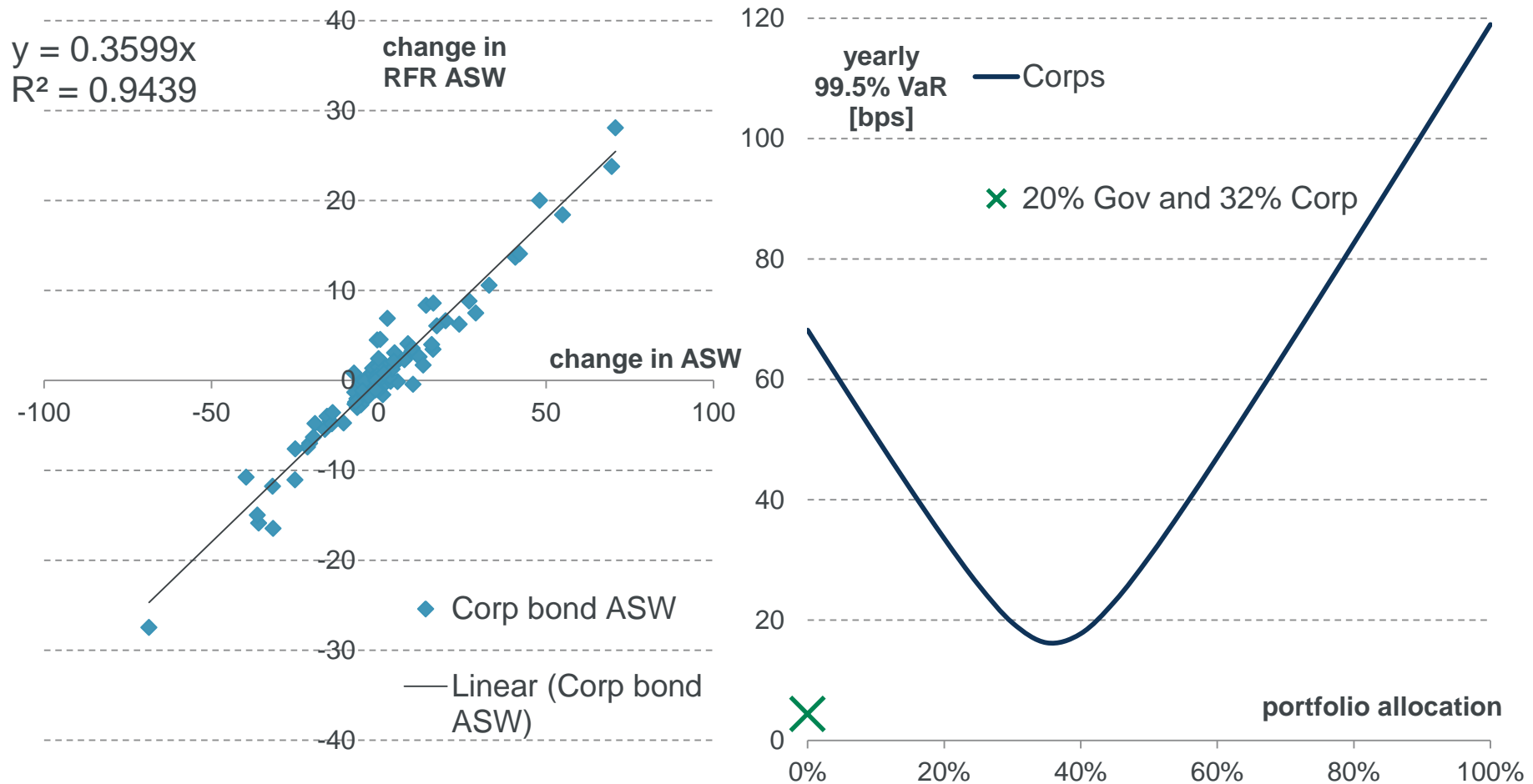
Using the weights for GBP in the LTGA, we find

$$\begin{aligned} \Delta \text{ risk-free rate} = & 47.6\% * \Delta \text{ Libor swap rate} \\ & + 19.8\% * \Delta \text{ gilt yield} \\ & + 32.6\% * \Delta \text{ corporate yields} \\ & + 23.8\% * \Delta \text{ 1y average of Libor-Sonia (max variation 12bps)} \end{aligned}$$

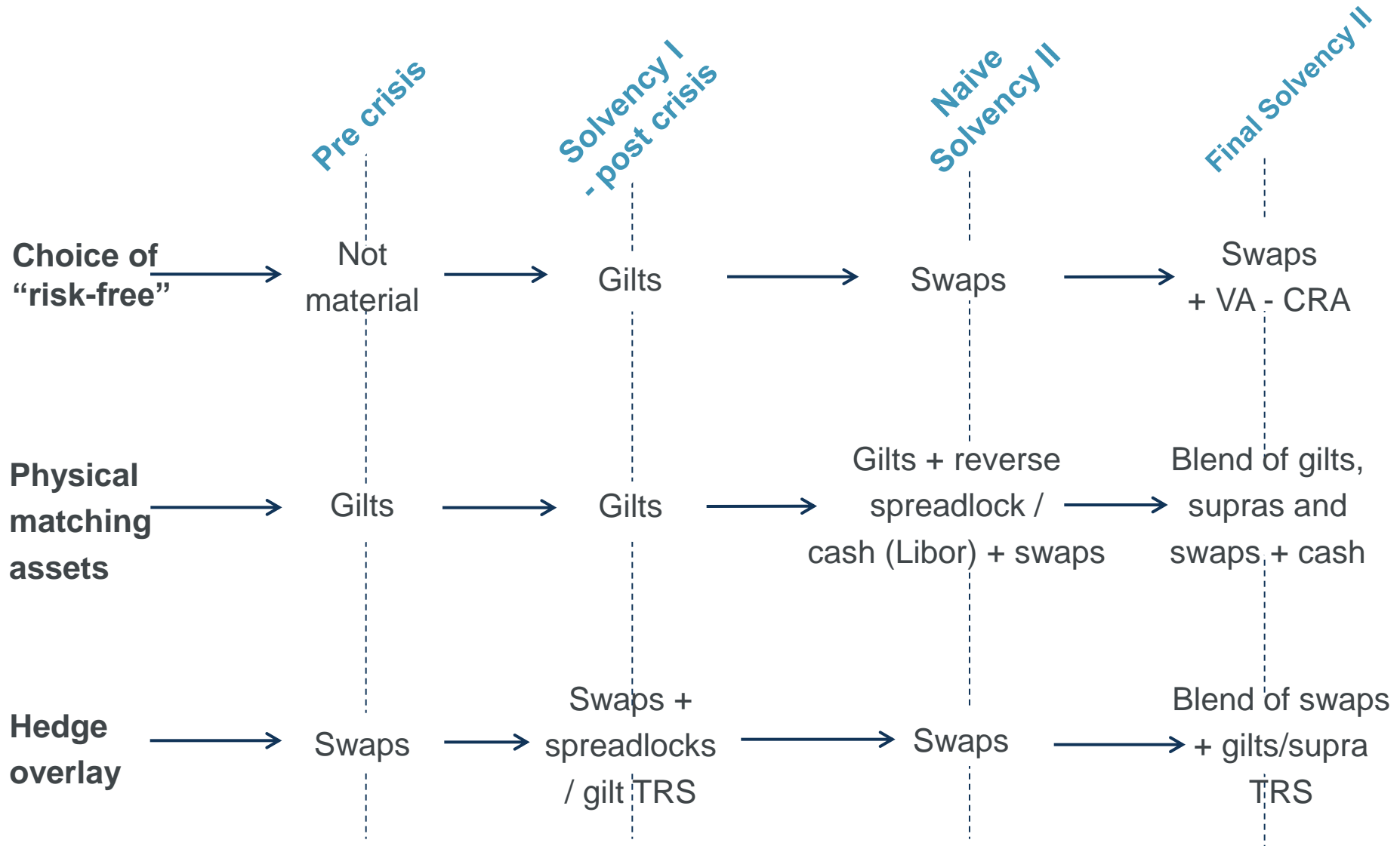
Hedging with just gilts or swaps



Adding corporate bonds into the mix



Evolution of “risk-free” hedging debate



The thorny issue of approval



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.