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LIABILITY

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Solvency II and the CRO Forum



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CORINTHIA TOWERS HOTEL
PRAGUE, CZECH REPUBLIC
APRIL 23-27, 2007

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Evolution of European Insurance Solvency

□ Solvency I (actual)

- Rule-based
- Capital based on ratios of premiums, liabilities
- Underlying liability valuation not consistent between member states, but usually contains margins for prudence
- Some EU member states have added additional tests

□ Solvency II (aspirational)

- Principle based
- Capital requirements based on probability models of risk. All margins for prudence held as capital, not liabilities.
- Prescribed liability valuation methodology including market consistent liability and a margin for cost of capital
- Comprehensive, avoids the need for member states to impose additional rules.

Upcoming Events

Quantitative Impact Studies (QIS)

QIS 3: April 2007

QIS 4?

QIS 5?

EU Directives

Draft directive: October 2007

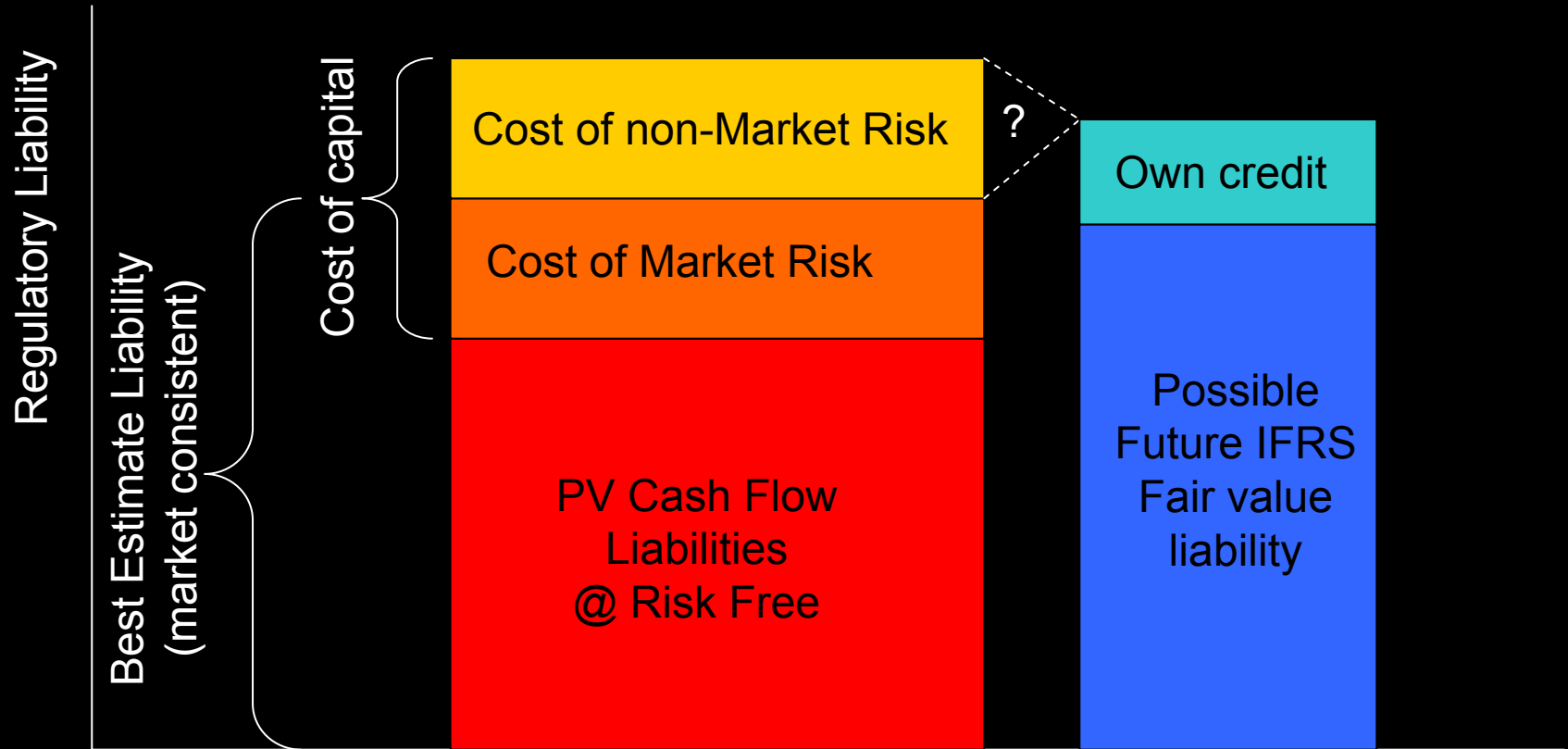
Framework directive: July 2008

National adoption: ? 2010

This talk assumes QIS 3 is a likely basis for the framework directive.

Solvency II Liability

– Another Claim to Fair Value

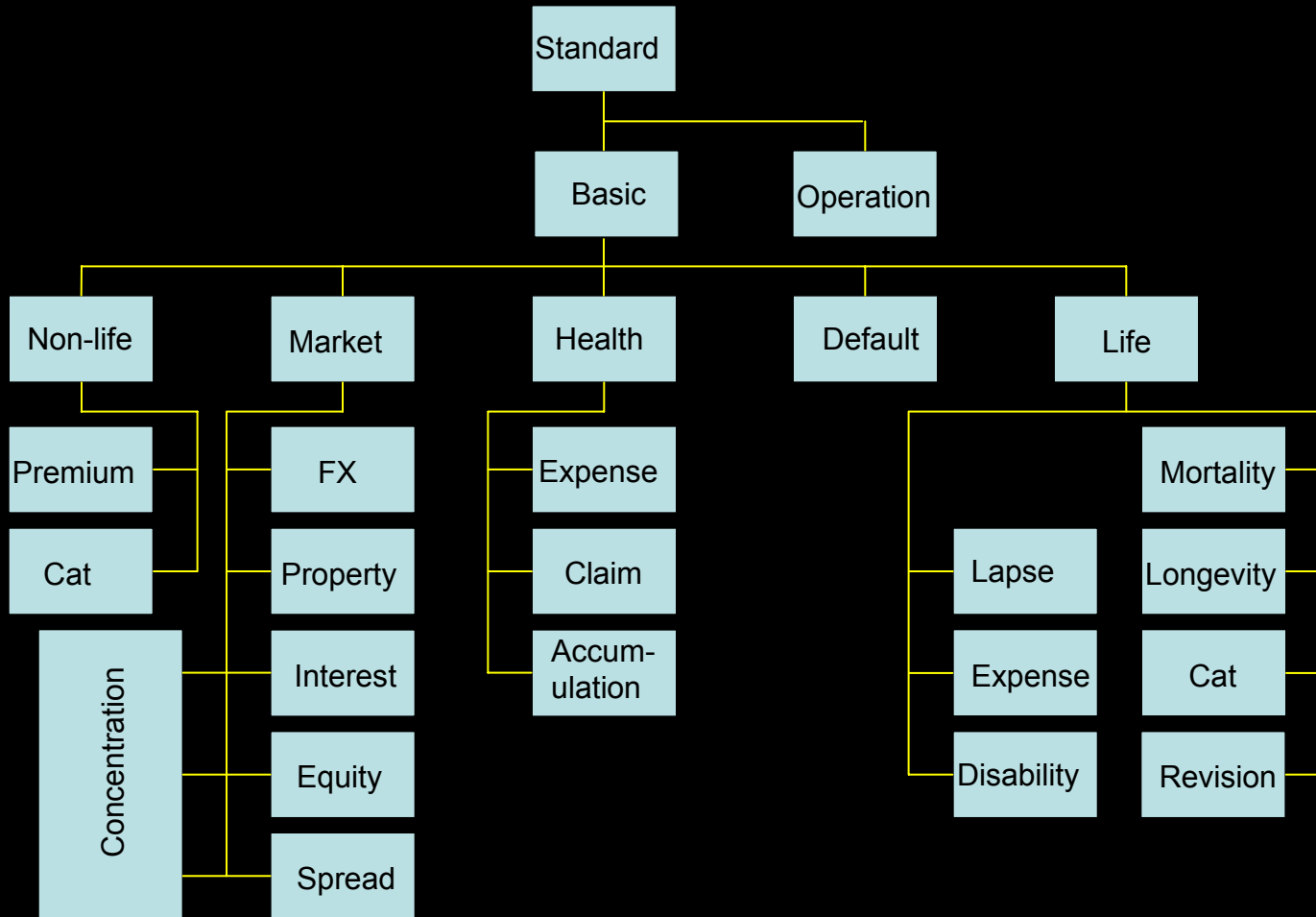


Firms may require significant systems investment to perform these calculations. The original intent was to borrow insurance IFRS work, but the IASB is now likely to be too late for this – unless Solvency II is delayed also.

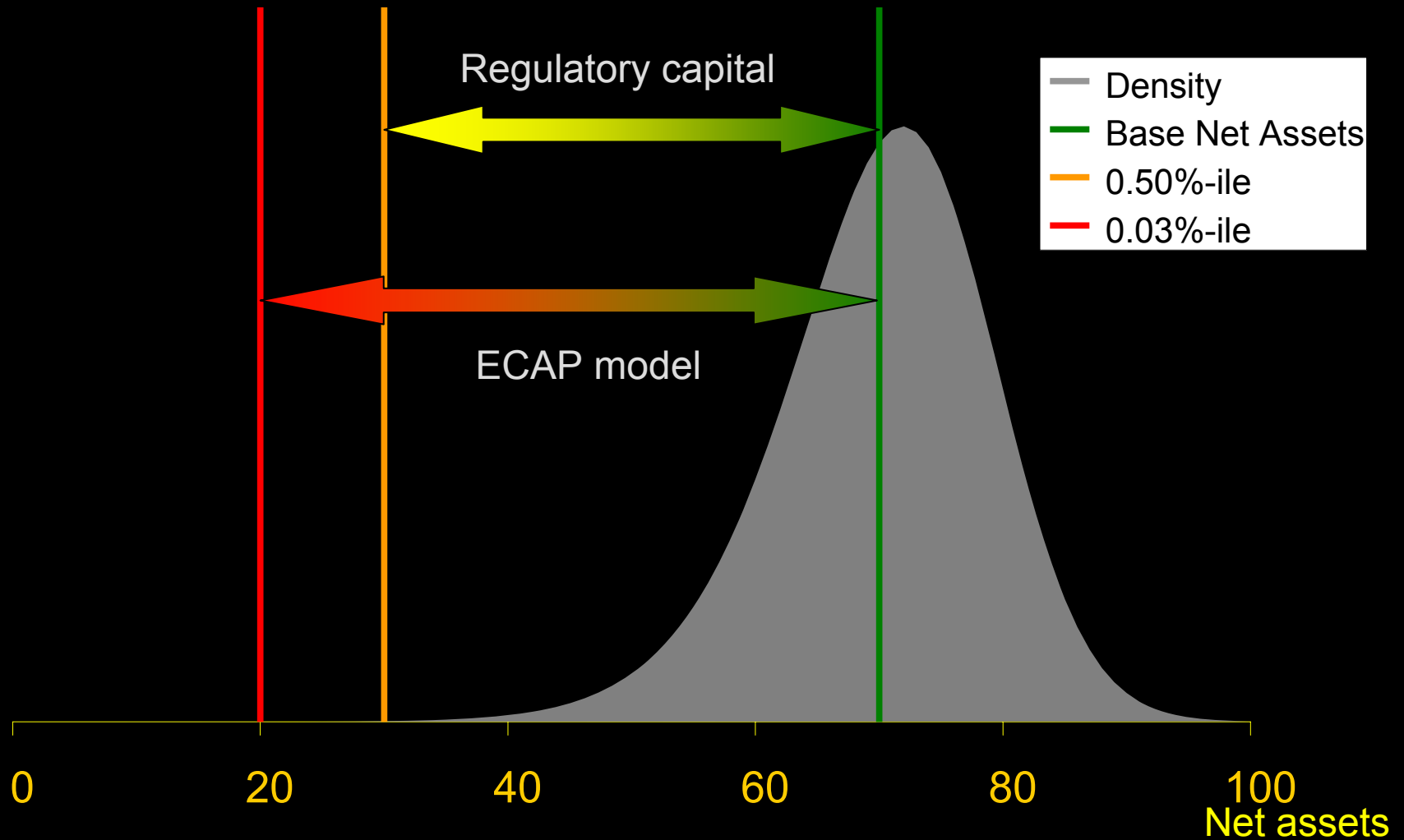
Net Assets Function

- $\text{Net Assets} = \text{Market Assets} - \text{Regulatory Liability}$
- Firms must calculate
 - Current net assets
 - Hypothetical net assets under a number of specified stress tests
 - Effect of stress tests applied to assets and liabilities simultaneously
 - Including consequent effects on future profit sharing, on prices of derivative positions
- For regulatory purposes, a firm is characterised by its net assets function
 - Two firms with the same net assets function enjoy the same regulatory treatment, irrespective of the legal form of the assets and liabilities
 - This should imply consistent treatment whether risk-sharing is structured using reinsurance, derivatives securitisation or ...
- Capital required for each risk defined as
 - Current net assets
 - Minus net assets under the stress test
 - With a minimum of zero (no credit for beneficial stresses)

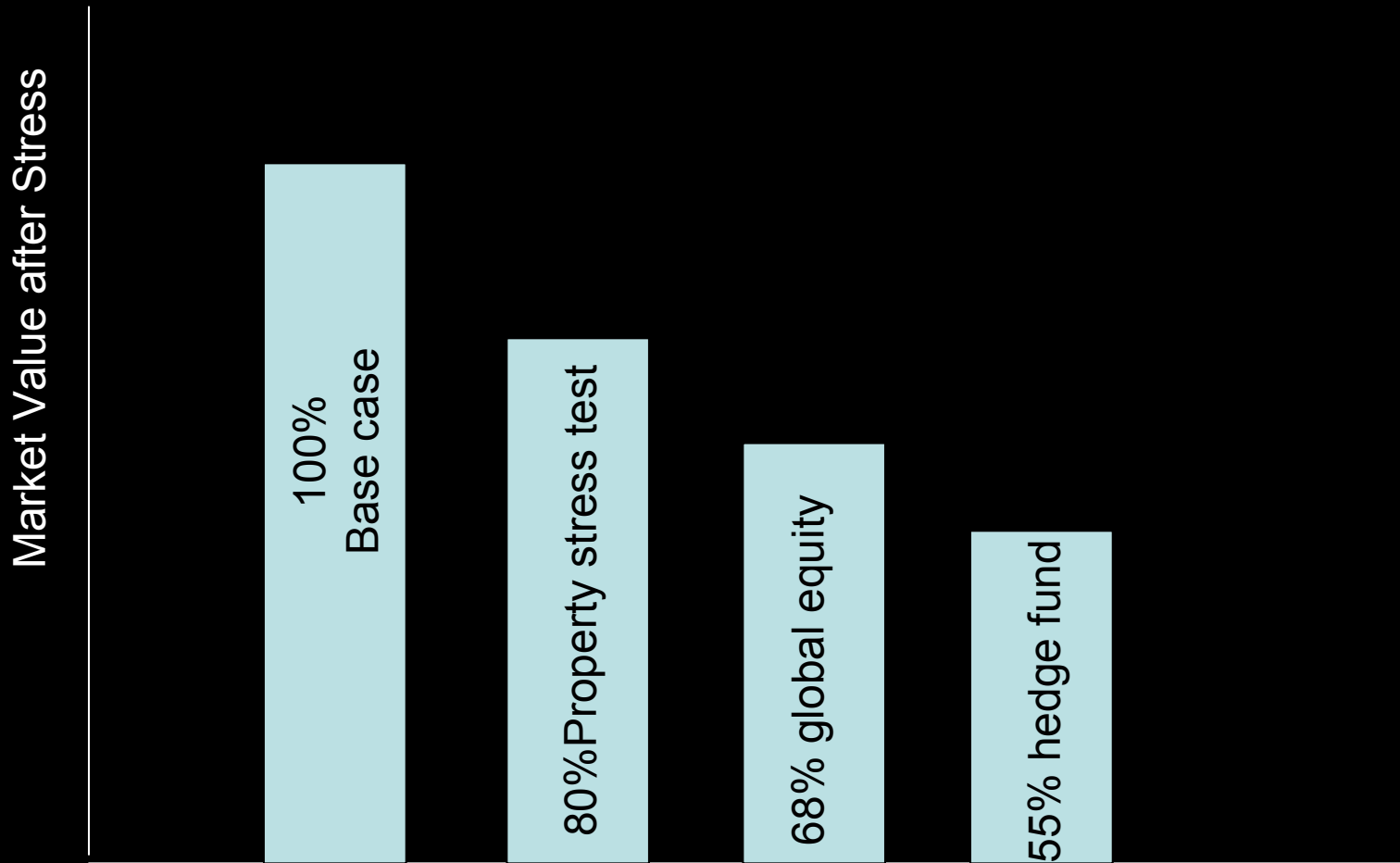
Risk Capital Calculation: QIS 3



The Percentile Approach to Capital

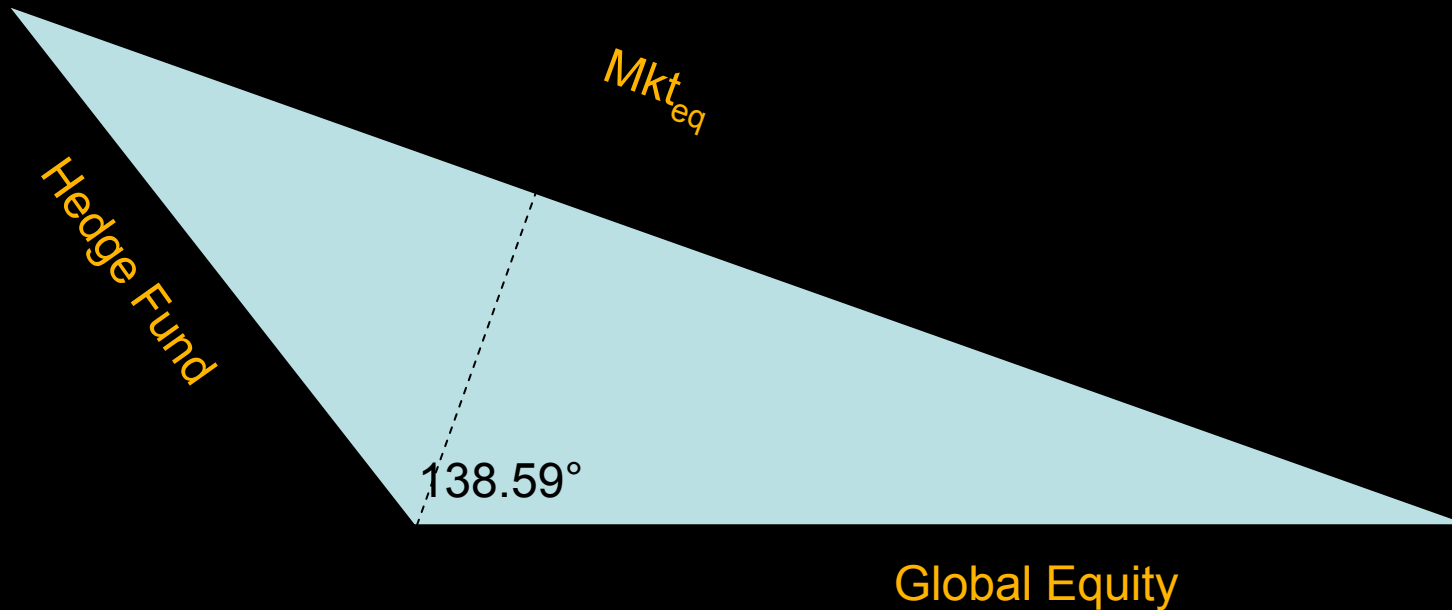


Risk Stress Tests for Variable Income (QIS 3) under standard capital model

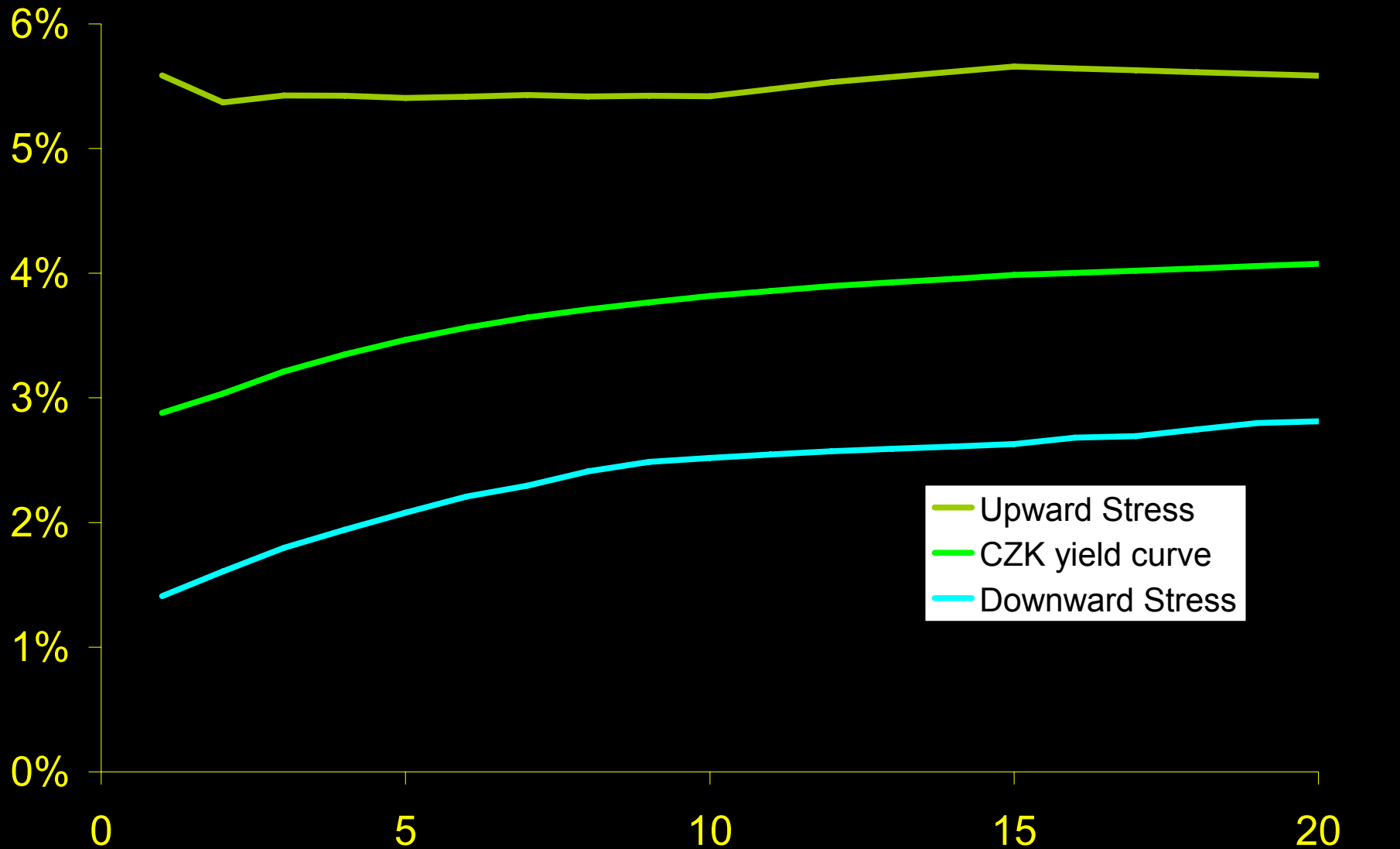


Combining Stress Tests

$$Mkt_{eq}^2 = Mkt_{global\ eq}^2 + Mkt_{hedge\ fund}^2 + 2\rho Mkt_{global\ eq}Mkt_{hedge\ fund}$$
$$\rho = 0.75 = -\text{Cos}(138.59^\circ)$$



Interest Capital uses Worst of Two Stresses



Aggregating Multiple Risks: Correlation Approach

	Mkt _{interest}	Mkt _{equity}	Mkt _{property}	Mkt _{spread}	Mkt _{fx}
Mkt _{interest}	1	0	0.5	0.25	0.25
Mkt _{equity}	0	1	0.75	0.25	0.25
Mkt _{property}	0.5	0.75	1	0.25	0.25
Mkt _{spread}	0.25	0.25	0.25	1	0.25
Mkt _{spread}	0.25	0.25	0.25	0.25	1

Example capital calculation for two risks:

$$\text{Mkt}_{\text{interest}} = 5$$

$$\text{Mkt}_{\text{property}} = 3$$

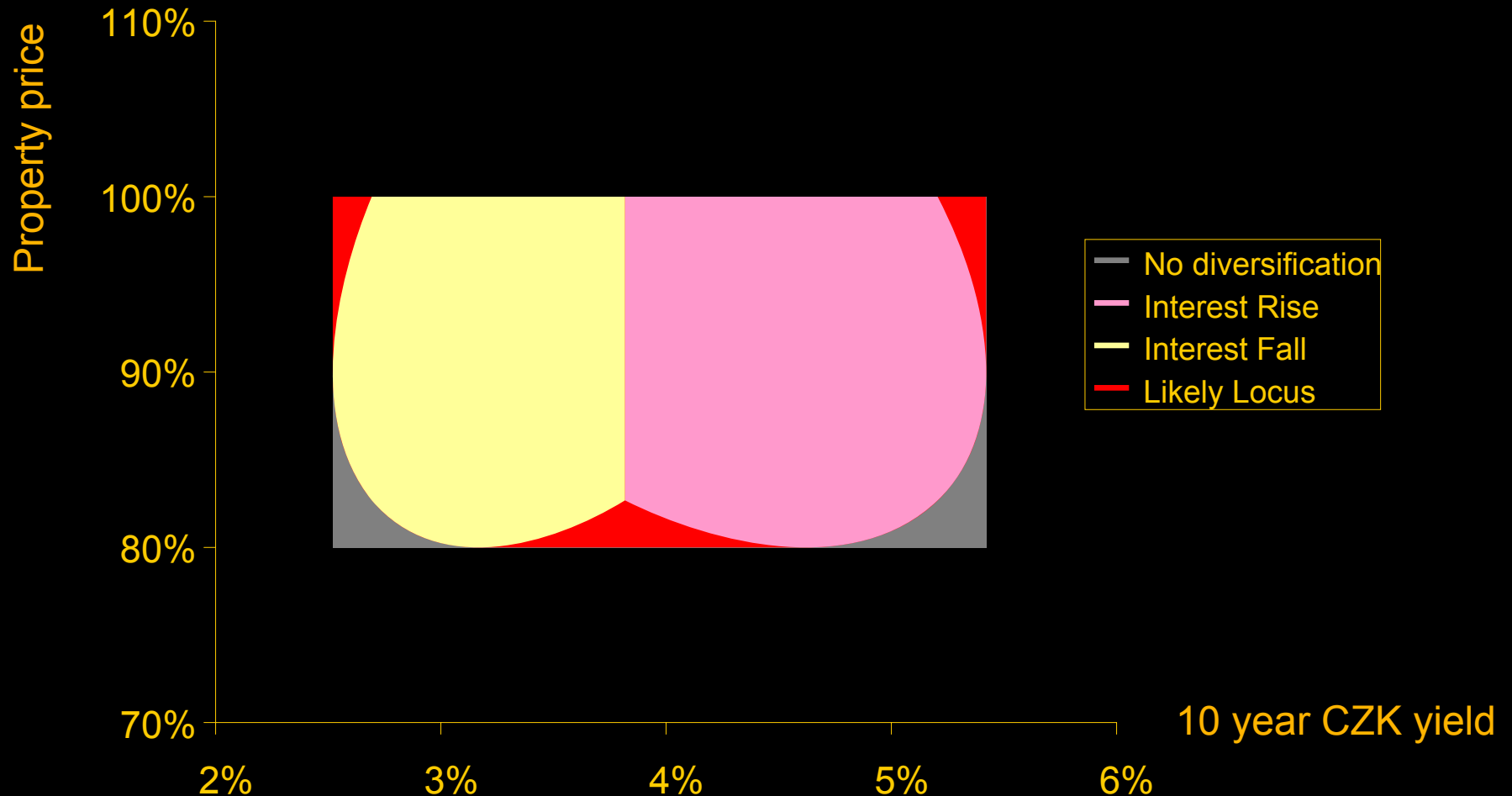
$$\text{SCR}_{\text{Mkt}}^2 = 5^2 + 3^2 + 2 \times 0.5 \times 5 \times 3 = 49$$

$$\text{So } \text{SCR}_{\text{Mkt}} = 7$$

Compare $8 = \text{Mkt}_{\text{interest}} + \text{Mkt}_{\text{property}}$ under Solvency I

Solvency II diversification benefit = 1

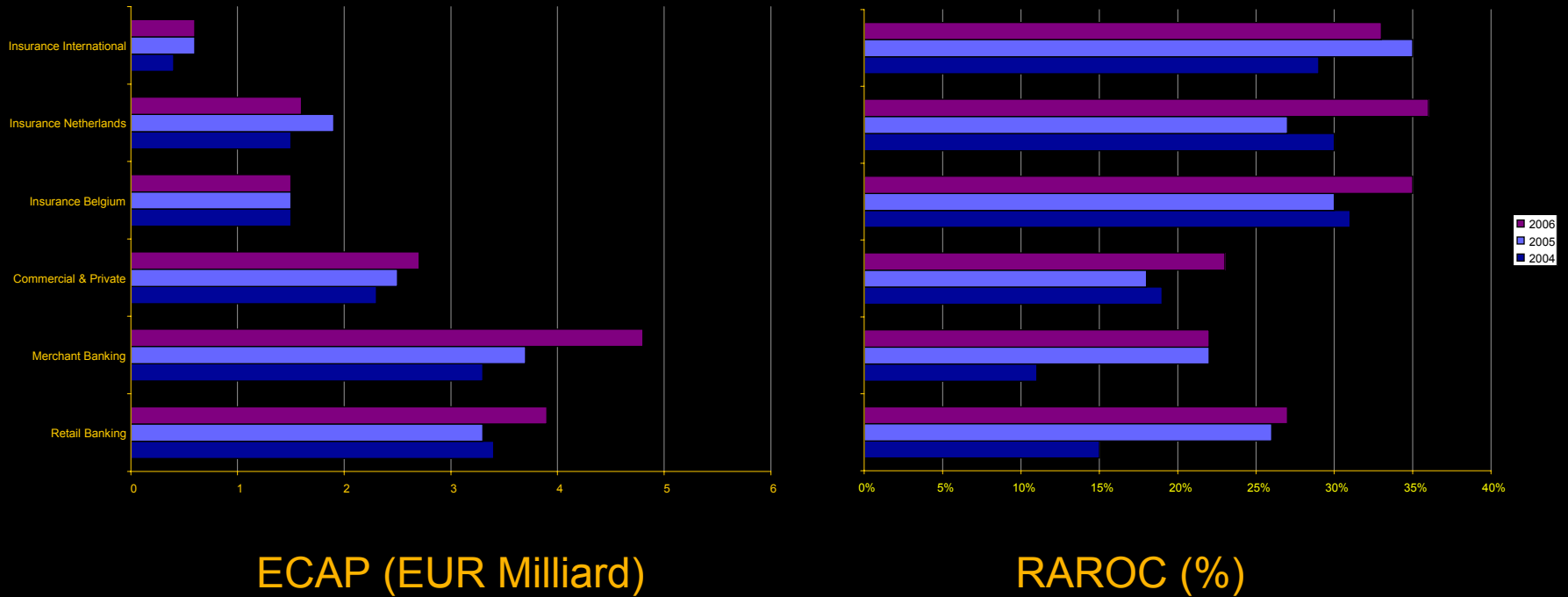
The Aggregation Approach is Equivalent to Positive Net Assets on the Likely Locus



How to Present a Model for Approval

- ❑ Firms have an option to use their internal model
 - In place of the standard capital requirement
 - Subject to the “in use” test
 - And other regulatory approval
- ❑ Regulators are not experts in 1-in-200 events, have no unique data or proprietary knowledge
 - But they can see many firms
 - Need to be consistent between firms
 - This has led (in UK) to secret regulatory benchmarks of acceptable assumptions
 - Regulators’ mistrust of each other is likely to force these benchmarks into the open under Solvency II
- ❑ Firms are unlikely to persuade regulators of less stringent tests for market risk under their own models
 - Focus is on aspects special to a firm’s business
- ❑ Regulatory Dialog may require line-by-line assumption benchmarking against the standard approach
 - Incentivizes firms to adopt an SCR template for internal model, based on stress tests
 - Limited scope for complex models that produce “the answer” in unconventional ways

Return on Risk Adjusted Capital

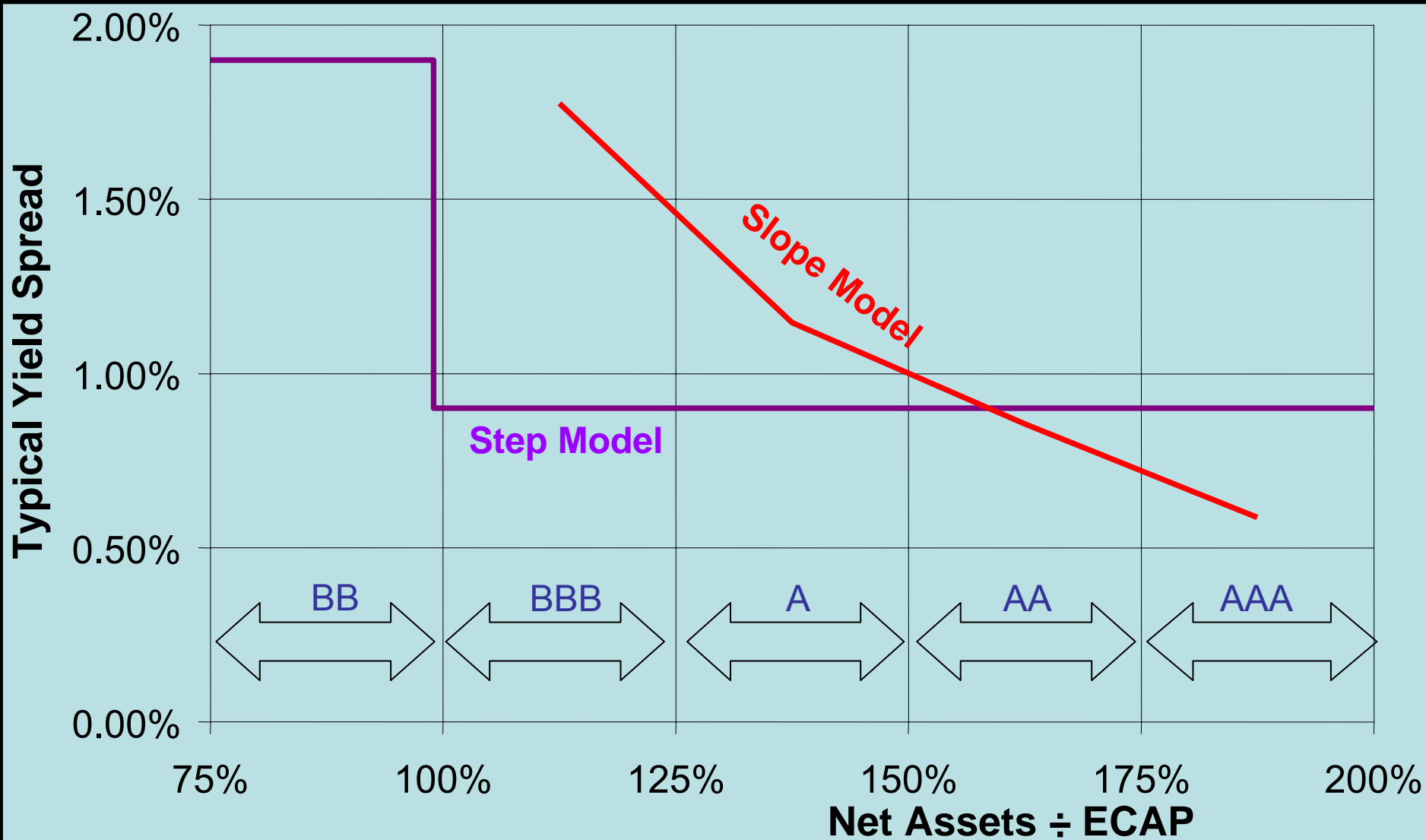


Fortis: Economic Capital at 0.3%-ile, and RAROC, 2004-2006

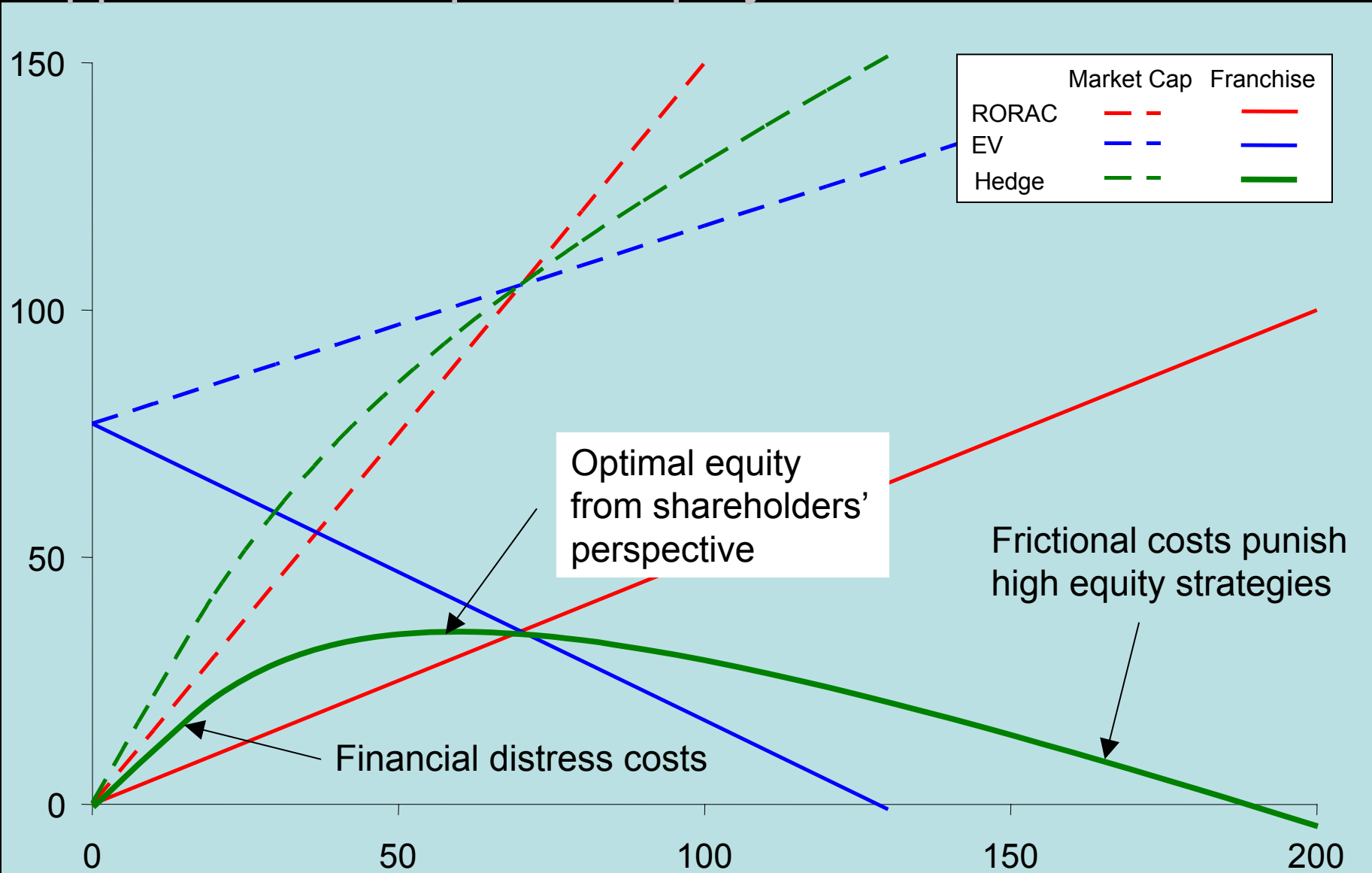
Value-focused Approach to Capital contrasts with current ECAP Models

	P – Approach	Q – Approach
Objective	Maximise RAROC Subject to risk appetite	Maximise market value Allowing for risk costs
Calibration	Statistical behaviour of historic time series	Current market prices
Pricing	Discounting expected cash flow values	Replicating portfolios Risk premiums irrelevant
Validation	Long data time series	Hedge effectiveness

Net Assets and Yield Spread



Approaches to Optimal Equity



Business Implications

- ❑ Solvency II more closely aligns capital with risks borne
 - Provides new risk constraints on capital
 - While easing some previous constraints
- ❑ A shareholder perspective is value based, and is never fully aligned with a regulatory regime designed to protect policyholders.
- ❑ Leaders already have internal capital models, controls and communications with the market
- ❑ Close relations with regulators are more important than ever.

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