



*somewhat
different*

Financial Solutions

Opportunities and Challenges under the New Solvency Regime

Peter Xiong, Hannover Re Hong Kong

- ❖ General Introduction
- ❖ How new solvency regime has affected Insurers
- ❖ Reinsurance solutions under SII/RBCII
- ❖ Conclusion

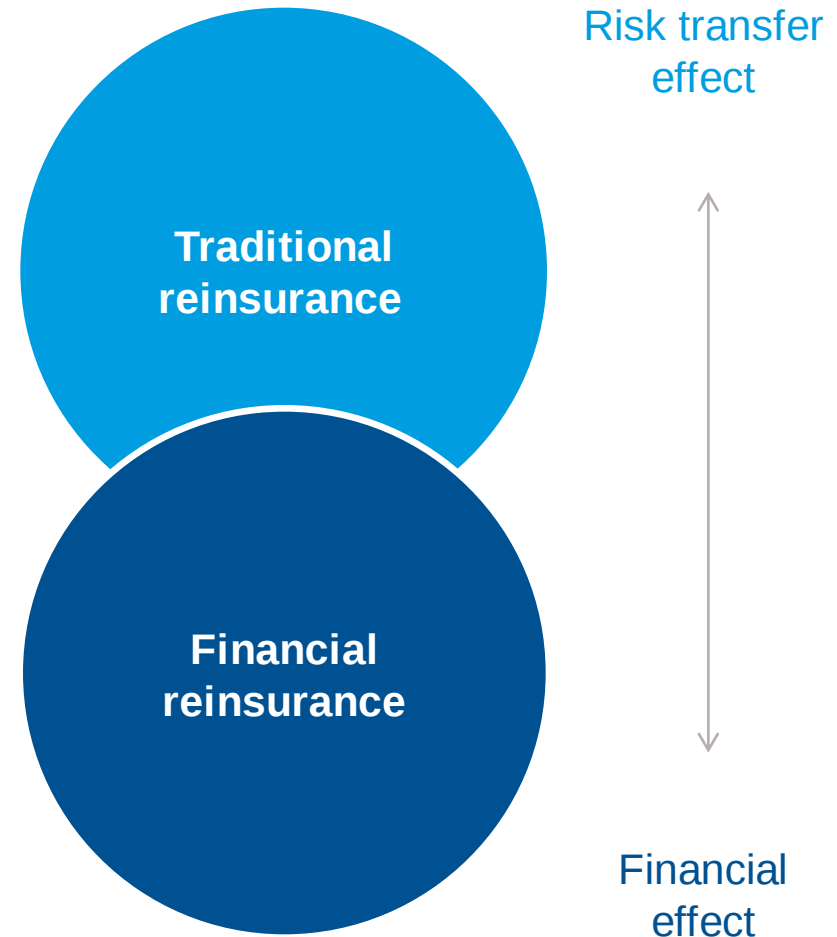
Financial Solutions

General development over time

Financial solutions: reinsurance transactions ...

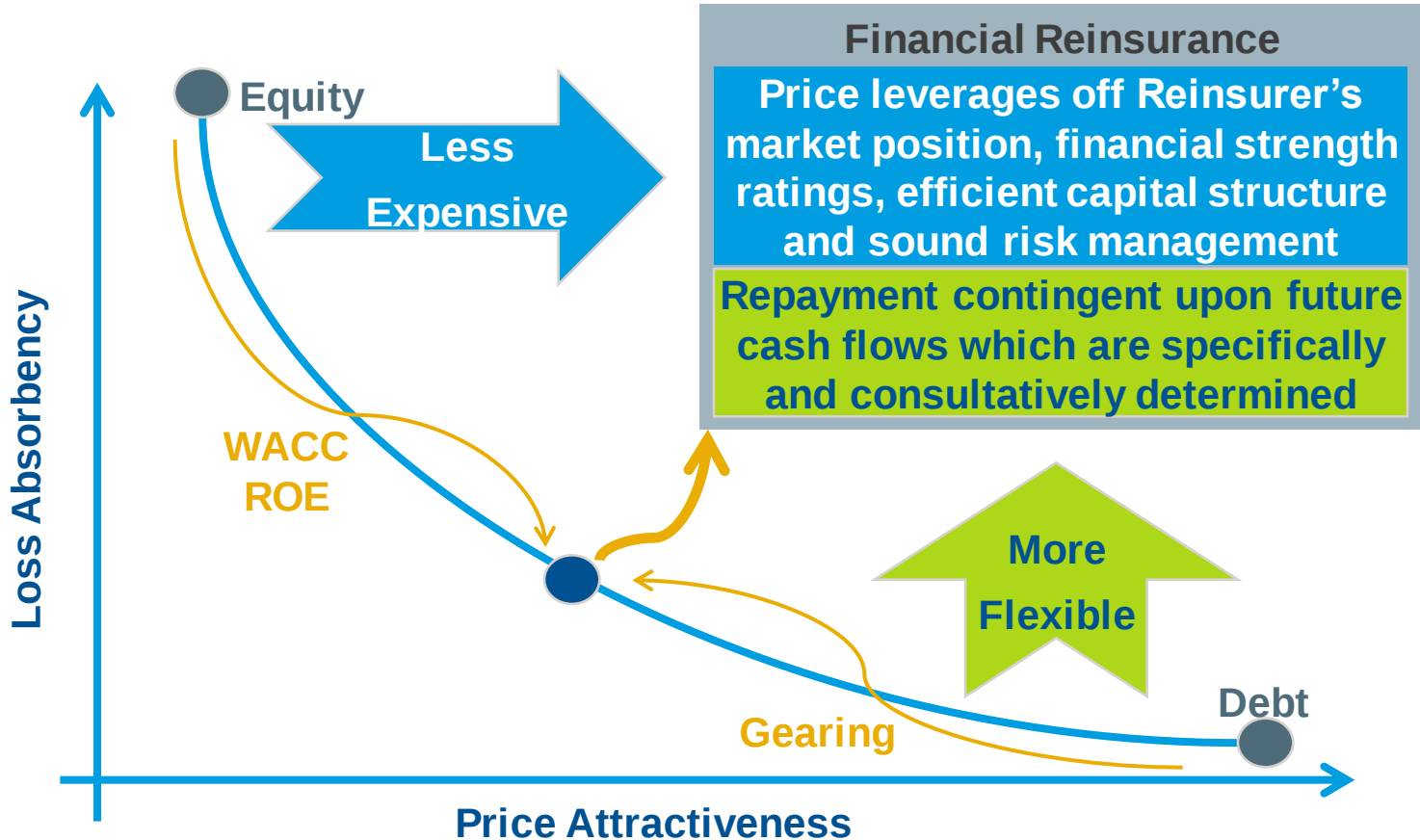
...with a specific financial objection

- ▶ Financial and traditional reinsurance
 - Achieving risk transfer and financial objectives
- ▶ Traditional reinsurance
 - Transferring insurance risk to reduce the risk and volatility in the ceding company's results
- ▶ Financial reinsurance
 - Structured reinsurance agreement going beyond risk management and aiming to achieve one or more specific financial objectives for the ceding company



Financial solutions

An alternative means to access capital ...



The flexible source of capital and funding

Alternative capital sources

Financial solution repayments are subject to business performance

Financial reinsurance



What sets reinsurance apart:

- + Covers losses above capital provided
- + Reduces risk-based capital
- + Rapid implementation
- + Low transaction cost
- + Low minimum size

Debt

Hybrid capital

Equity

Securitisation

Financial Reinsurance

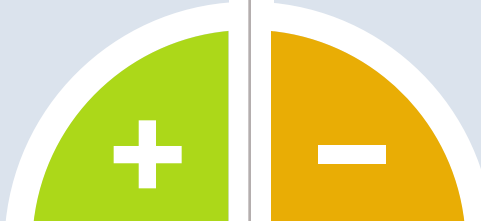
What it Can and Can't do

Can do:

- ▶ Alleviate new business strain
- ▶ Relieve redundant reserves
- ▶ Smooth volatile results
- ▶ Follow accounting best practices

Can't do:

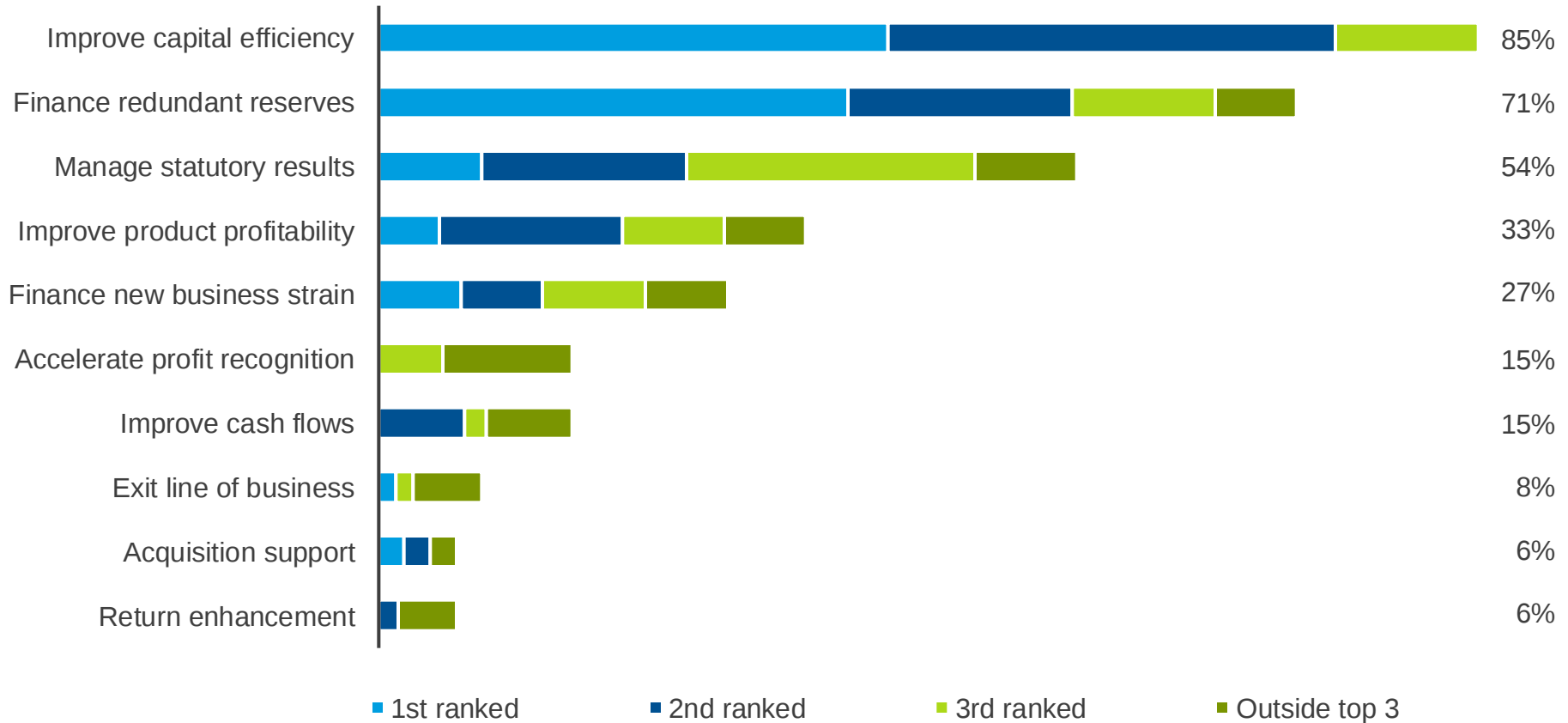
- ▶ Absorb loss making business
- ▶ Reduce economic reserves
- ▶ Correct structural losses
- ▶ Artificially creative window dressing



Main motivation: improvement of capital efficiency

Structured financial solution usage USA

All respondents



Source: NMG survey

Only factors cited by more than one key decision maker are shown

One important distinction: cash vs. non-cash

Depending on the client's objectives and required liquidity



Cash financing

- ▶ Transaction starts with one or more cash payments from reinsurer to ceding company
- ▶ Initial amount is recuperated in the following years (incl. reinsurer's expected margin) or not if profits are not high enough due to higher claims or lapses than anticipated



Non-cash financing

- ▶ Transaction just starts with an initial claim against the reinsurer
- ▶ Claim reduces over time if and when profits emerge: outstanding amount (if any) at the end of the agreed treaty term will be settled in cash

Some typical financial solutions under Solvency I

Coinsurance – Fund withheld

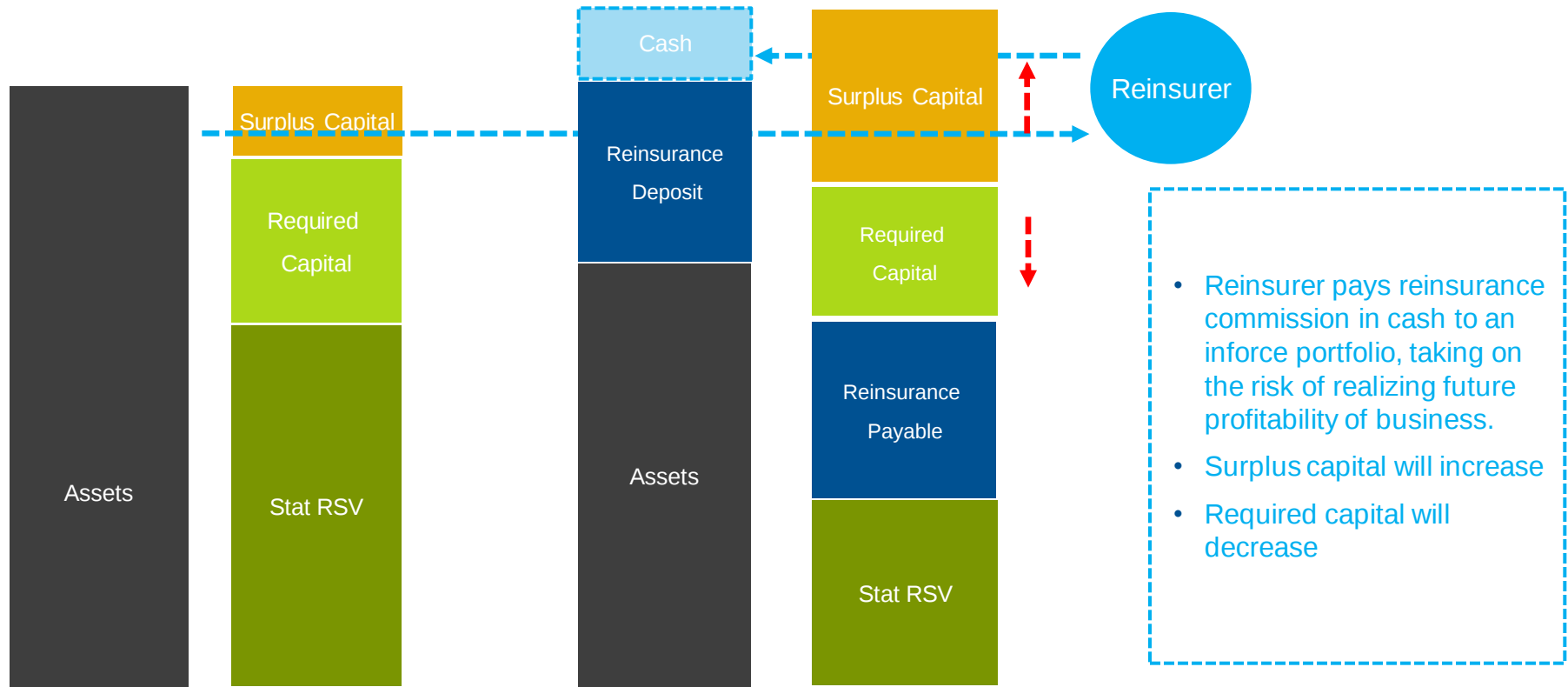
- ▶ Coinsurance but assets will be deposited back to the Cedant
- ▶ Could be cash or non-cash or both
- ▶ Can be used for:
 - NB financing
 - Solvency relief
 - VIF monetisation

Some typical financial solutions under Solvency I

Coinsurance – Fund withheld: Cash Deal

B/S before Reinsurance

B/S after Reinsurance



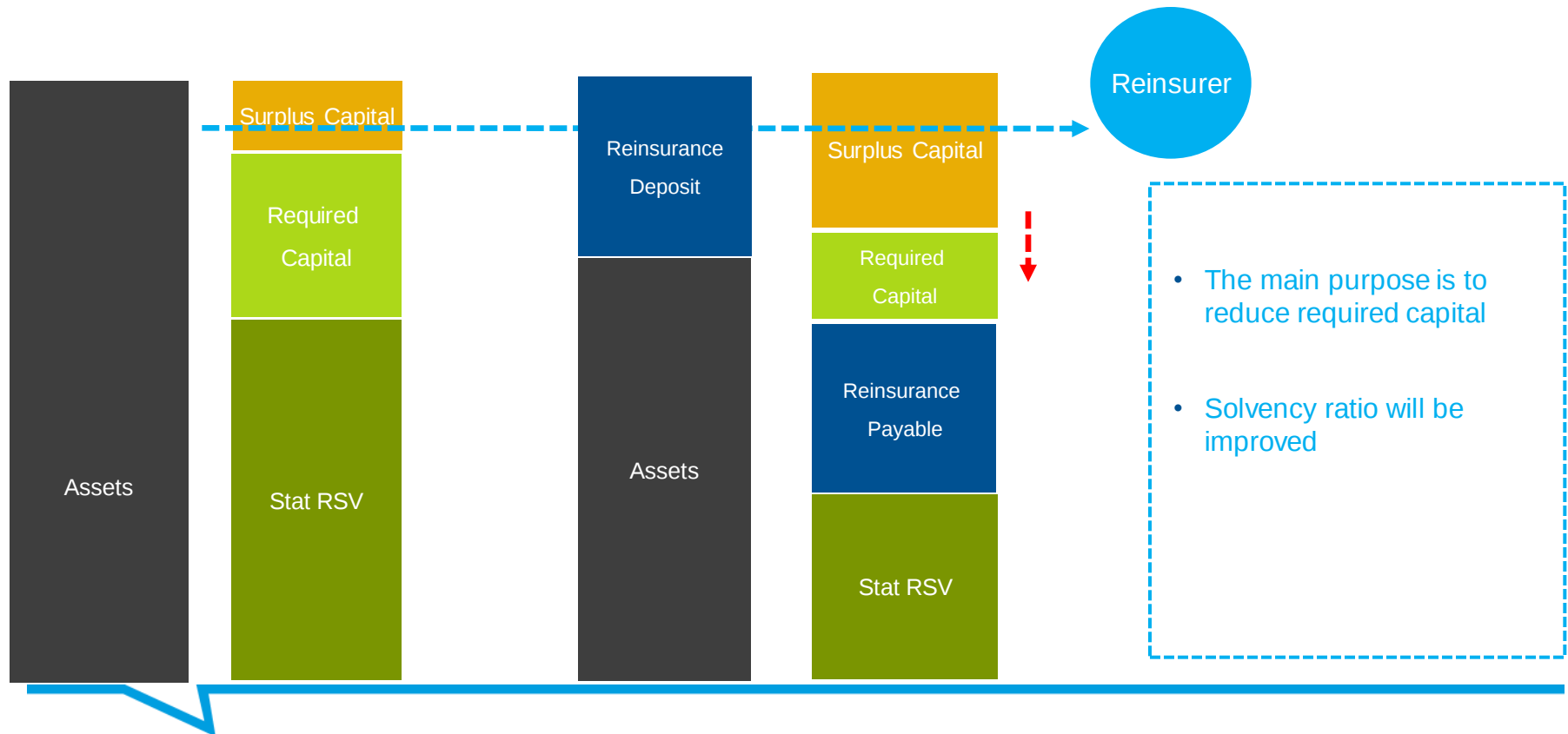
Cash is king!

Some typical financial solutions under Solvency I

Coinsurance – Fund withheld: Non-Cash Deal

B/S before Reinsurance

B/S after Reinsurance



An easy way to improve solvency position

Some typical financial solutions under Solvency I

Redundant reserve relief

Stat RSV = PV(future liabilities) – PV(future net premiums), where

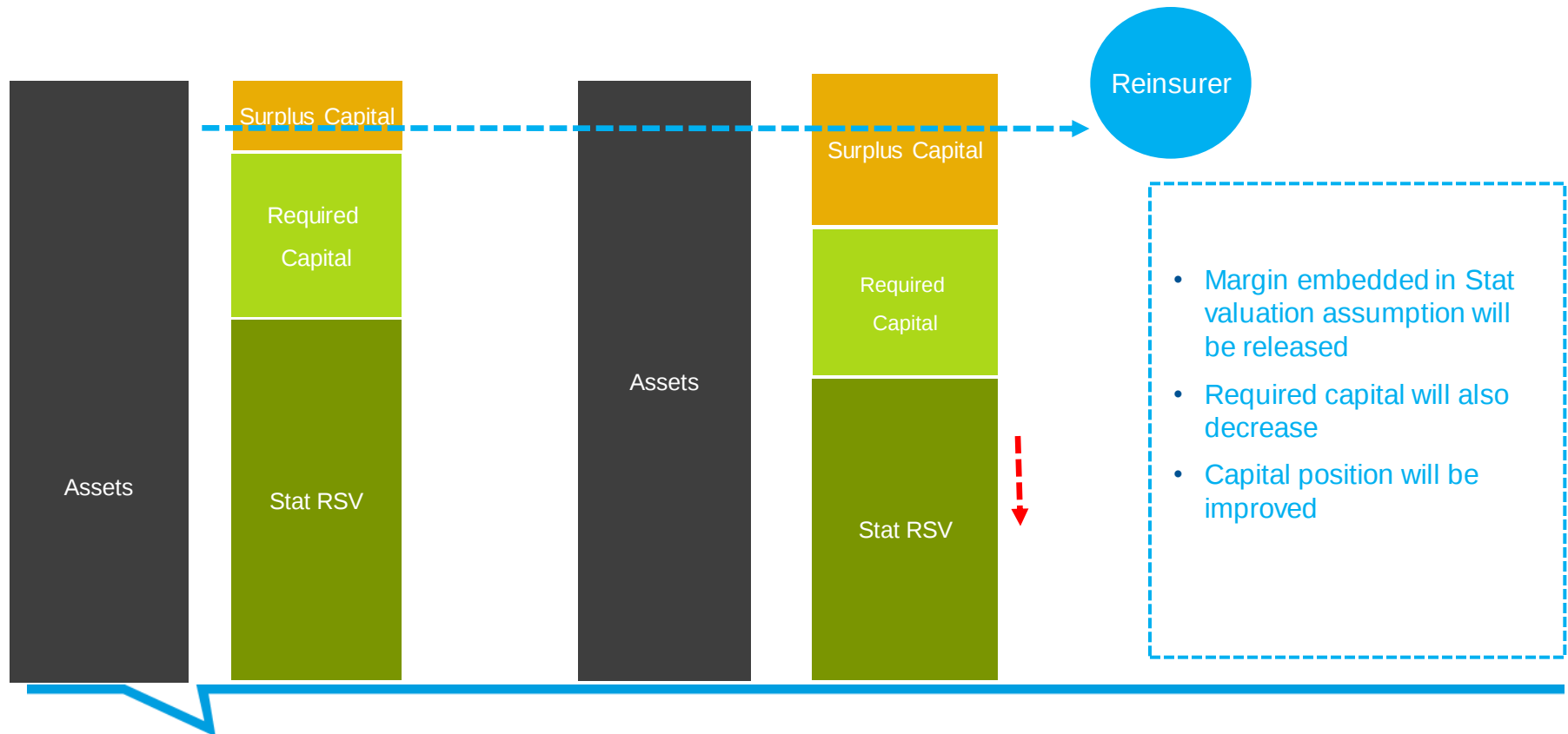
- ✓ Based on statutory assumptions
- ✓ No lapse assumption allowed
- ▶ It looks like a YRT reinsurance
- ▶ YRT reinsurance rates embedded with guaranteed lapse assumptions
 - $RI\ Rate = YRT\ Rate * Min(1, actual\ inforce\ policies / expected\ inforce\ policies)$*
- ▶ If the actual lapses are equal to or higher than the expected lapses, Reinsurer will receive the same YRT reinsurance premium
- ▶ If the actual lapses are lower than the expected lapses, Reinsurer will receive less reinsurance premiums
- ▶ The purpose is to release the conservative margin embedded in the valuation assumptions

Some typical financial solutions under Solvency I

Redundant reserve relief

B/S before Reinsurance

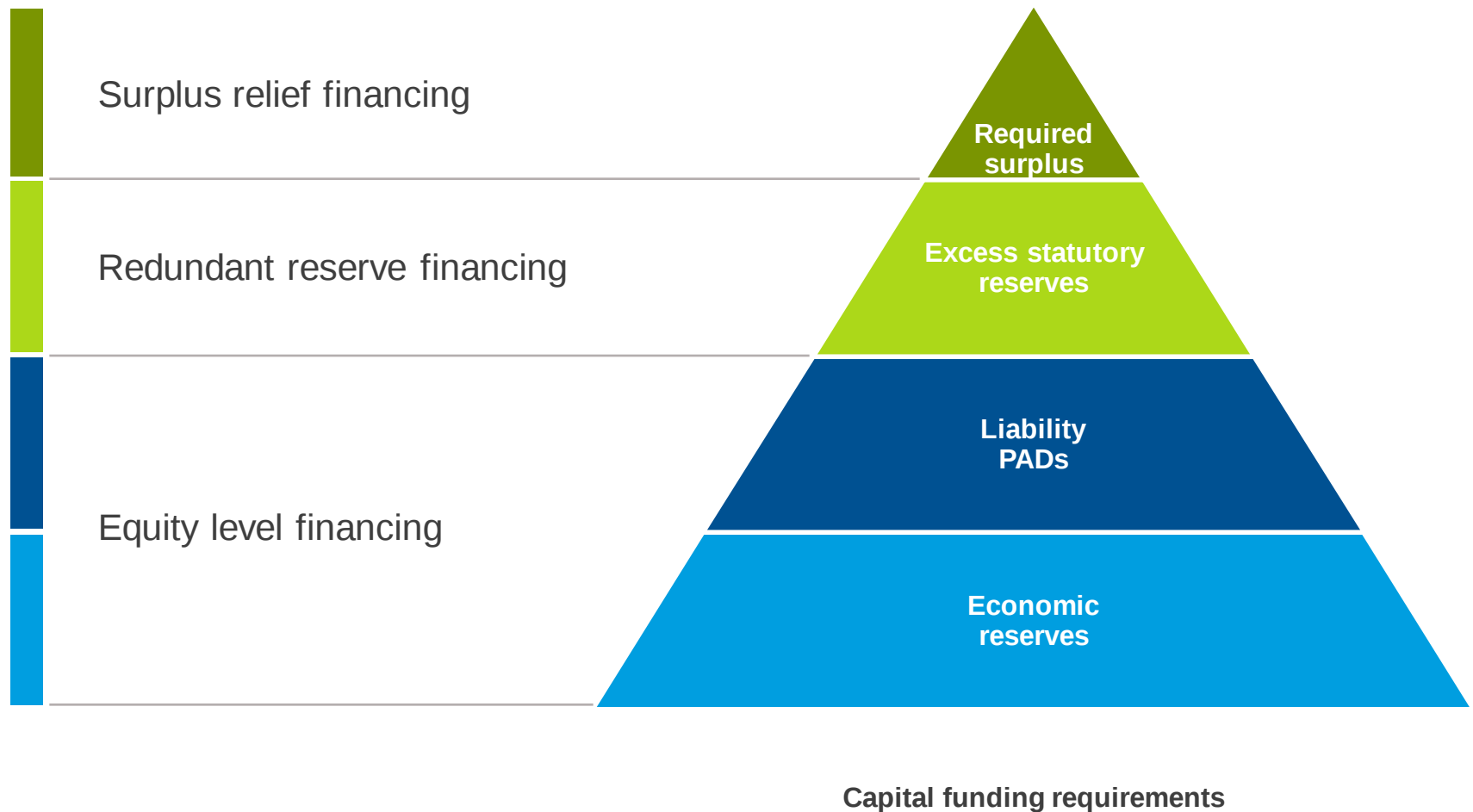
B/S after Reinsurance



Reinsurer will take biometric risks and lapse risk

Capital funding has varying costs

Asset subordination view

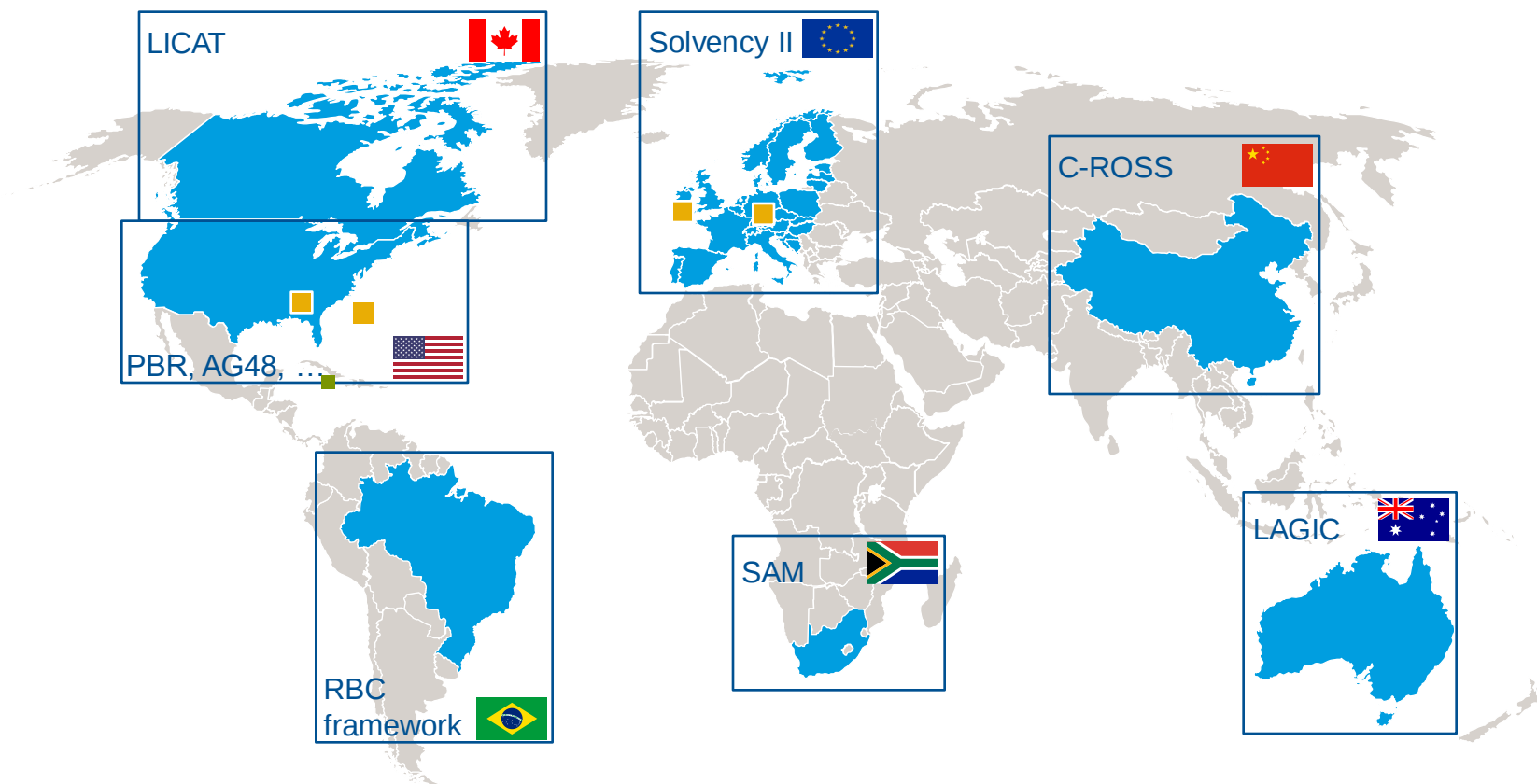


How new solvency regime has affected Insurers

----- Main insights from Europe's SII implementation

Business opportunities in a dynamic global environment

Our clients benefit from our deep knowledge of local markets and regulations



AG: Actuarial Guideline

C-ROSS: China Risk Oriented Solvency System

LAGIC: Life & General Insurance Capital Standards

LICAT: The Life Insurance Capital Adequacy Test

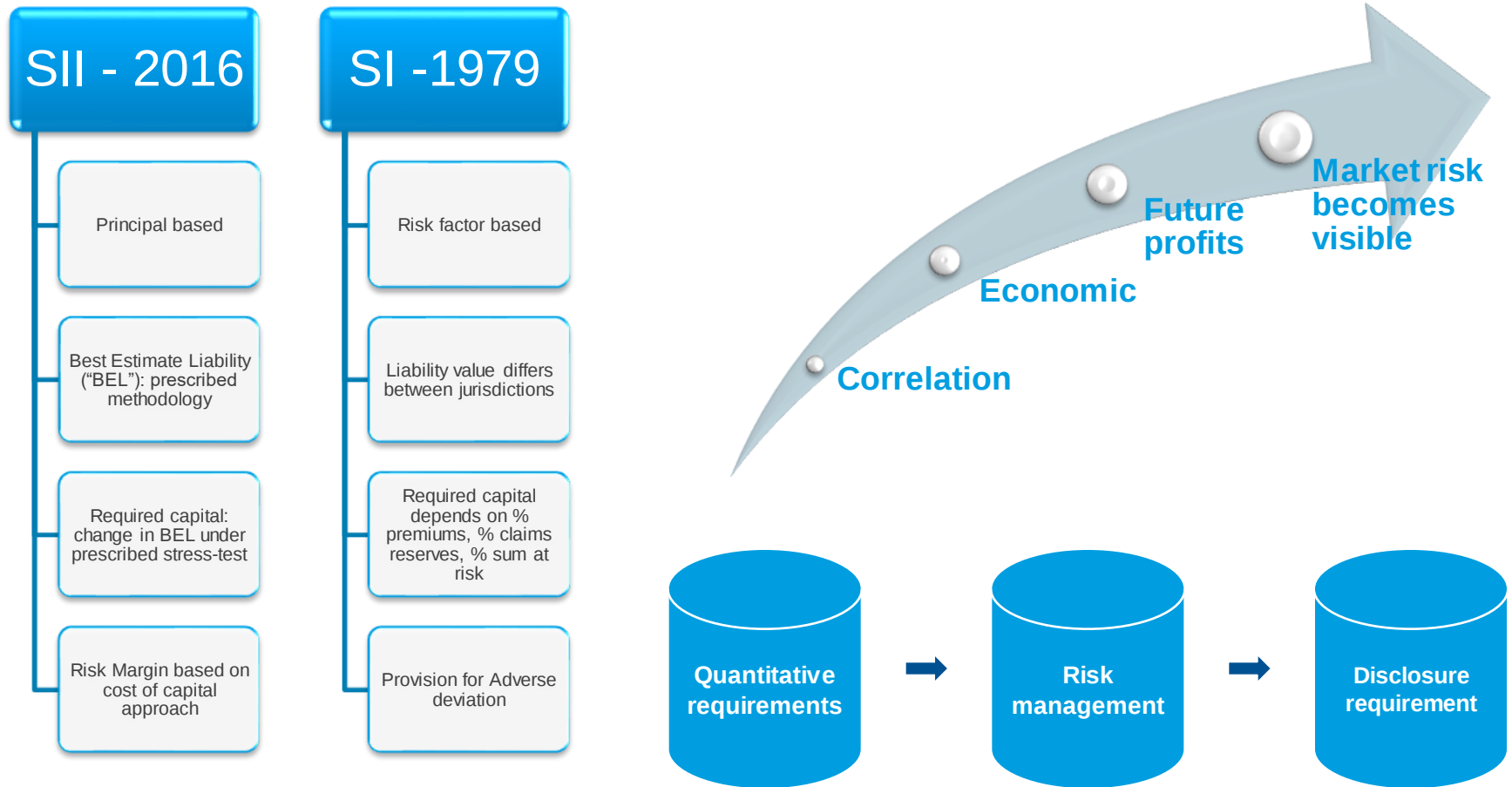
PBR: Principle-Based Reserving

RBC: Risk-Based Capital

SAM: Solvency Assessment and Management

European Solvency

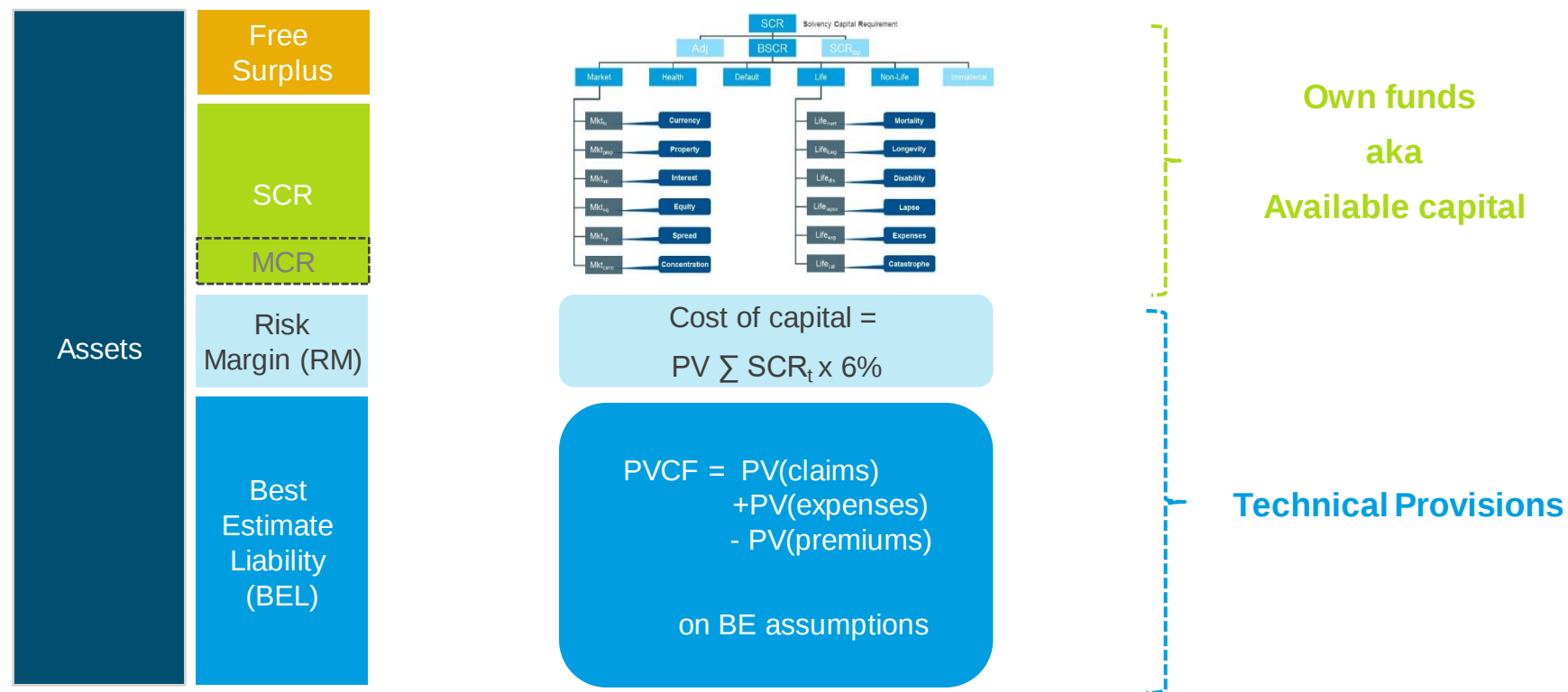
Main changes of evolution



SII's economic valuation highlights risks previously not visible

SII balance sheet

Fair value Assets and Liabilities

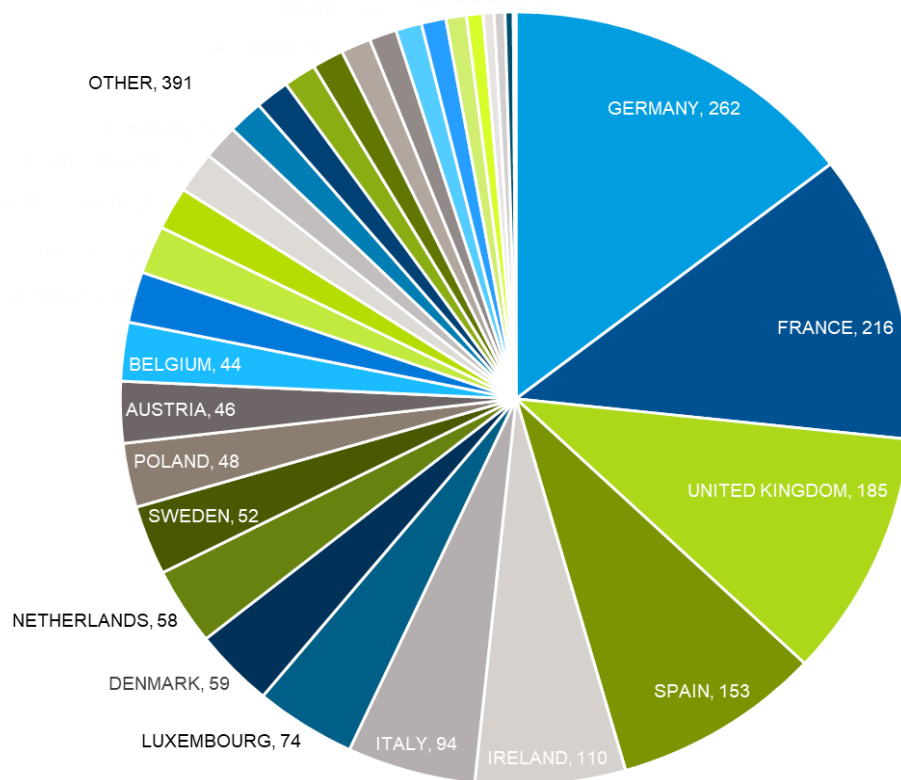


Aim: hold sufficient capital to cover obligations in 99.5% of stress scenarios

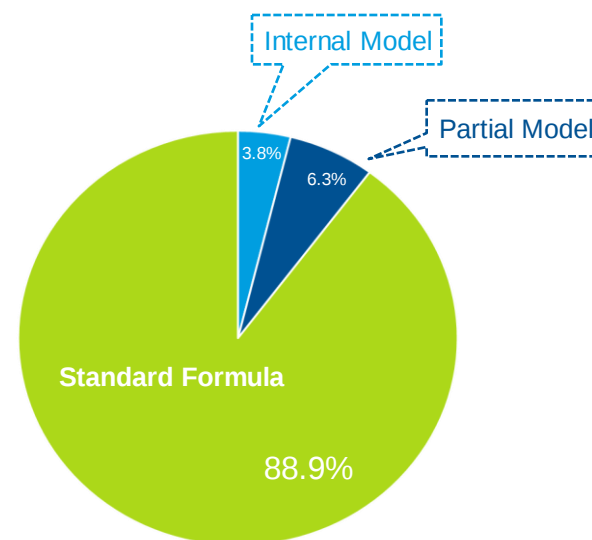
Analysis of Life SFCRs across Europe

Insights from Pillar 3 disclosures

Country representation



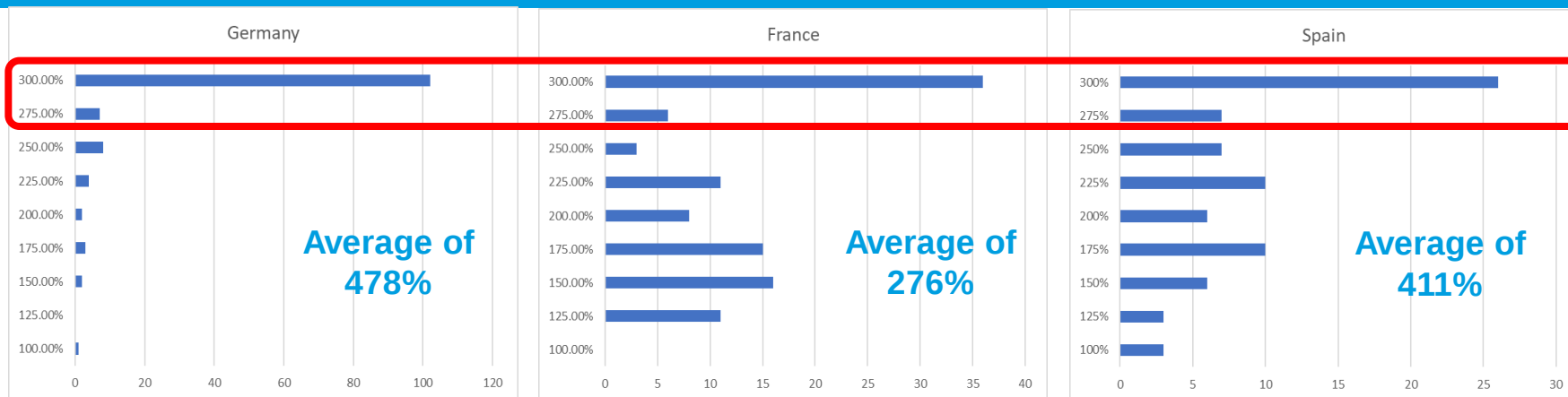
- **891** Life insurers
- **EUR 13 trillion** BEL
- **32** European countries



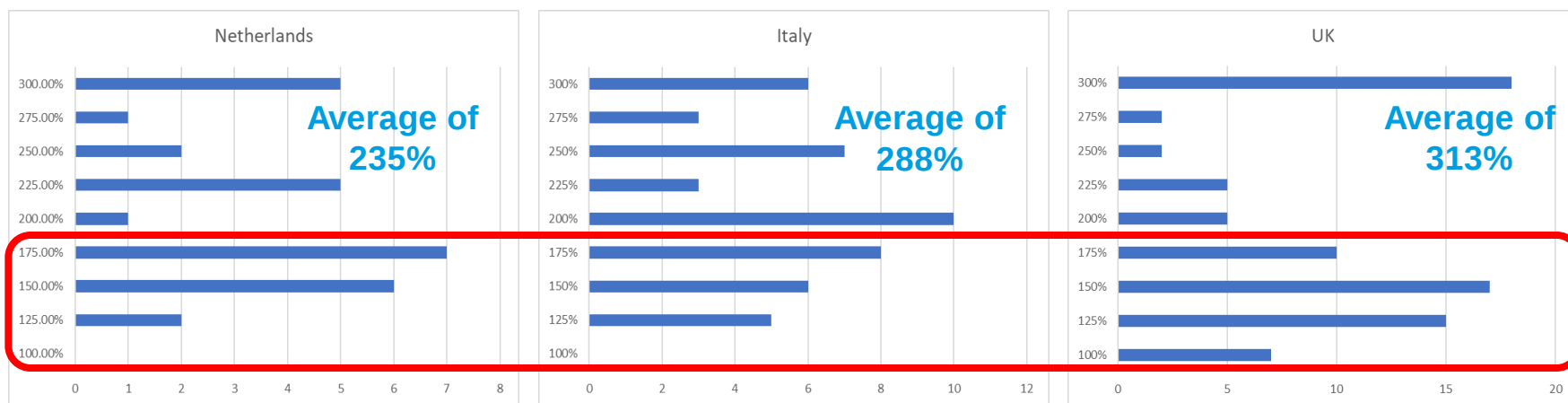
Internal model is the exception, not the norm

Distribution of Solvency Ratios

Analysis of main European countries



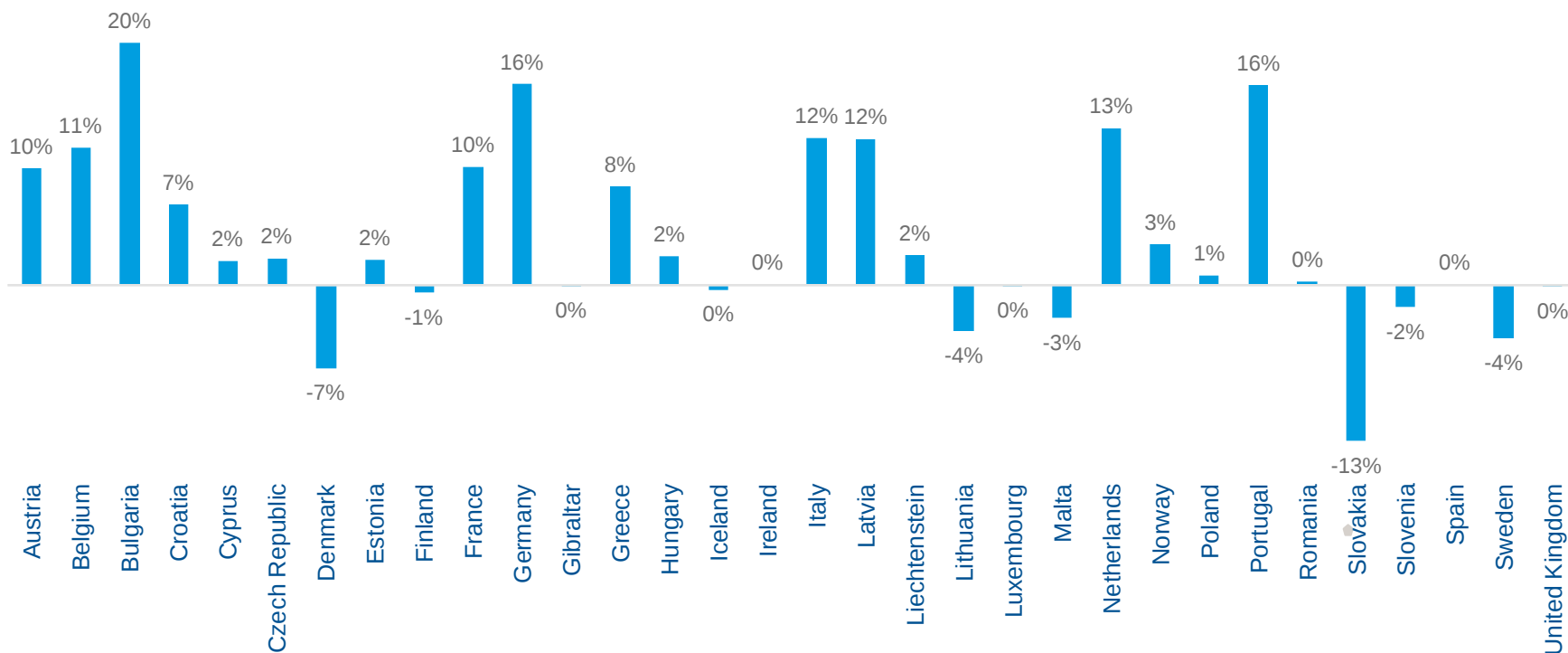
Average Solvency Ratio across Europe
= 238%



Volatility in Solvency Ratios

Year on year movement

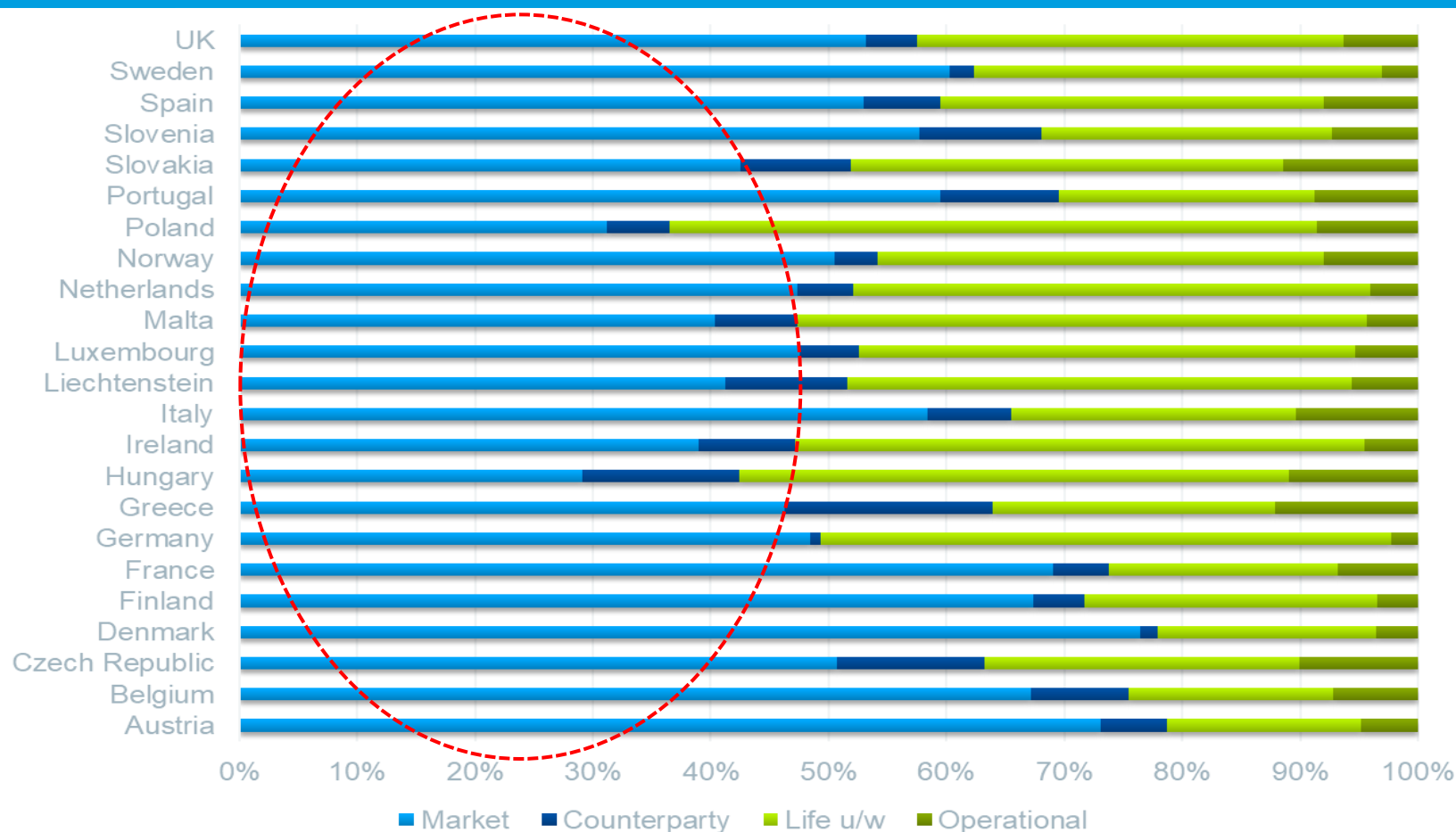
Volatility in Solvency ratios movements from 2016 to 2017



Forecasting solvency ratios become more difficult

Solvency Capital Requirements (SCR)

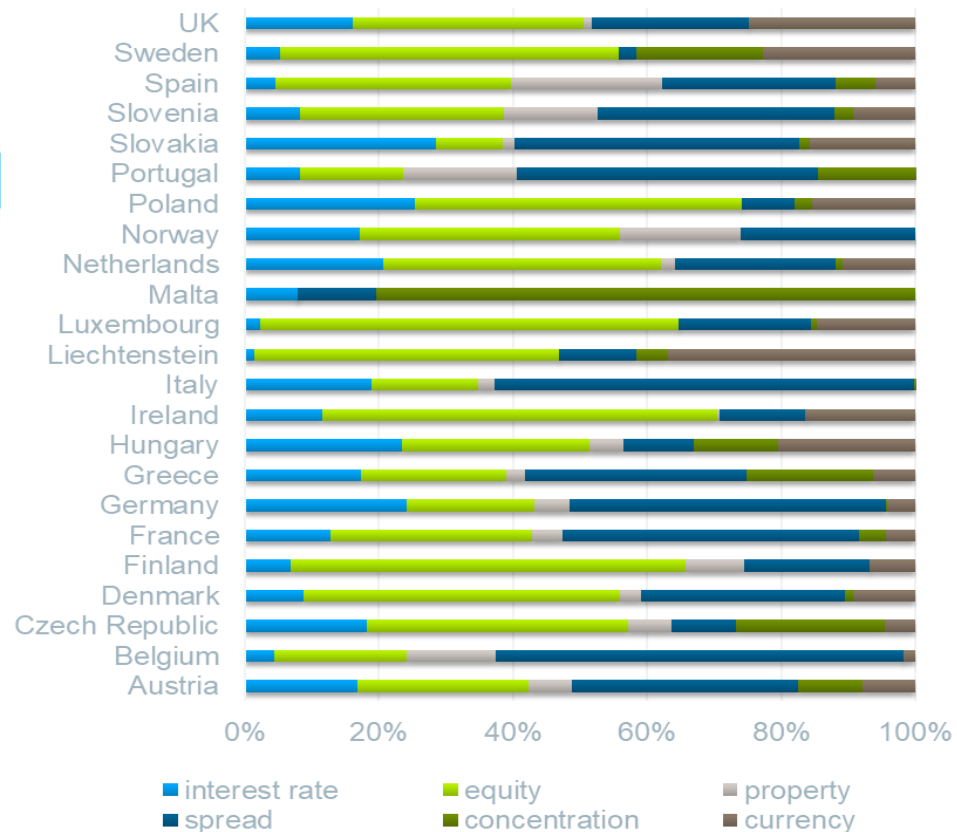
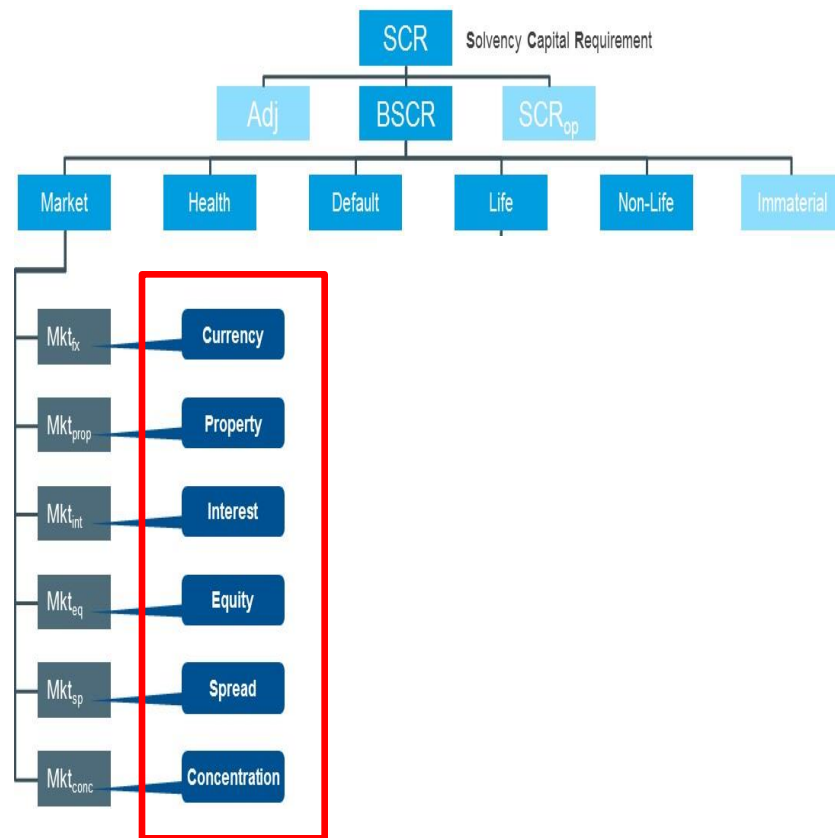
Breakdown by risk driver



Market risk dominates in Europe

Solvency Capital Requirements (SCR)

Market risk capital



Investment return comes at a cost

Market Risk

SII Standard formula required capital

Standard formula equity shock

	listed	not listed
developed markets	39%	49%
other markets	49%	49%

Standard formula spread shock

Rating	AAA	AA	A	BBB	BB	B	CCC
Duration	0	1	2	3	4	5	6
1	0.9%	1.1%	1.4%	2.5%	4.5%	7.5%	7.5%
2	1.8%	2.2%	2.8%	5.0%	9.0%	15.0%	15.0%
3	2.7%	3.3%	4.2%	7.5%	13.5%	22.5%	22.5%
4	3.6%	4.4%	5.6%	10.0%	18.0%	30.0%	30.0%
5	4.5%	5.5%	7.0%	12.5%	22.5%	37.5%	37.5%
6	5.0%	6.1%	7.7%	14.0%	25.0%	41.7%	41.7%
7	5.5%	6.7%	8.4%	15.5%	27.5%	45.9%	45.9%
8	6.0%	7.3%	9.1%	17.0%	30.0%	50.1%	50.1%
9	6.5%	7.9%	9.8%	18.5%	32.5%	54.3%	54.3%
10	7.0%	8.5%	10.5%	20.0%	35.0%	58.5%	58.5%
...	...	...	...	...	...	...	...
40	22.0%	23.4%	25.5%	40.0%	56.5%	73.5%	73.5%
41	22.5%	23.9%	26.0%	40.5%	57.0%	74.0%	74.0%
42	23.0%	24.4%	26.5%	41.0%	57.5%	74.5%	74.5%
43	23.5%	24.9%	27.0%	41.5%	58.0%	75.0%	75.0%
44	24.0%	25.4%	27.5%	42.0%	58.5%	75.5%	75.5%
45	24.5%	25.9%	28.0%	42.5%	59.0%	76.0%	76.0%
46	25.0%	26.4%	28.5%	43.0%	59.5%	76.5%	76.5%
47	25.5%	26.9%	29.0%	43.5%	60.0%	77.0%	77.0%
48	26.0%	27.4%	29.5%	44.0%	60.5%	77.5%	77.5%
49	26.5%	27.9%	30.0%	44.5%	61.0%	78.0%	78.0%
50	27.0%	28.4%	30.5%	45.0%	61.5%	78.5%	78.5%

Onerous stresses drive required capital for market risk

Market Risk

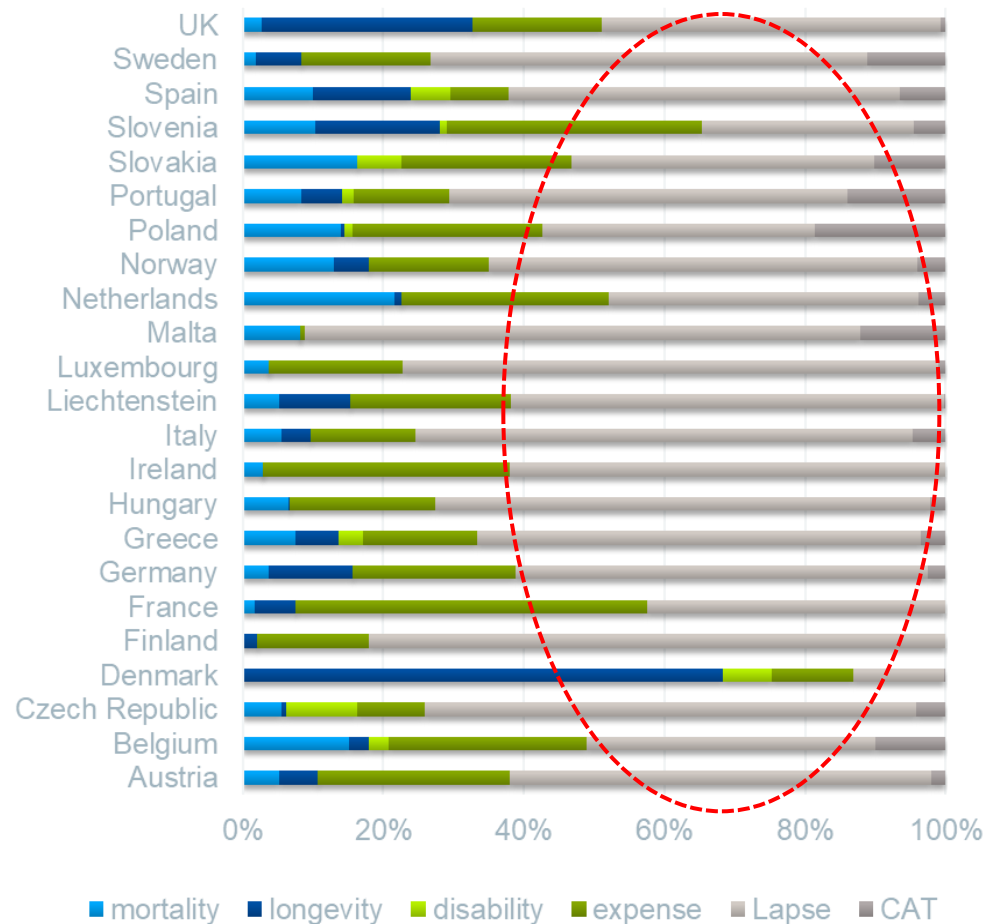
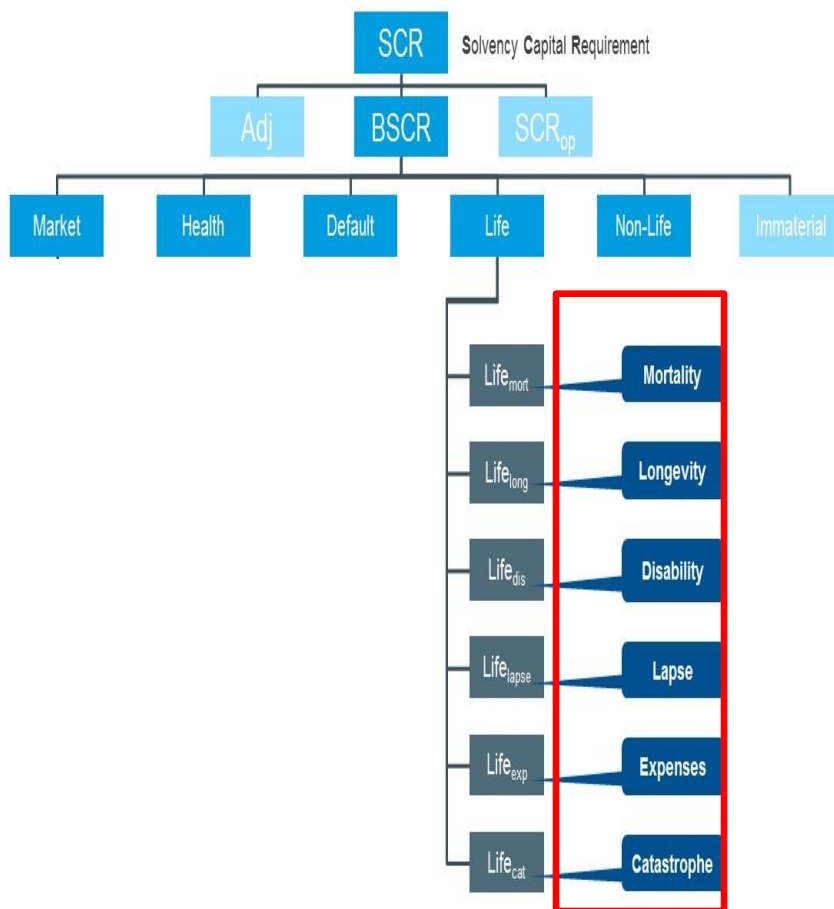
SCR based on investment portfolio composition

Insurer	Portfolio	Maturity	Initial portfolio value	Portfolio value after stress	SCR market
A	Government bonds	any	100	100	0
B	AAA corporate bonds	10 year	100	93	7
C	AAA corporate bonds	40 year	100	78	22
D	BBB corporate bonds	10 year	100	80	20
E	BBB corporate bonds	40 year	100	60	40
F	Listed equities in developed markets	NA	100	61	39
G	Real estate	NA	100	75	25

Balancing expected return with required capital cost

Solvency Capital Requirements

Underwriting capital risk drivers



Lapse risk currently binds the most capital

Behavioral Impact

What actions have taken place

► Reduce exposure

- 100% reinsurance to newly formed asset-intensive reinsurers
- Selling off non-core portfolios to run-off specialist

► Assets

- Improved ALM policies
- Balancing investment return with capital cost
- Reliance on credit assessment of rating agencies
- General disapproval for assets to be transferred to third party

► Product design

- Withdraw long-term guaranteed savings products
- Shift risk to consumers



SII can potentially encourage pro-cyclical behaviour

Behavioral Impact

What actions have taken place

► Capital optimisation

- Product mix to add more available capital
- Balancing positives and negatives pertaining to contract boundaries
- Have to balance cost versus benefit of reinsurance
- Non-proportional reinsurance deemed very effective

► Regulatory environment

- Application of SII rules vary by jurisdiction
- EIOPA reviewing elements of SII regulation



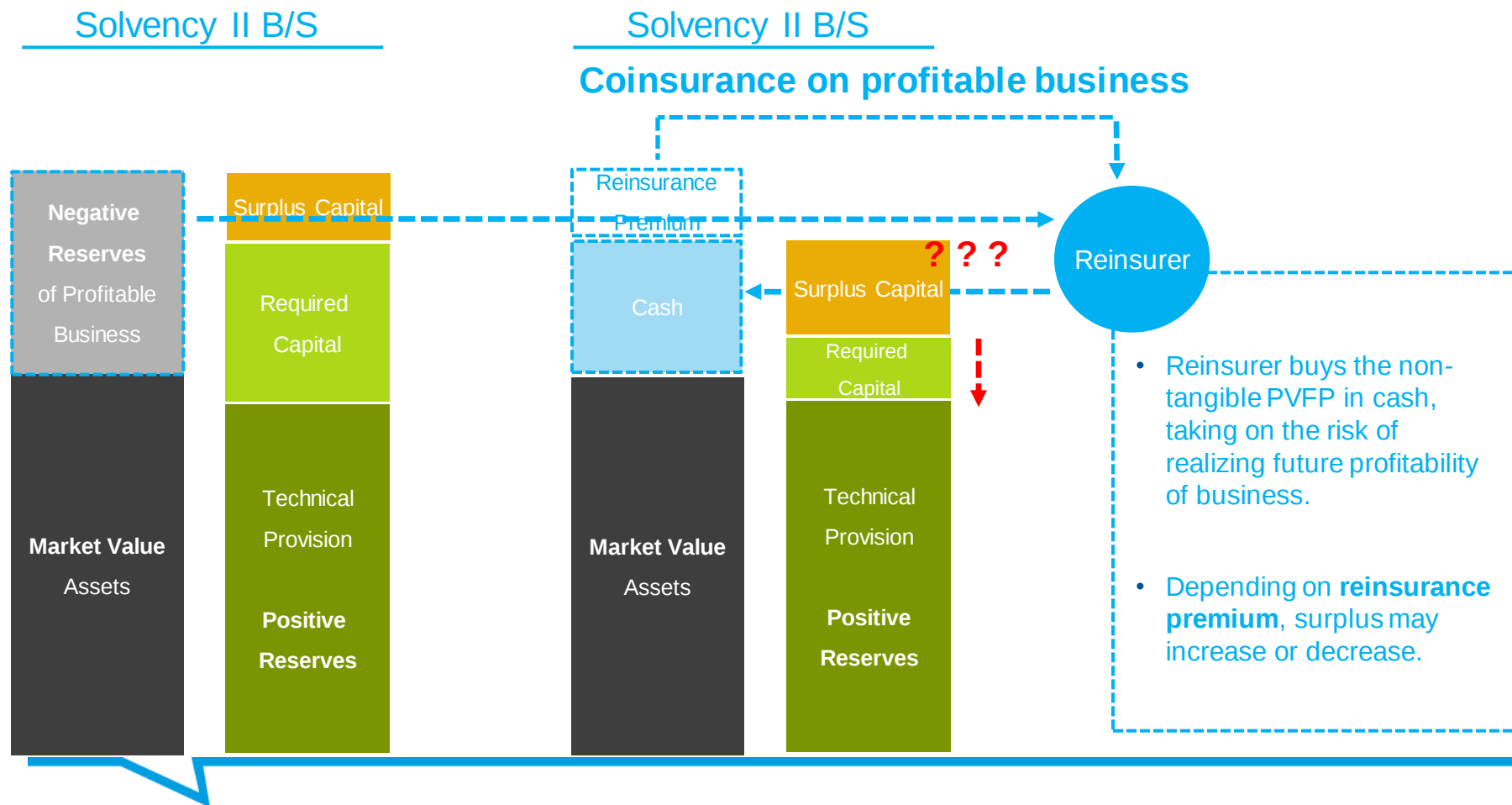
Reinsurance generally receiving more scrutiny

Reinsurance Solution under SII

Available Capital

SII Available Capital

(1) VIF transaction



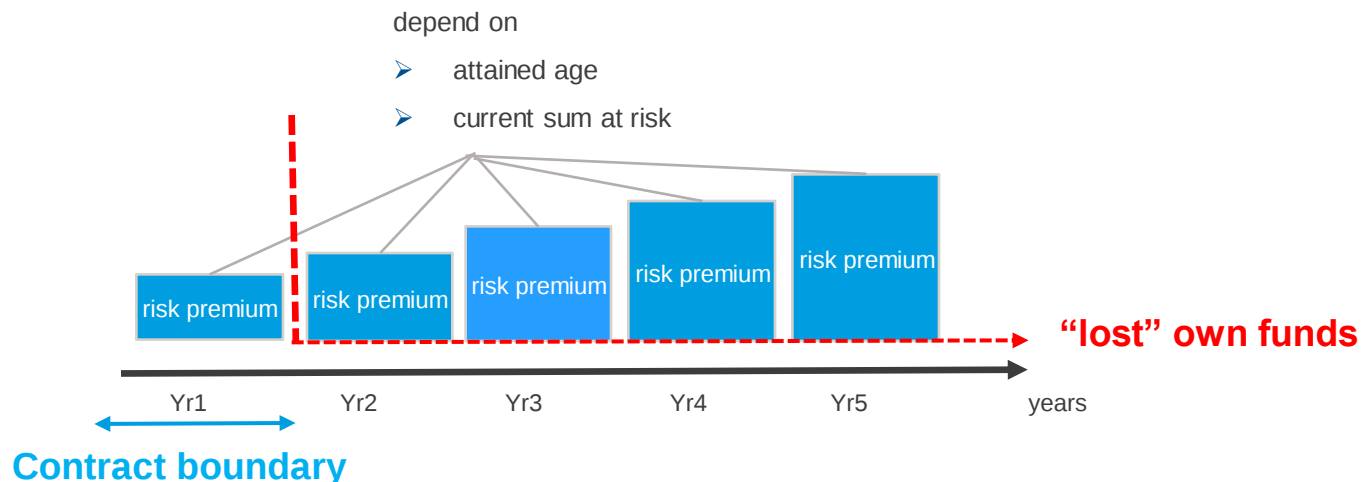
Creating liquidity by selling an admissible asset

SII Available Capital

(2) VIF transactions --- Recognition beyond Contract Boundary

- ❑ Contract boundaries in SII = point at which the (re)insurer
 - a) has a unilateral right to terminate the contract or reject the premium
 - b) has an unlimited ability to amend the premium or benefits
- ❑ Calculations of best estimate only includes future cashflows within the contract boundary

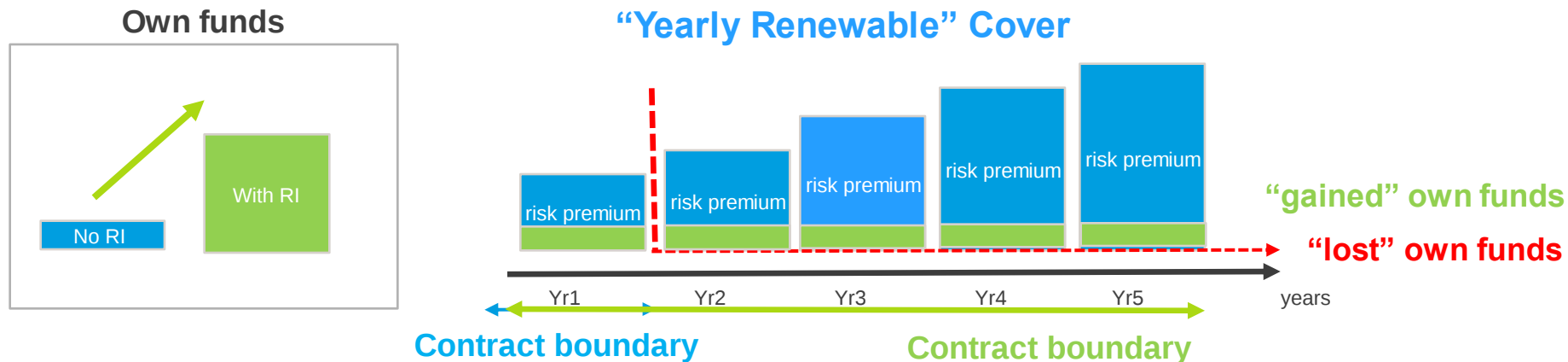
“Yearly Renewable” Cover



Reinsurer guarantees a portion of future profits

SII Available Capital

(2) VIF transactions --- Recognition beyond Contract Boundary



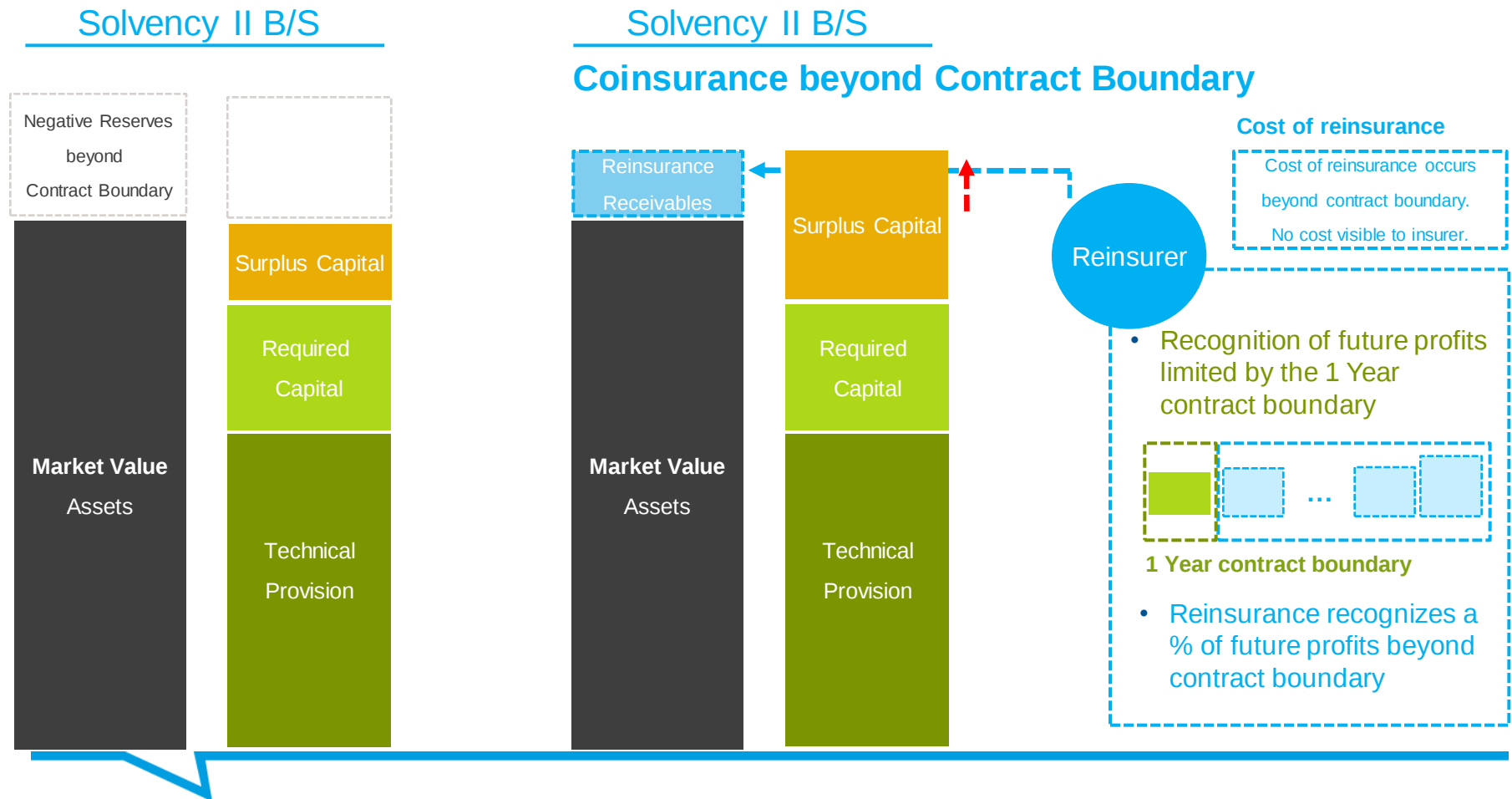
- ❖ Annual renewable group business
- ❖ Individual business with reviewable premiums

Solution = Reinsurer guarantees X% of each year profits for N years

Turning an inadmissible asset into an admissible asset

SII Available Capital

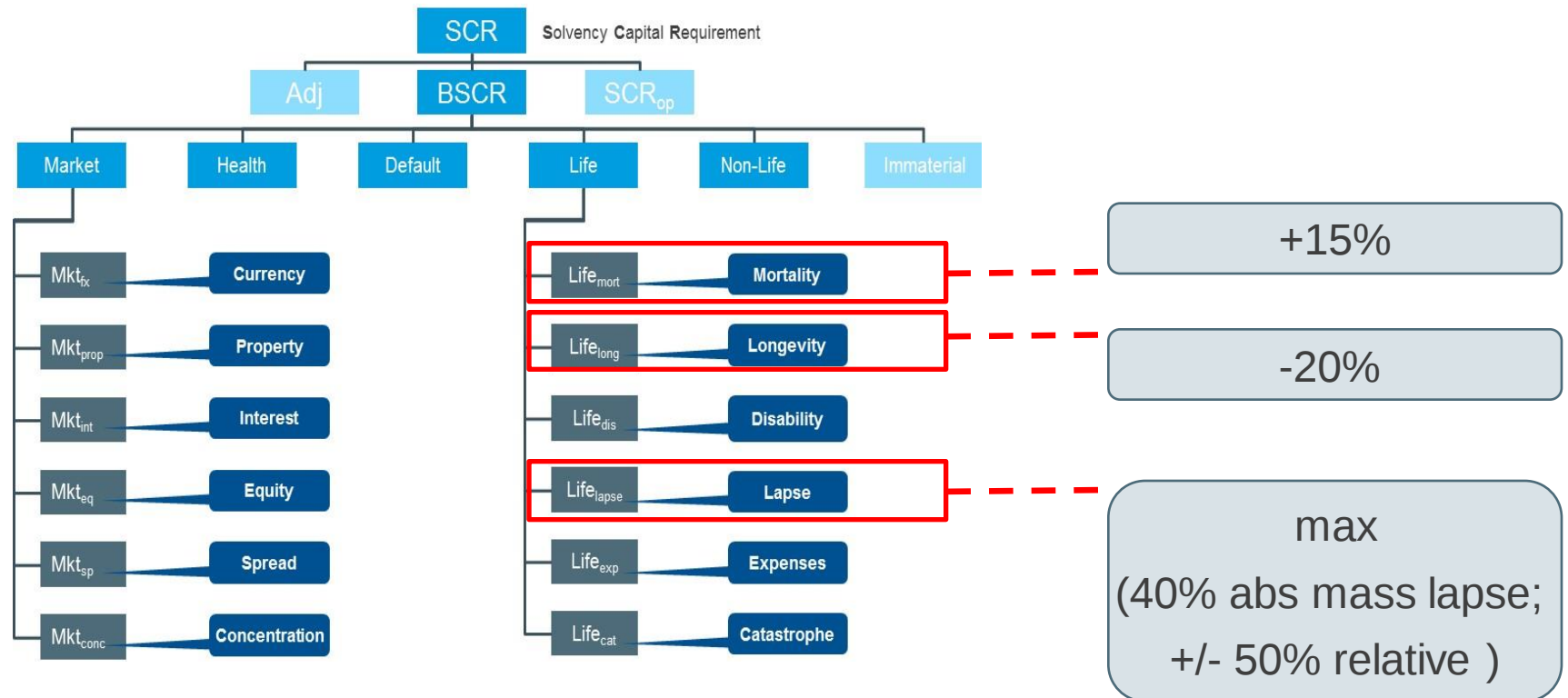
(2) VIF transactions --- Recognition beyond Contract Boundary



Reinsurance Solution under SII Required Capital

SII Required Capital (SCR)

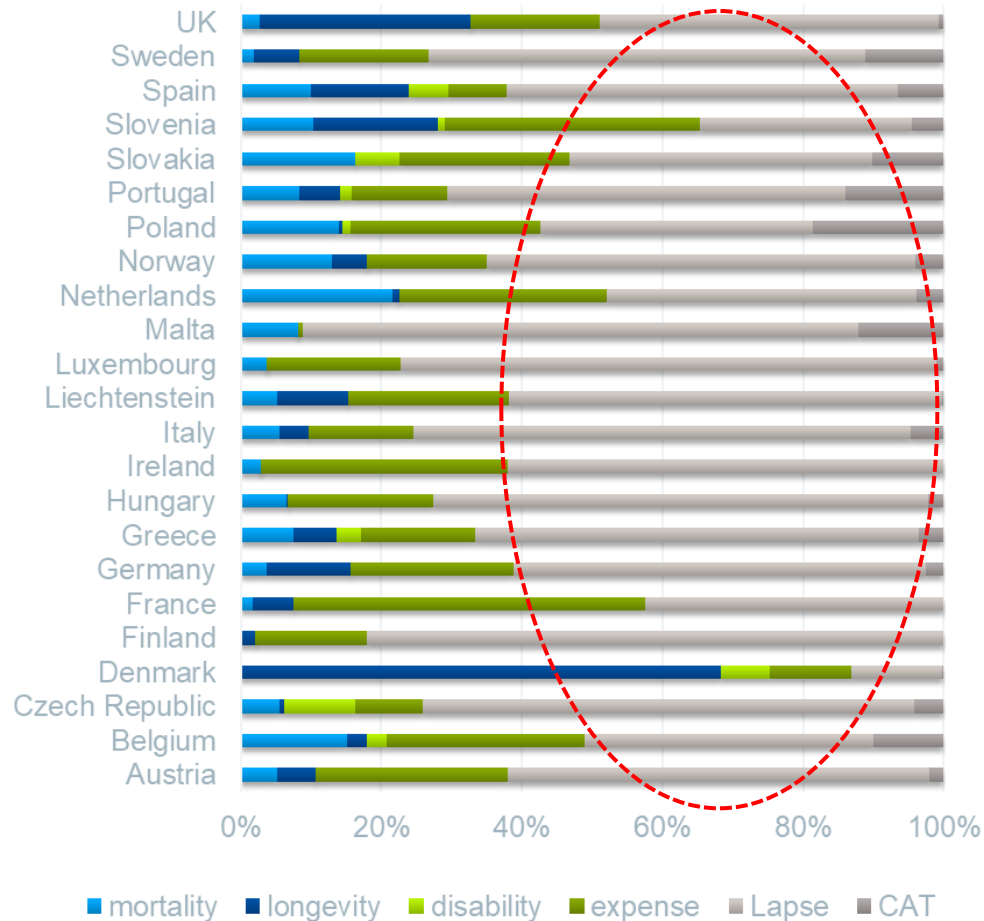
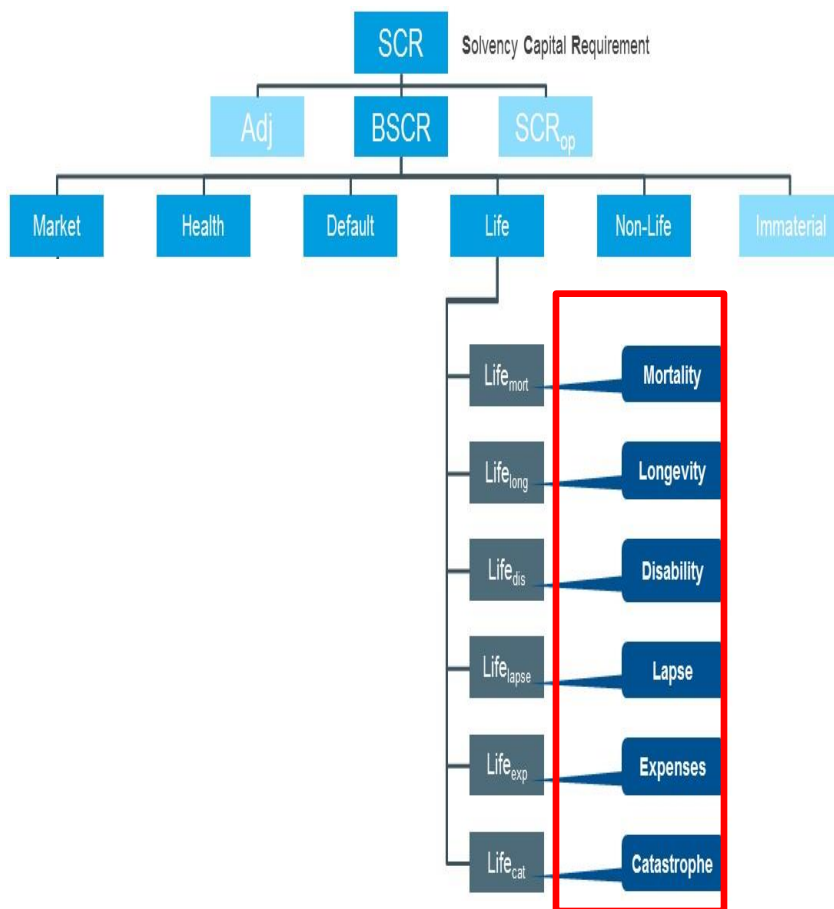
Stress 1 in 200 year event



Aggregation of component SCR with correlation

Solvency Capital Requirements

Underwriting capital risk drivers



Lapse risk currently binds the most capital

Lapse Risk under Solvency II

Subtitle

Risk Capital for Life Insurance Companies*

		% Risk Capital	% UW risk
Market Risk	1	81.7%	
Default Risk		4.7%	
Underwriting Risk		38.7%	100%
Lapse Risk	2	59.1%	
Expenses Risk			19.9%
Mortality Risk			0.2%
Longevity Risk			
Disability Risk			
Catastrophe Risk			15.8%
Diversification Effect		-25.1%	-38.0%

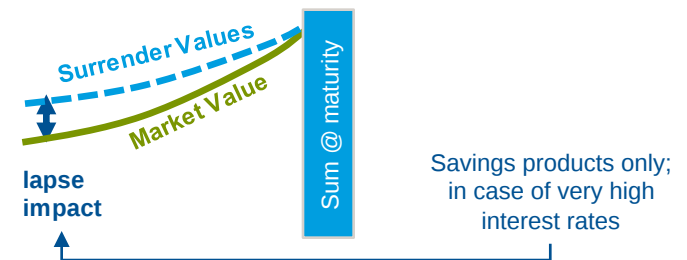
Lapse stresses

- ▶ +50%/-50% of best estimate
- ▶ mass lapse of 40%

* Results from Solvency II Quantitative Impact Study (QIS)

Lapse losses in Solvency II-type regimes 3 different sources

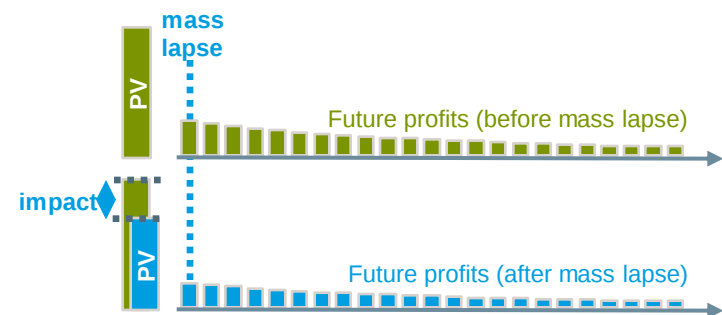
1 Surrender Value > Market Value



2 Negative Reserves

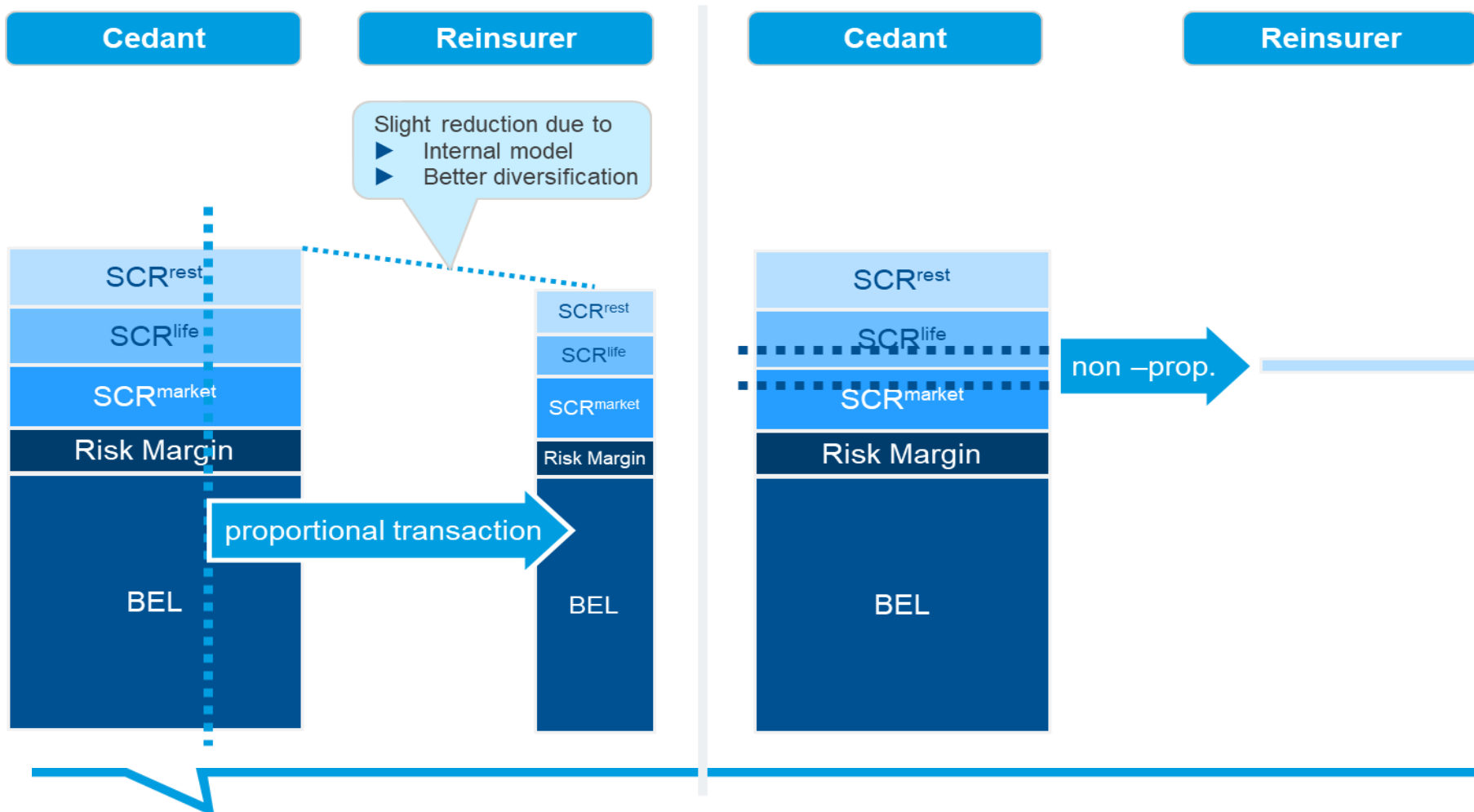
→ lapse losses in the primary insurers' annual statements (e.g. South Africa; rarely in Europe)

3 Loss of Future Profits



SII Required Capital (SCR)

More efficient solutions than proportional reinsurance

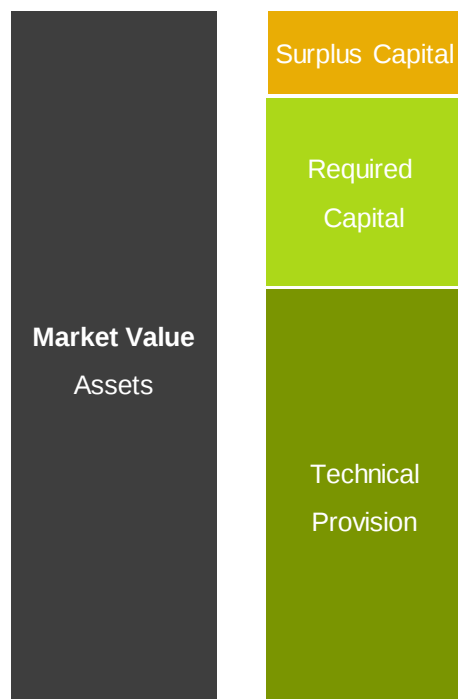


SII does not specify exactly how non-proportional structures should be treated

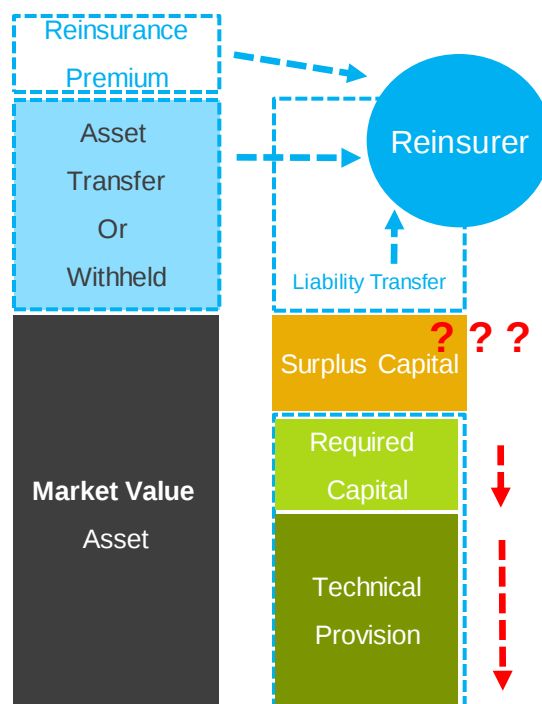
SII Required Capital

Coinsurance vs Stop-Loss Reinsurance

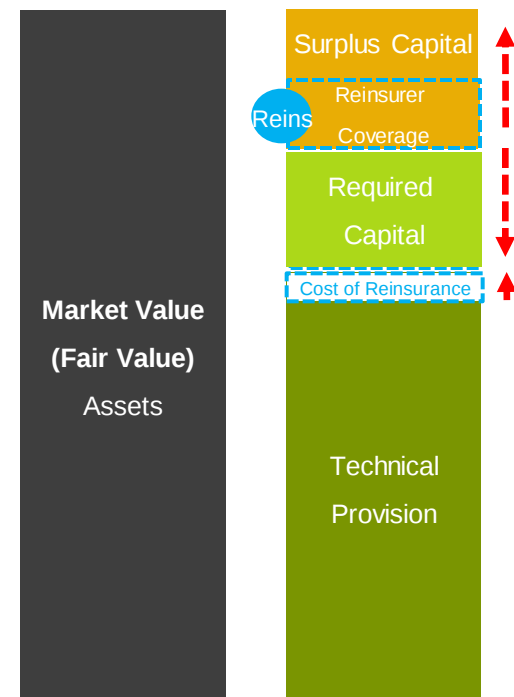
Solvency II B/S



Solvency II B/S Coinsurance (50% QS)



Solvency II B/S Stop-loss reinsurance



Stop-loss reinsurance is cheaper and more surgical than coinsurance

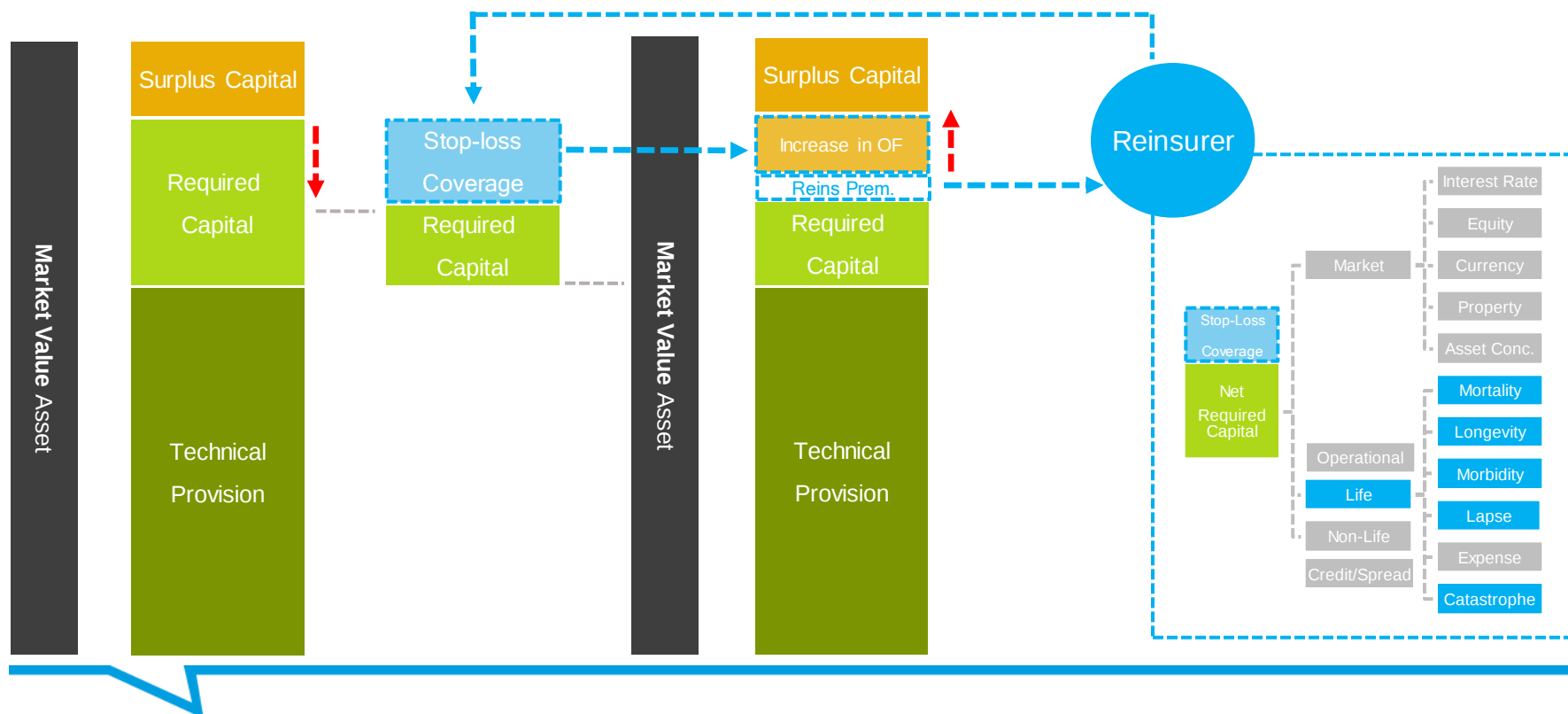
SII Stop Loss

Stop-Loss reinsurance under Solvency II

Solvency II B/S

Solvency II B/S

Stop-loss reinsurance



Non-proportional reinsurance solutions effectively optimise required capital

Lapse SCR

Example: Mass lapse component (simplified)

Maximum of:

- +50% long-term lapse stress
- -50% long-term lapse stress
- instantaneous 40% mass lapse

Financial resources Best estimate

Assets
100

Tech
Prov
-500

Own
Funds
600

Required capital
for lapse risk

Own
Funds
400

Loss
200

Financial resources Mass lapse stress

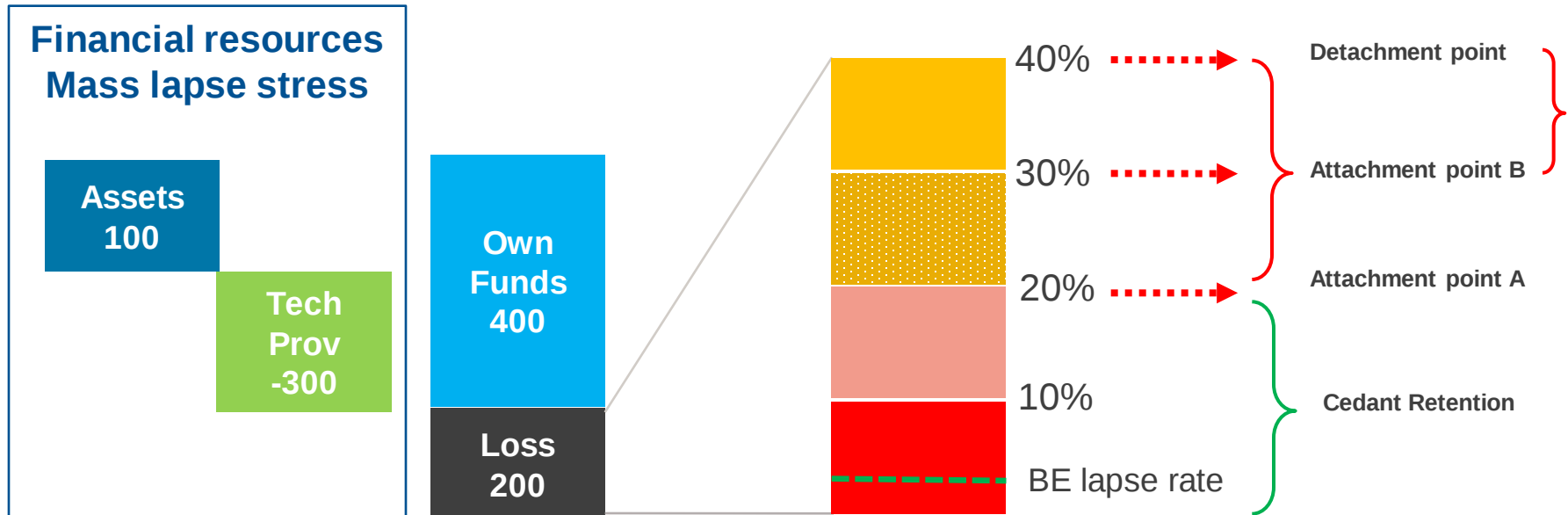
Assets
100

Tech
Prov
-300

SCR represents the loss in own funds under prescribed stress

Lapse SCR

Example: Mass lapse component (simplified)



Reinsurer's Claim:

- ❖ Fixed per policy amount per lapse
- ❖ Loss in own funds per policy

Price reduces as attachment point increases

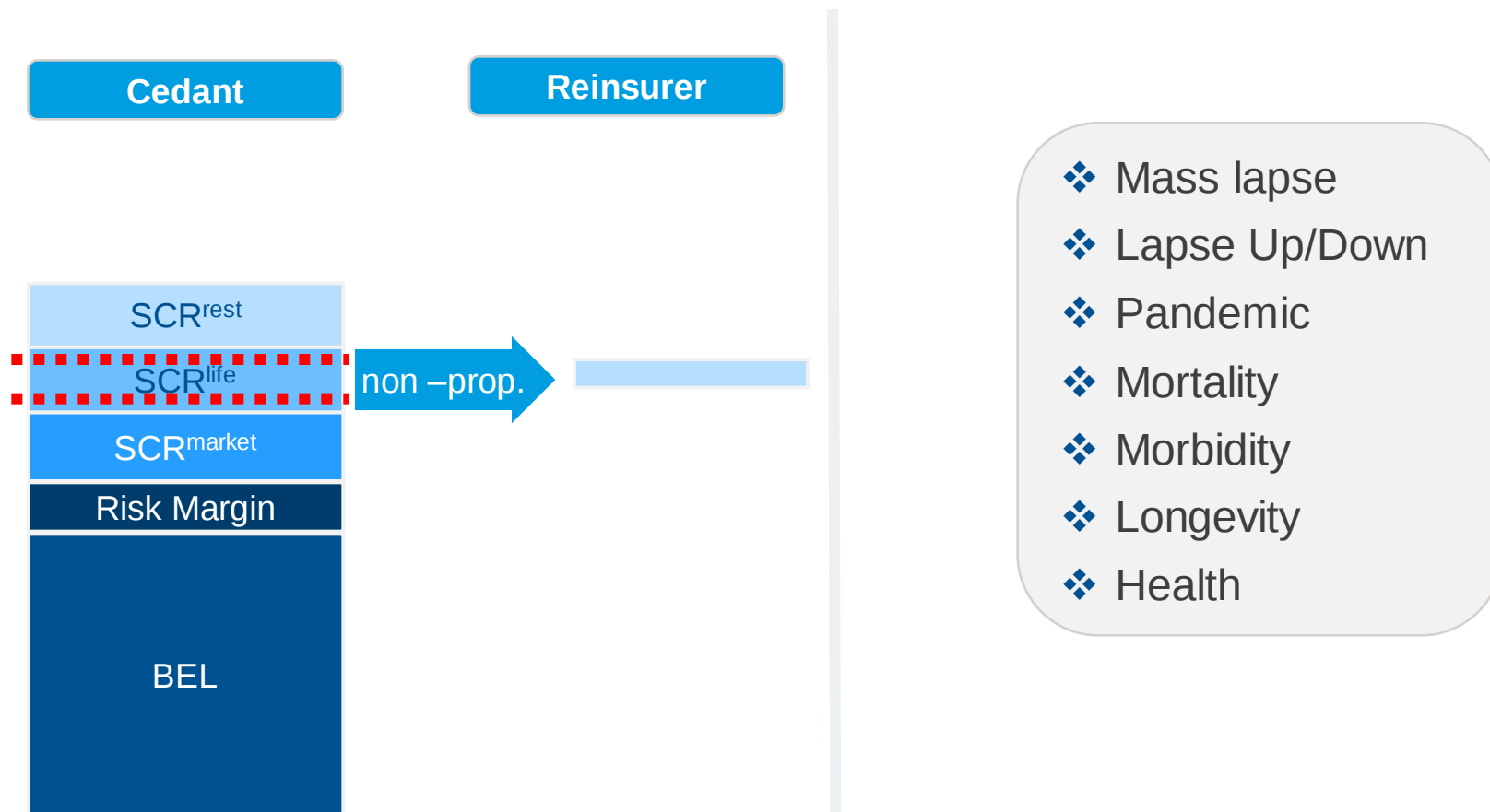
Mass Lapse Reinsurance

Considerations when setting the price

- ▶ Insurance contract classification
 - ❖ Protection
 - ❖ Savings
 - ❖ Credit-linked
- ▶ Macro climate
 - ❖ Economic environment
 - ❖ Regulator environment
- ▶ Underlying portfolio
 - ❖ Size
 - ❖ Diversification
 - ❖ Best estimate lapse rate
 - ❖ Stability of lapse rates
- ▶ Reinsured risk
 - ❖ Retention
 - ❖ Attachment point
 - ❖ Duration of coverage
- ▶ Company
 - ❖ Start-up versus established

SII Required Capital (SCR)

Non proportional solutions



Capital optimisation can be implemented on various risks

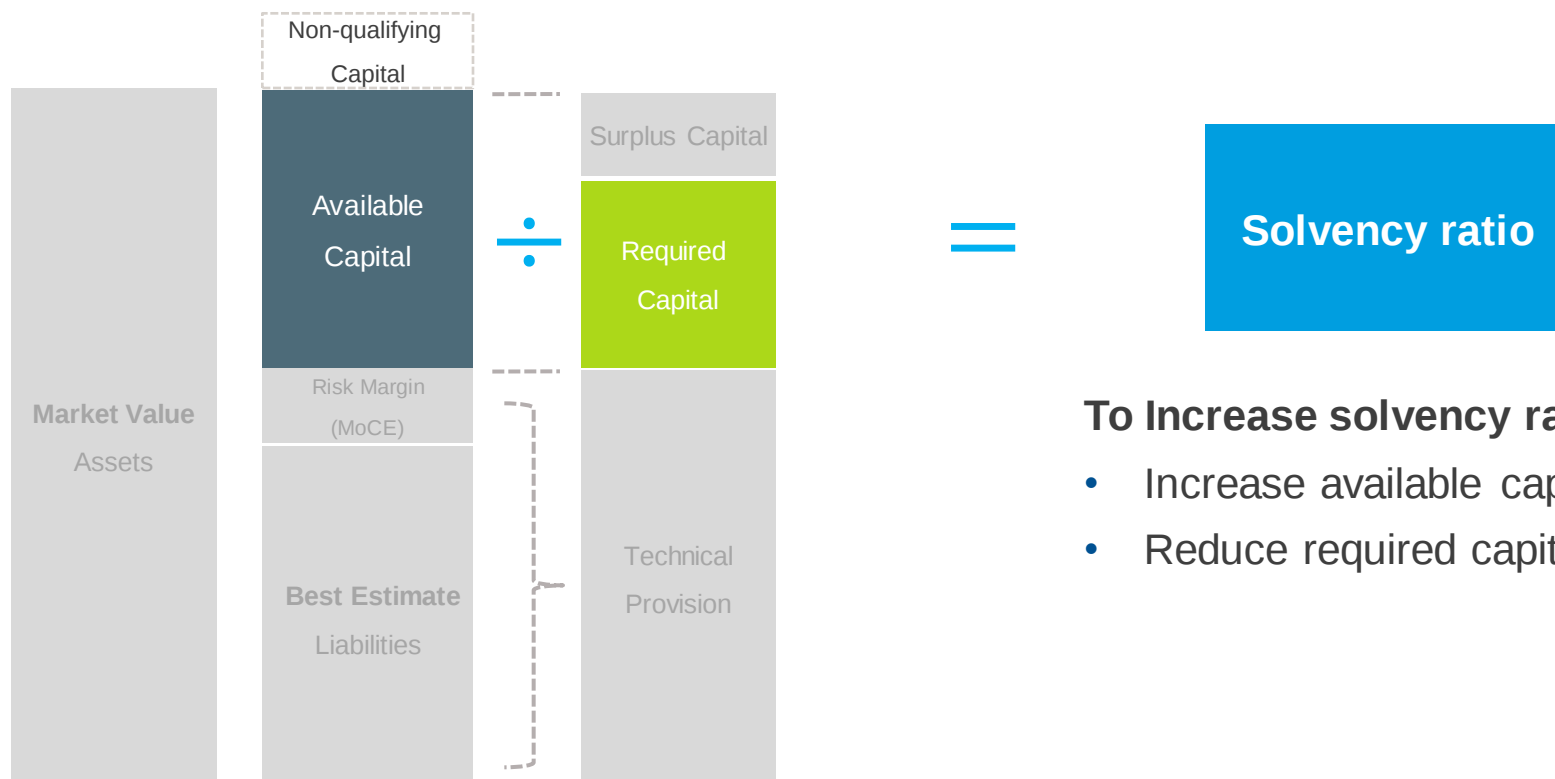
Conclusion

Reinsurance is a powerful capital management tool

Economic Capital Regime

Solvency ratio

Economic balance sheet



To Increase solvency ratio

- Increase available capital, or/and
- Reduce required capital

Often, reducing the required capital is much more powerful

Capital sourcing

Reinsurance as a Capital Management tool

Potential capital sources:		Pros	Cons	Available Capital	Required Capital
Capital	e.g. Sub debts, Hybrid bonds	Flexible	Interest burden	✓	
Derivatives	e.g. Interest rate, fx				✓
Portfolio Steering	NB Sales: protection / unit-linked Inforce: retention, reprice	Organic	Long-term	✓	✓
Reinsurance Solutions	Coinsurance	Positive reserve	Full risk transfer	✓	✓
		Negative reserve (Value In-force)	Full risk transfer Liquidity	✓	✓
		Contract boundary	Immediate Simple Cheap	✓	
	Stop-loss	• Mass lapse • Longevity • Pandemic	Immediate Simple Cheap		✓

Reinsurance is a tool-box for capital management

Conclusion

Financial reinsurance is a powerful tool

- ▶ Reinsurance structures:
 - ❖ Transfers risk to reinsurer
 - ❖ Are internationally recognized by Regulators
 - ❖ Serves as an cost effective source of capital
 - ❖ Is flexible and can be altered to suite the changing need
 - ❖ Easy to execute
 - ❖ Can be as simple or complex as required



Allows cedants to achieve KPIs



Q&A