

# 19<sup>th</sup> Current Issues in Life Assurance (CILA) Hotel Sea Princess, Mumbai

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## Update on RBC - Asia



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# Disclaimer

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# Agenda

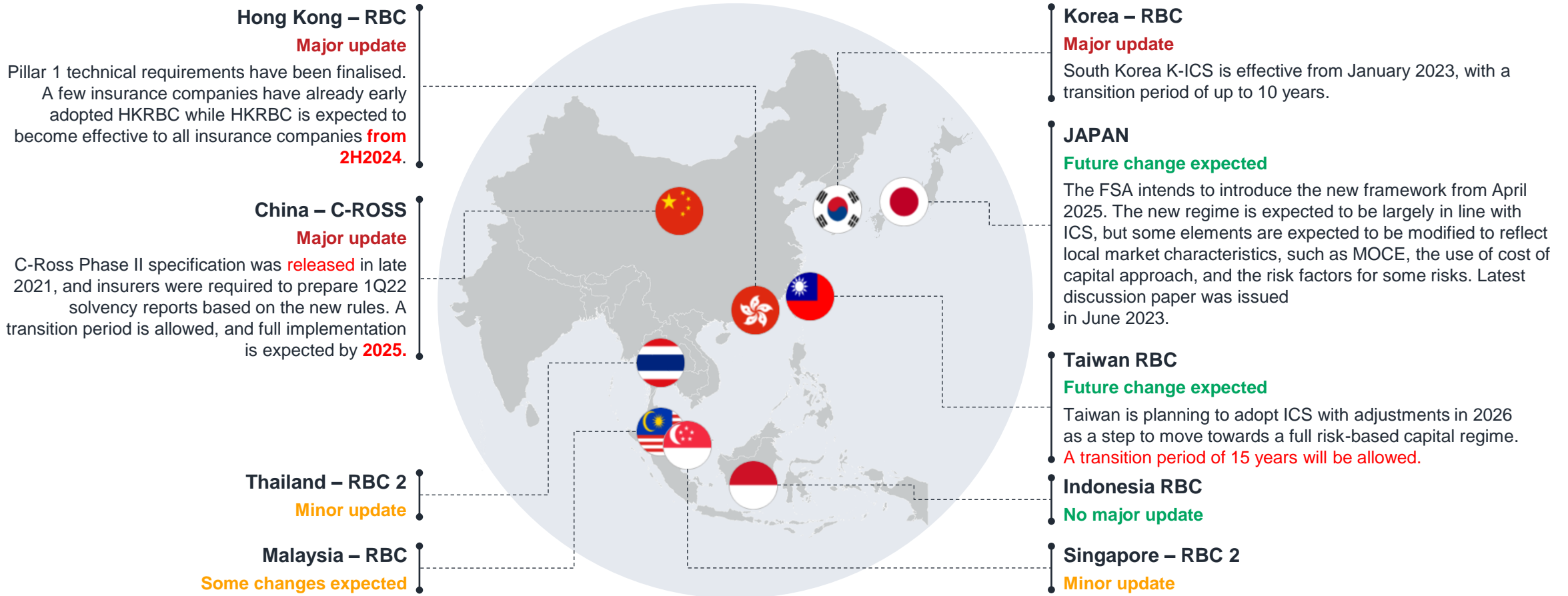
- Recent capital regime updates
- Topical issue 1: Discount rate and analysis on matching adjustment
- Topical issue 2: Impact of market volatility on solvency position
- Topical issue 3: Loss absorbency

# Recent capital regime updates



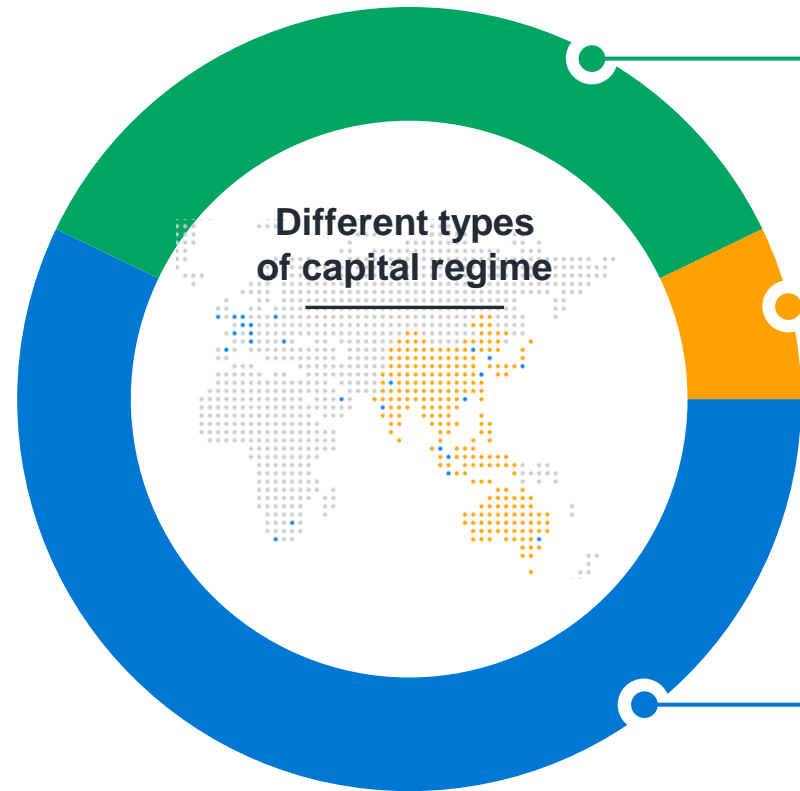
# Recent capital regime updates across Asia

Recent major developments of capital regimes



# Recent capital regime updates across Asia

Overview of Asian capital regimes' developments



## FACTOR-BASED

- India
- Hong Kong (existing HKIO basis)



$$\text{Capital} = ax + by$$

## FACTOR-BASED (US RISK-BASED)

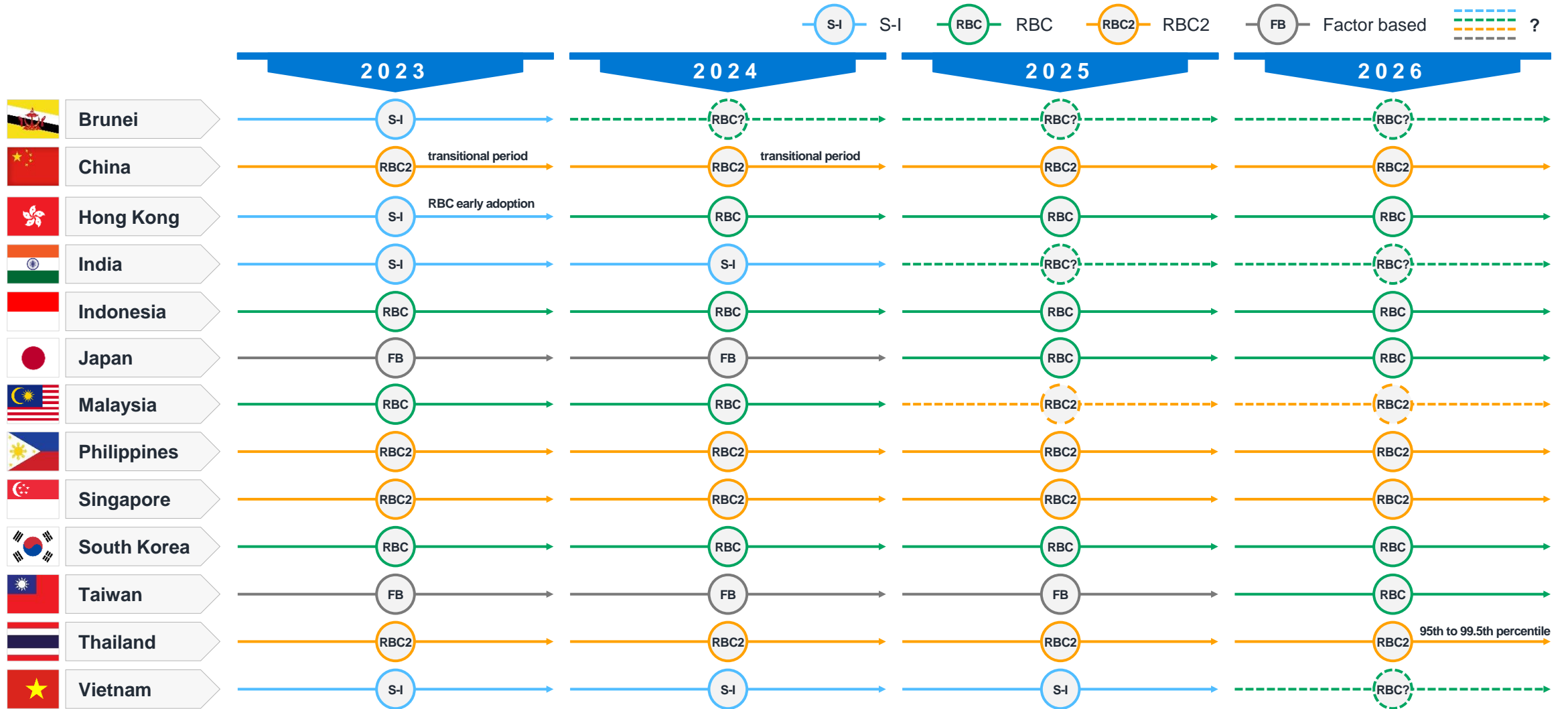
- Japan (regulatory)
- South Korea "legacy" RBC
- Taiwan RBC (existing)
- Bermuda BSCR 
- US RBC 

C1	Asset Risk
C2	Insurance Risk
C3	Interest Rate Risk
C4	Business Risk
$(C4 + \sqrt{(C1 + C3)^2 + C2^2})^3$	

## RISK-BASED

- |                 |                   |                     |
|-----------------|-------------------|---------------------|
| ▪ China C-ROSS  | ▪ Malaysia RBC    | ▪ South Korea K-ICS |
| ▪ Hong Kong RBC | ▪ Singapore RBC 2 | ▪ Taiwan T-ICS      |
| ▪ Indonesia RBC | ▪ Thailand RBC 2  |                     |

# Maturity of RBC Frameworks



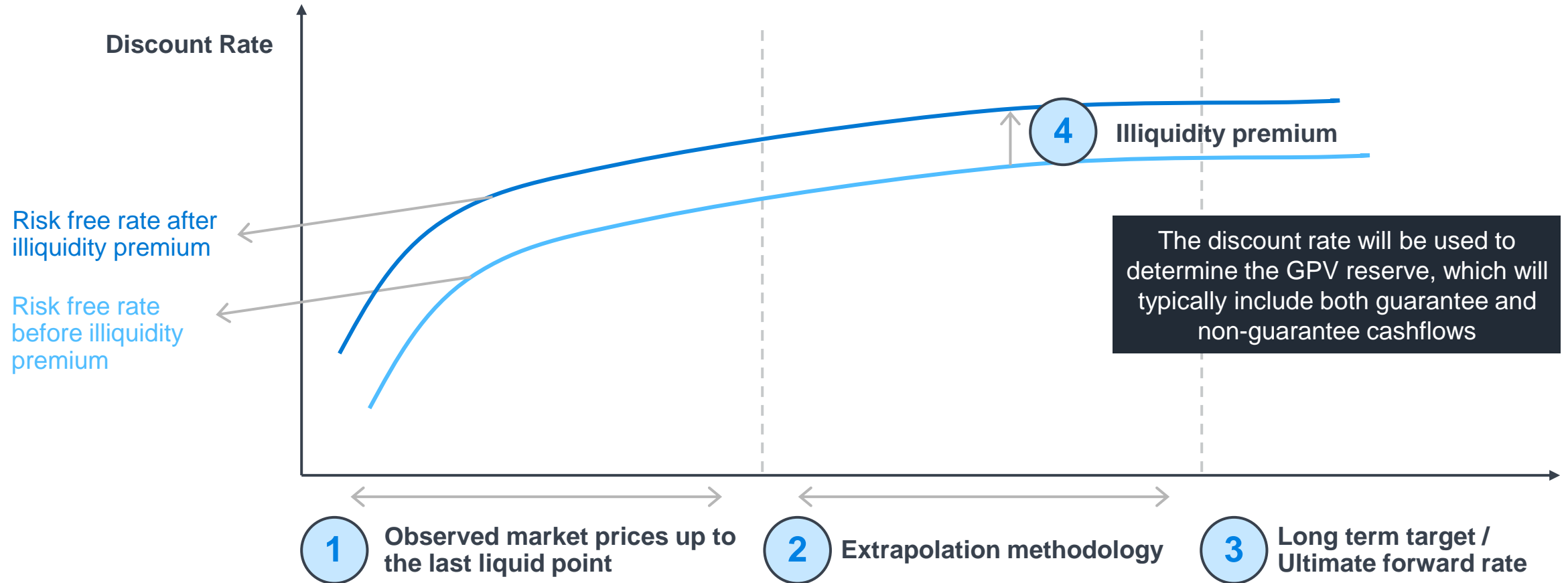
# Topical issue 1: Discount rate and analysis on matching adjustment





# Liability valuation basis

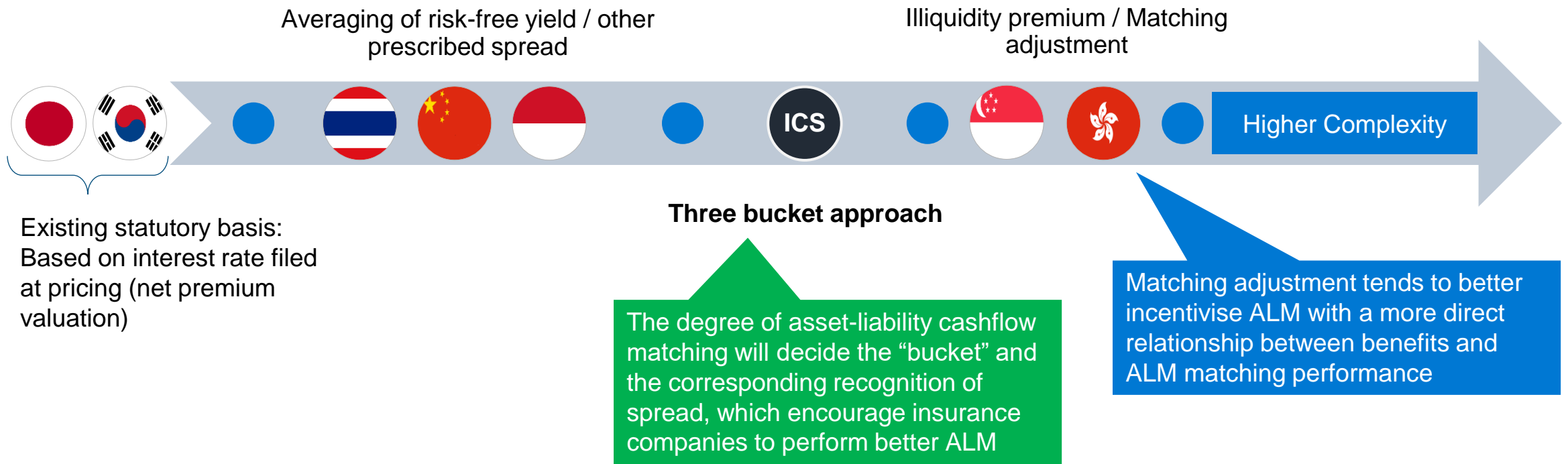
Discount rate definition – A bottom-up approach



# Liability valuation basis

Illiquidity premium and matching adjustment

Illiquidity premium / smoothing adjustments are common under RBC frameworks and typical act as a countercyclical capital measure. However, the prescribed approach and complexity vary across regimes:



# Matching adjustment

Comparison of the application of this in two key Asian markets



	Hong Kong RBC (Early Adoption)	Singapore RBC2
Use of Illiquidity Premium	✘	✔
Use of MA	✔	✔
<b>Key features for MA</b>		
<b>Eligibility of MA</b>	<ul style="list-style-type: none"> <li>All products are eligible. <b>NO regulatory approval is needed.</b></li> </ul>	<ul style="list-style-type: none"> <li>Non unit-linked products, subject to asset eligibility, cash flow matching and predictability test. <b>NEED regulatory approval</b></li> </ul>
<b>Applicability of MA</b>	<ul style="list-style-type: none"> <li>Guaranteed &amp; non-guaranteed cash flows</li> </ul>	<ul style="list-style-type: none"> <li>Guaranteed cash flows only (Minimum condition liability or “MCL”)</li> </ul>
<b>Calculation of MA</b>	<ul style="list-style-type: none"> <li>“Prescribed formula” explicitly includes the asset-liability duration mismatch and cash flow short-fall in MA</li> </ul>	<ul style="list-style-type: none"> <li>Based on the cash flow of underlying asset and liability, adjusted by default and downgrade of asset</li> </ul>

# Matching adjustment

Differences in derivation



## Calculation of MA

**Singapore  
RBC2**

Subject to asset eligibility, cash flow matching and predictability test, equal to:

$$\begin{aligned} & IRR(\text{Eligible asset cashflows}) - IRR(\text{Guar. liability cashflows up to the longest asset cash flow}) \\ & - \text{adjustment for default \& downgrade of fixed income assets} \end{aligned}$$

**Hong Kong  
RBC  
(Early  
Adoption)**

$MA = \text{Adjusted Spread} \times \text{Predictability Factor} \times \text{Duration factor}$	<b>Part 1</b>
$+ \text{Constant Prescribed Spread} \times \text{Predictability Factor} \times$ $\text{Max} \left[ \text{Min}(\text{Prescribed Cap of 20\%, Eligible Asset \%} - \frac{\text{Asset Dollar Duration}}{\text{Liability Dollar Duration}}), 0 \right]$	<b>Part 2</b>
$+ LTA \times \text{equity and property proportion (for segregated MA portfolios only)}$	<b>Part 3</b>

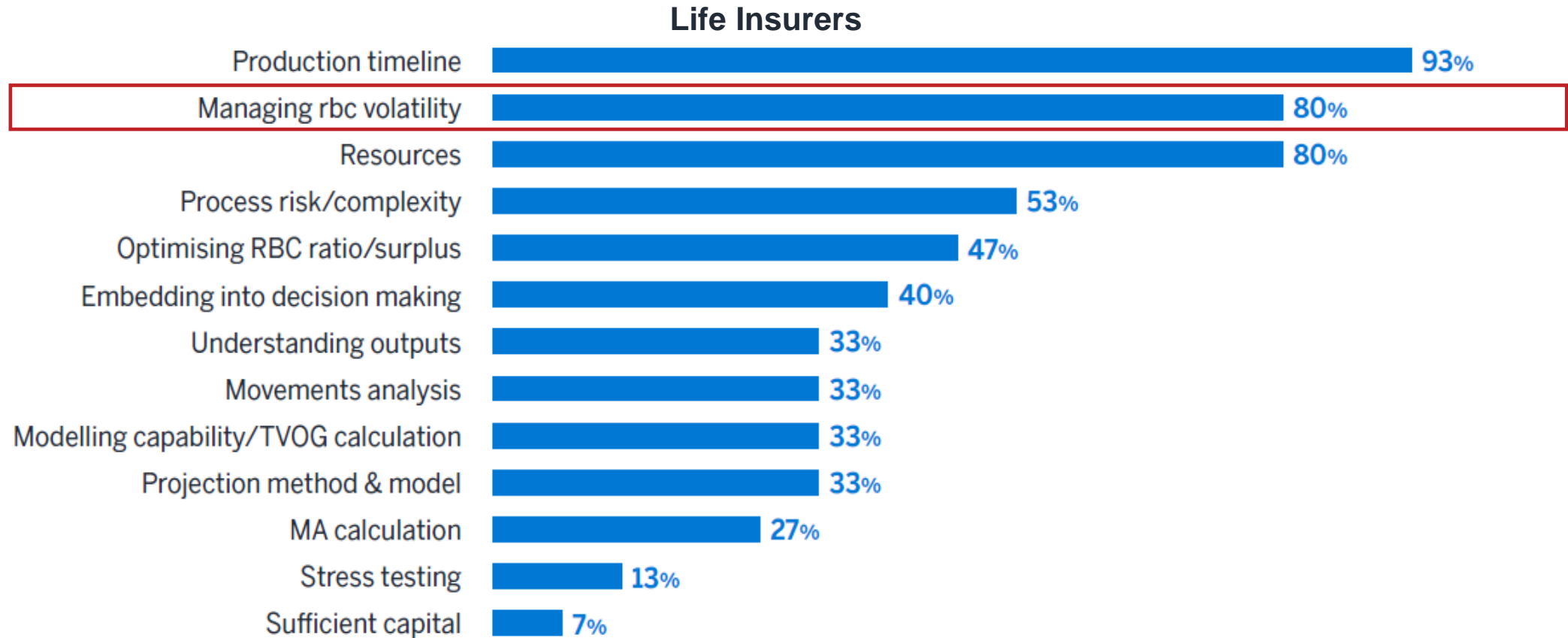
Under Hong Kong RBC, insurers are also allowed to calculate:  
(1) Dynamic MA (for credit spread risk scenario); and  
(2) Stressed MA (recalculation of duration factor).

# Topical issue 2: Impact of market volatility on solvency position



# Before the implementation of ICS

What are the key challenges for ICS-like regime implementation and operation?

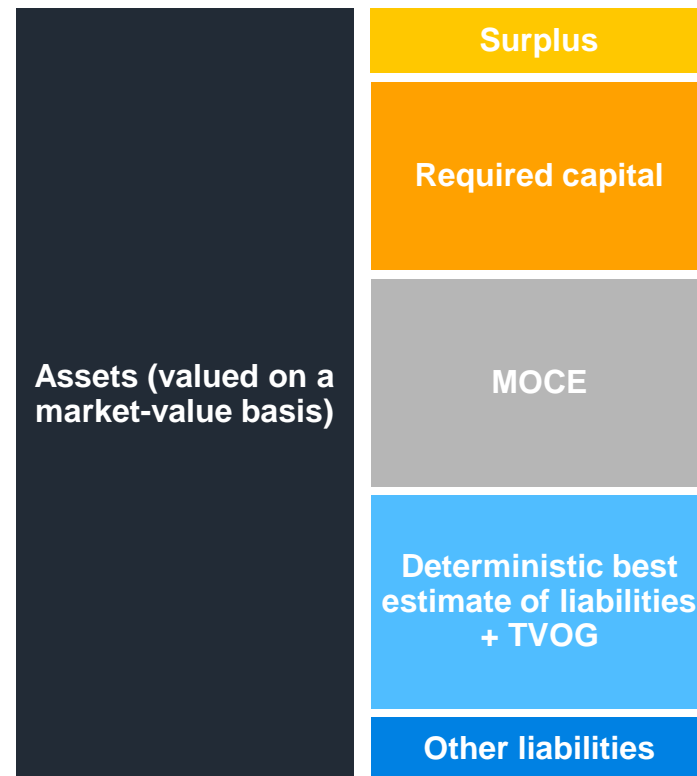


Source: Milliman research

# The importance of ALM under RBC

Key sources of volatility

## ICS Balance Sheet



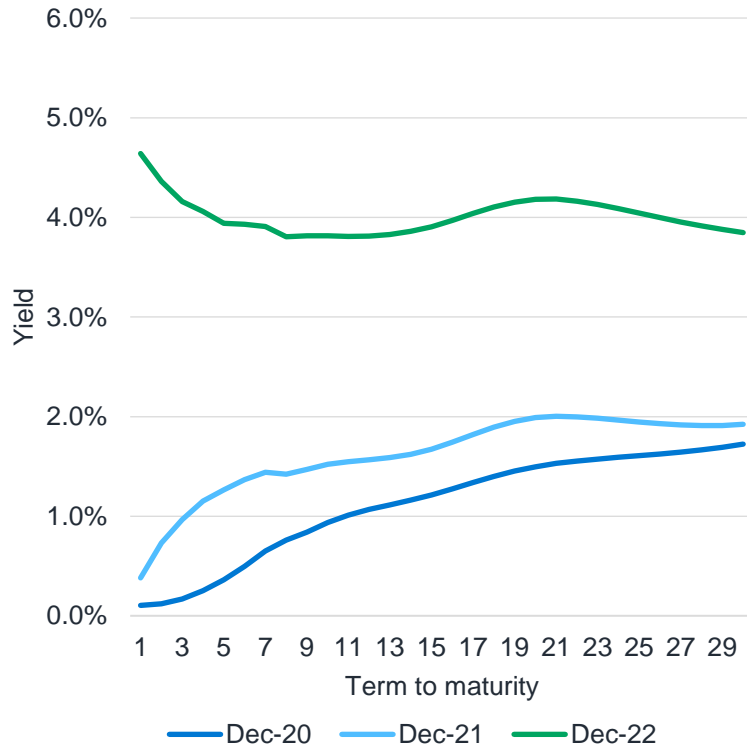
- Mismatch between market value of assets and fair value of liabilities, primarily due to:
  - ALM mismatch
  - Traditional underwriting risks (e.g. loss events and customer behavior) with impact on fair value of liabilities
  - Basis risk given the fair value of liabilities is not fully market consistent (e.g. construction of the risk discount rate, matching adjustment)
  - Presence of options and guarantees
  - Off-balance sheet exposures
- A large part of the capital volatility is typically explained by the interest rate risk.

# The importance of ALM under RBC

Hong Kong RBC – Interest rate risk as a potential key source of HKRBC volatility



**HKRBC USD yield curve**  
(no matching adjustment)



$$\Delta(\text{value}) \sim \text{duration} \times \Delta(\text{interest rate}) + \Delta(\text{duration}) \times \Delta(\text{interest rate})$$

**Duration:** Change in the value of an asset or a liability because of a parallel shift in the entire yield curve for 1%.

**Key-rate duration:** Change in the value of an asset or a liability because of 1% shift in the rate at a specific point on the yield curve, holding other points constant.

**A numerical example:**

**Total duration = sum of all key-rate durations**

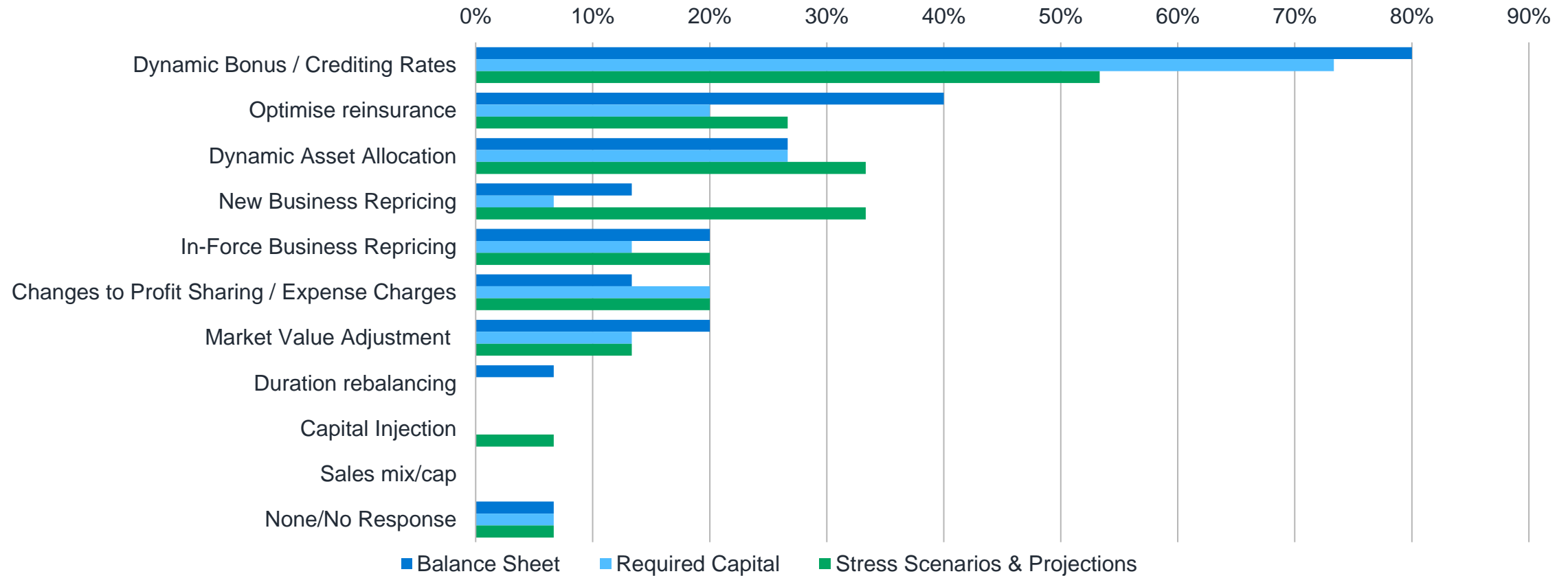
Key-rate durations	5y	12y	...	30y	...
Assets ("A")	4.5	1.7		0.4	
Liabilities ("L")	1.2	1.6		3.8	
Duration gap (= L less A)	3.3	-0.1		-3.4	
$\Delta$ in spot rate	-12bp	-25bp		-80bp	
% $\Delta$ in NAV/(asset /liabilities)	+0.40%	-0.03%	...	-2.72%	...

**Key-rate duration reveals "hidden" risks**



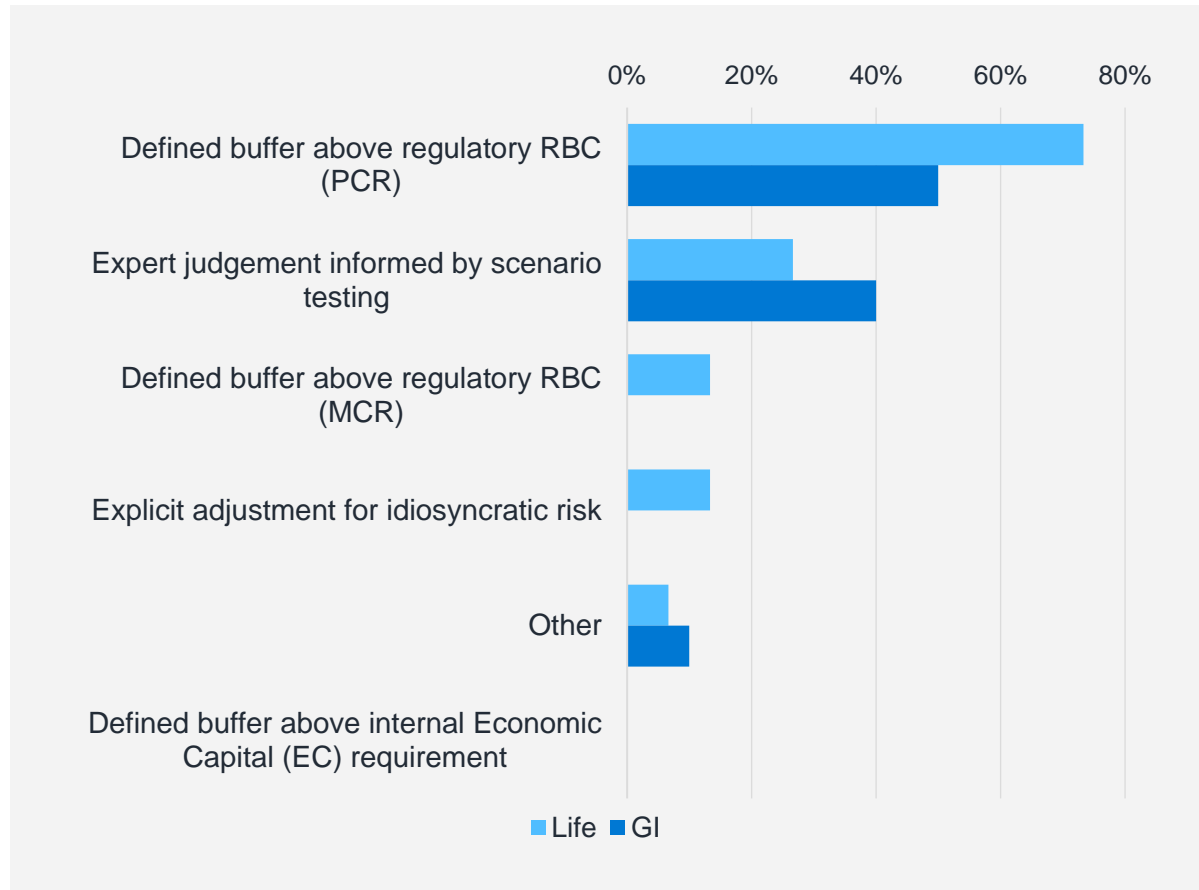
# Another direction to minimise volatility – modelled management actions

What management actions are modelled in the calculation of solvency results?



# Target Capital

New RBC rules → New Target Capital → New ORSA process



Source: Milliman research

## Companies will set the Target Capital based on the new RBC Regime

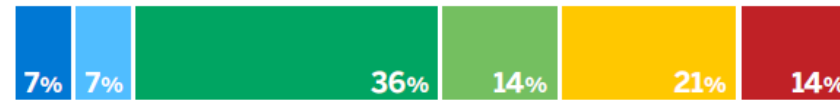
- Three quarters of life insurers and half of general insurers that responded set their Target Capital using a defined buffer above the regulator's Prescribed Capital Requirement (PCR) (for example, a buffer could be defined using a 1-in-10 stress scenario i.e. 1-year Value At Risk (VAR) approach).
- One quarter of life insurers that responded set Target Capital using a combination of stress testing with expert judgement. Several insurers indicate this approach is taken in addition to a defined buffer methodology.
- No insurer that responded uses their own internal Economic Capital model (which is consistent with insurers in other markets such as Singapore), but two insurers use the RBC basis and adjust for idiosyncratic risks that are specific to each insurer.
- It is observed most companies plan to set Target Capital based on a defined buffer method as this typically enables insurers to take a more systematic, consistent approach to setting Target Capital that adjusts for the external market conditions.

# Target Capital

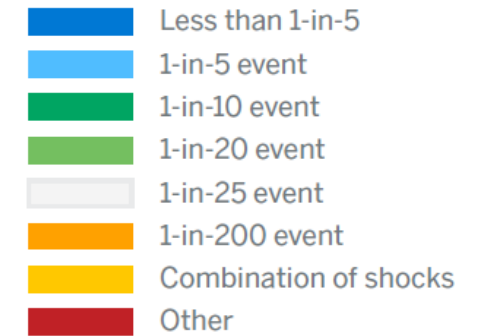
Outcome

Stress level used to calibrate the buffer

## Life insurers

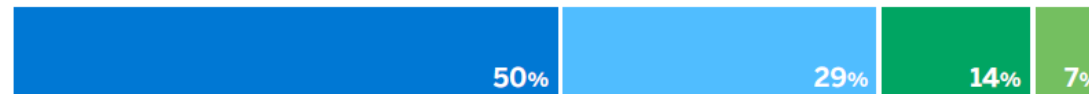


## General insurers

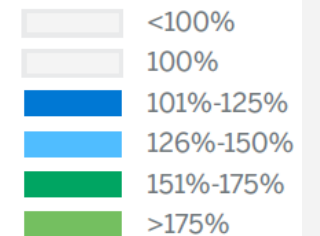


Target capital level

## Life insurers



## General insurers

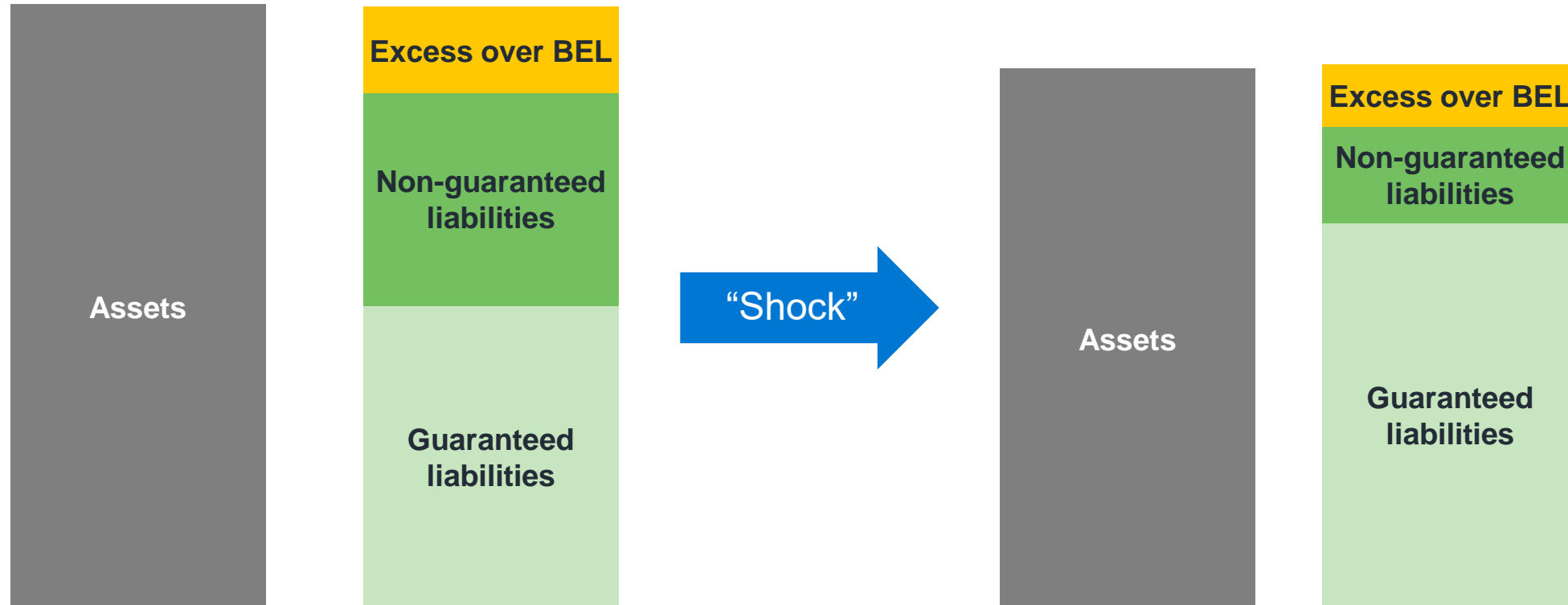


# Topical issue 3: Loss absorbency



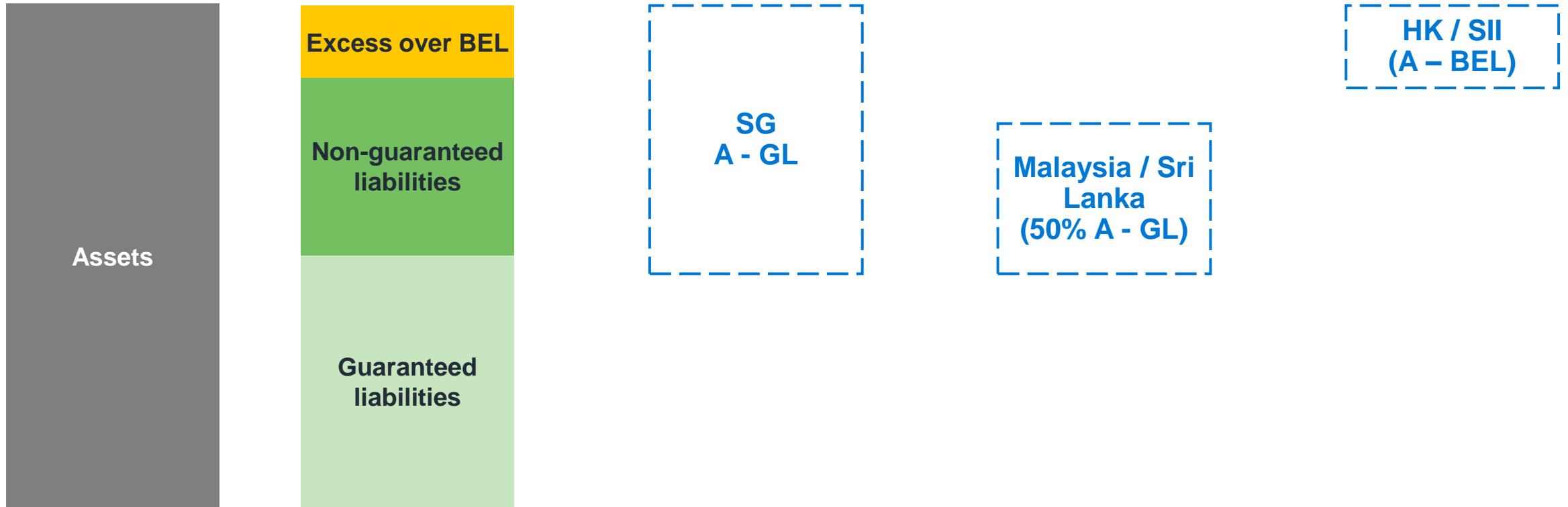
# Loss absorbency

Various approaches adopted across the region and the globe to capture participating business in RBC



# Loss absorbency

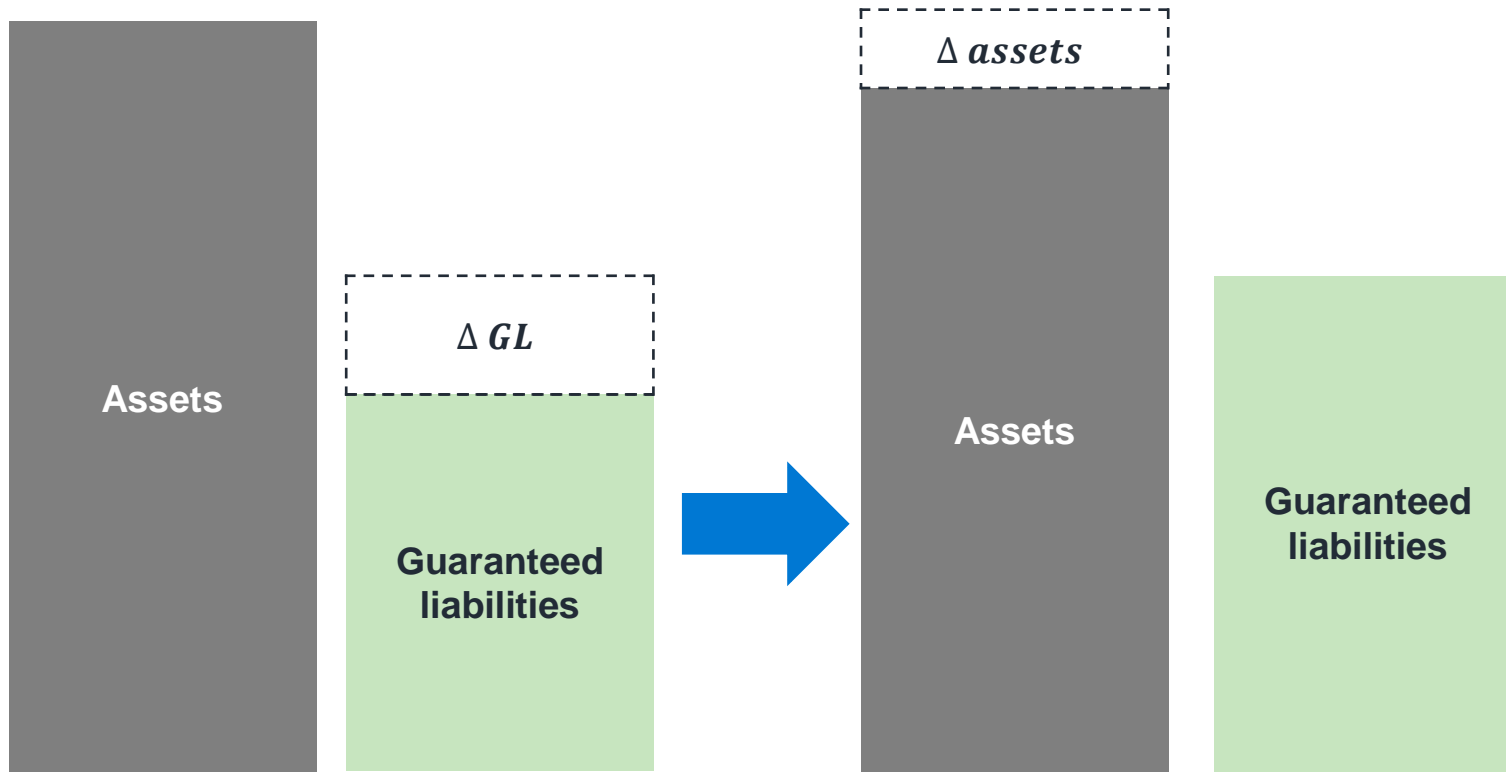
Available capital



# Loss absorbency

Various approaches adopted across the region and the globe

**SG**



**HK / SII**



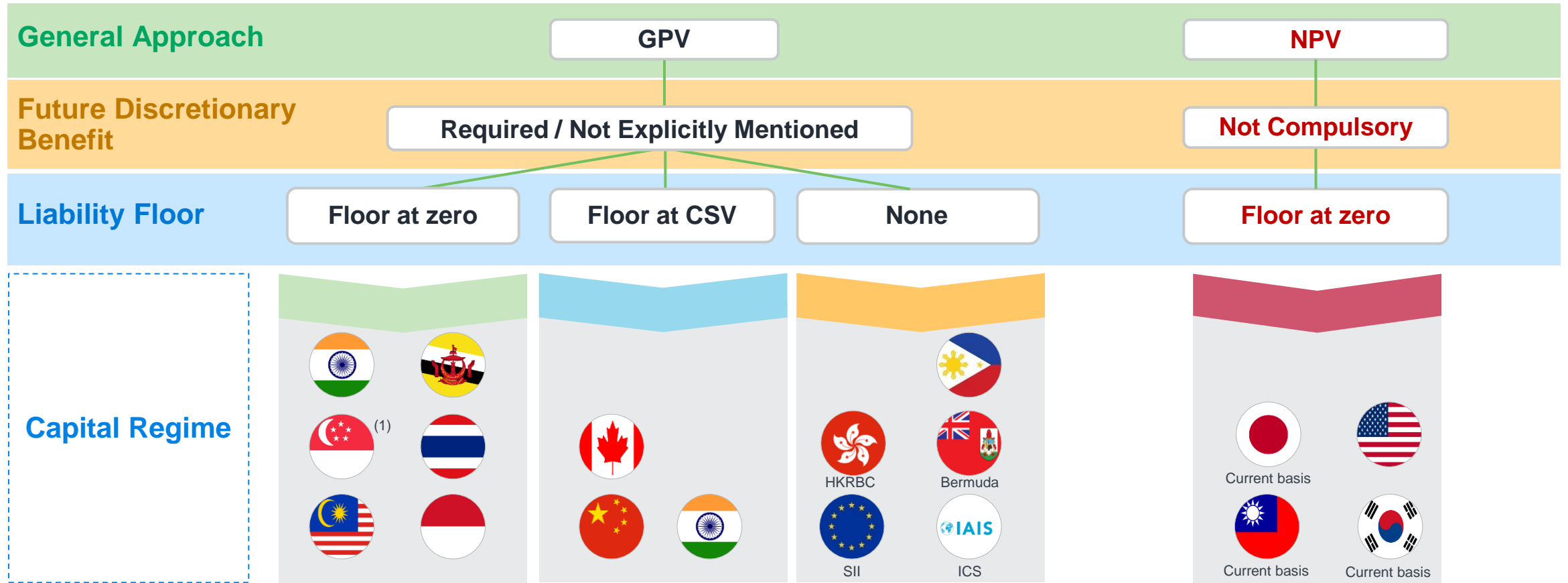
**Thank you**





# Liability valuation basis

Approach to evaluate deterministic insurance liabilities



Notes – 1. Negative reserves are available capital resources in Singapore

# Liability valuation basis

Risk margin – Comparison of market practices (life insurance risks)



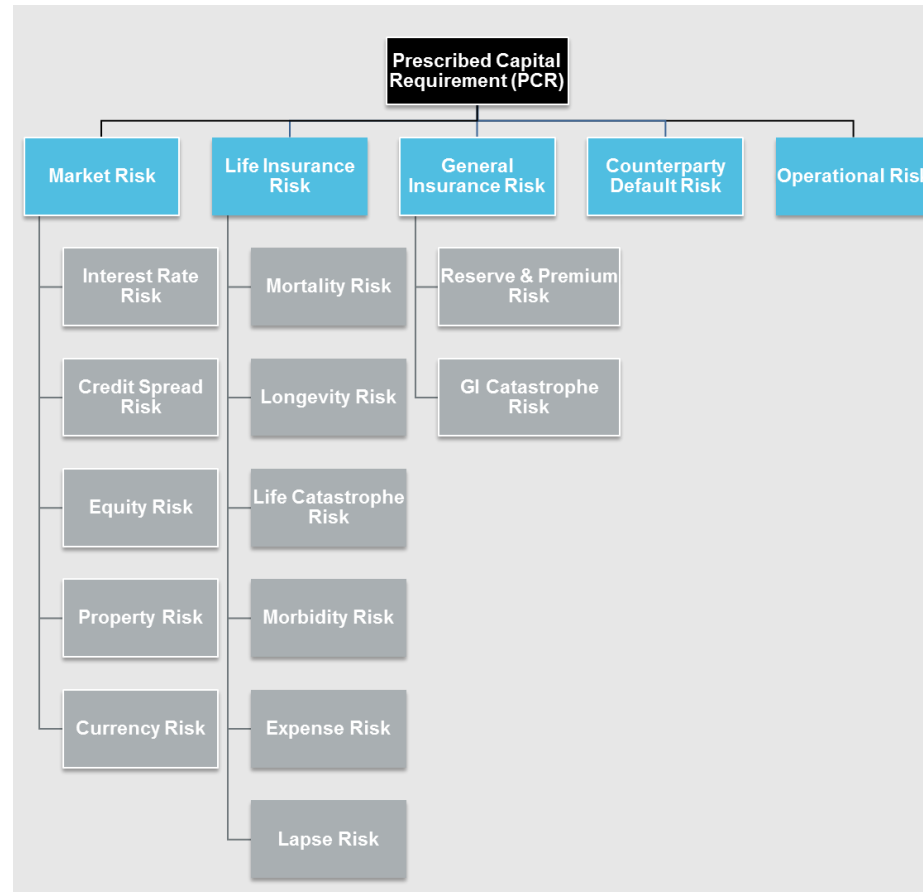
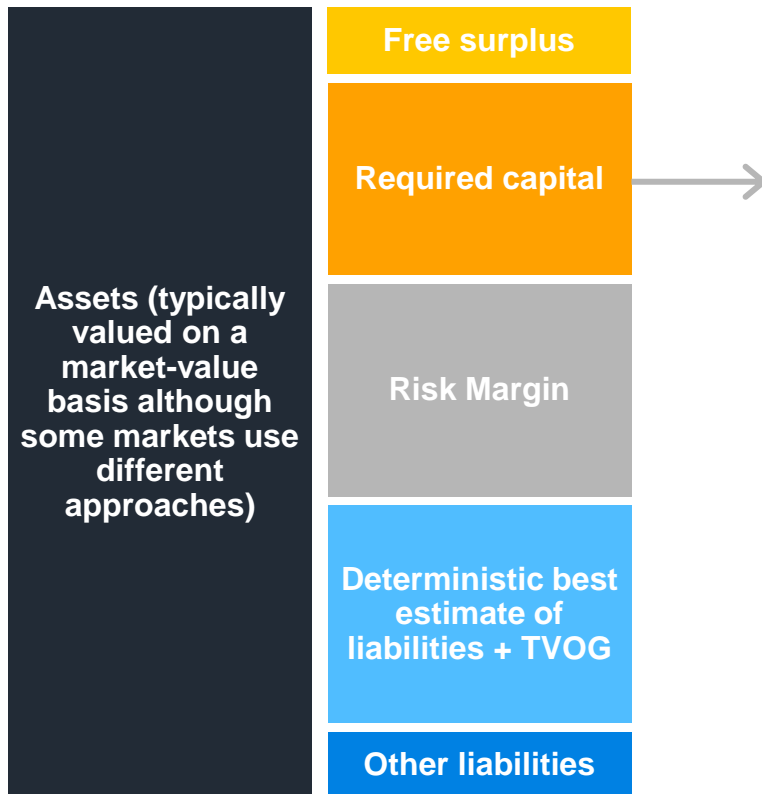
Capital regimes	Allowance for risk margin	Approach to assess risk margin
Brunei	✓	P-MOCE (75th percentile)
Japan (current)	Implicit margins	Implicit margins
Japan (ICS)	✓	P-MOCE (85 <sup>th</sup> percentile) (*)
China (C-Ross Phase II)	✓	P-MOCE (85 <sup>th</sup> percentile)
Hong Kong (Early Adoption)	✓	P-MOCE (75 <sup>th</sup> percentile)
India	✓	PAD (discretion)
Thailand	✓	PAD (75 <sup>th</sup> percentile)
Malaysia	✓	PAD (75 <sup>th</sup> percentile)
Singapore	✓	PAD (typically half of PCR stresses)
Indonesia	✓	PAD (75 <sup>th</sup> percentile)
Taiwan (current)	Implicit margins	Implicit margins
Taiwan (ICS)	✓	P-MOCE (85 <sup>th</sup> percentile)
South Korea (ICS)	✓	P-MOCE (85 <sup>th</sup> percentile)
Sri Lanka	✓	PAD

(\*) ongoing discussions to use the cost of capital approach

# Overview of a typical RBC framework

Typical “Solvency II-like” RBC framework

## ICS Balance Sheet



### Step 2

Aggregation of risk modules by correlation matrices

### Step 1

Aggregation of sub-risk modules by correlation matrices