Solvency frameworks in Hong Kong and Singapore

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Agenda

Recent capital regime updates

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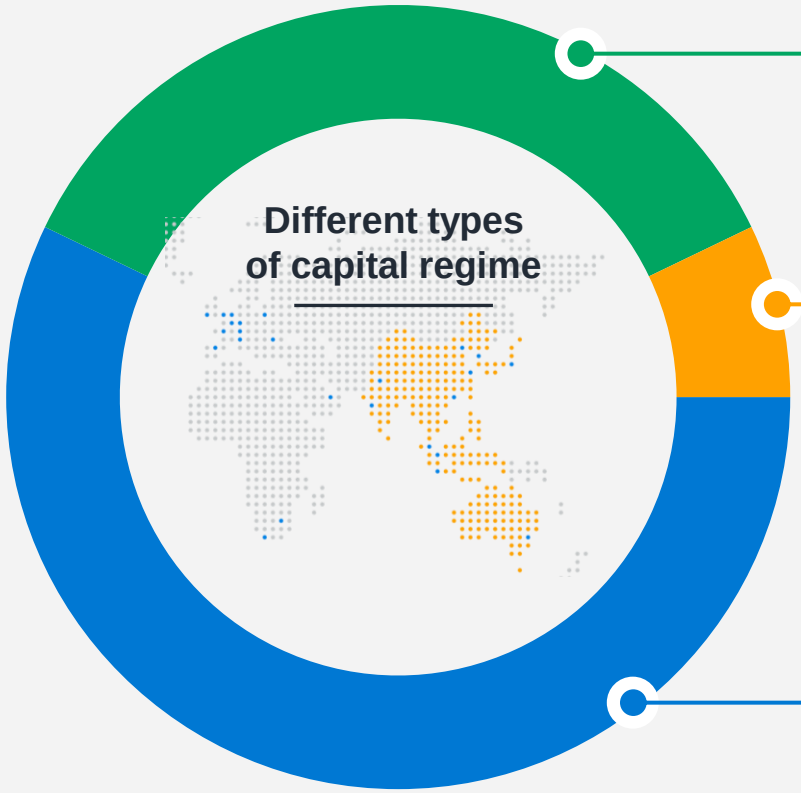
Recent capital regime updates across Asia

Overview of Asian capital regimes' developments



FACTOR-BASED

- India
- Vietnam

$$Capital = ax + by$$

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
- Hong Kong RBC
- Indonesia RBC
- Malaysia RBC
- Singapore RBC 2
- Thailand RBC 2
- South Korea K-ICS
- Taiwan T-ICS

Recent capital regime updates across Asia

Recent major developments of capital regimes

Hong Kong – RBC

major update

A Hong Kong RBC (Cap 41R) became effective for all insurers from July 2024, after three rounds of industry quantitative impact studies (QIS) and early-adoption of Hong Kong RBC (HKRBC) by some insurers.

China – C-ROSS

Some update

In September 2023, the NFRA announced a set of changes to the C-ROSS II rules, with the aim to further enhance the solvency monitoring standard for insurance companies in China. Additional changes might happen.

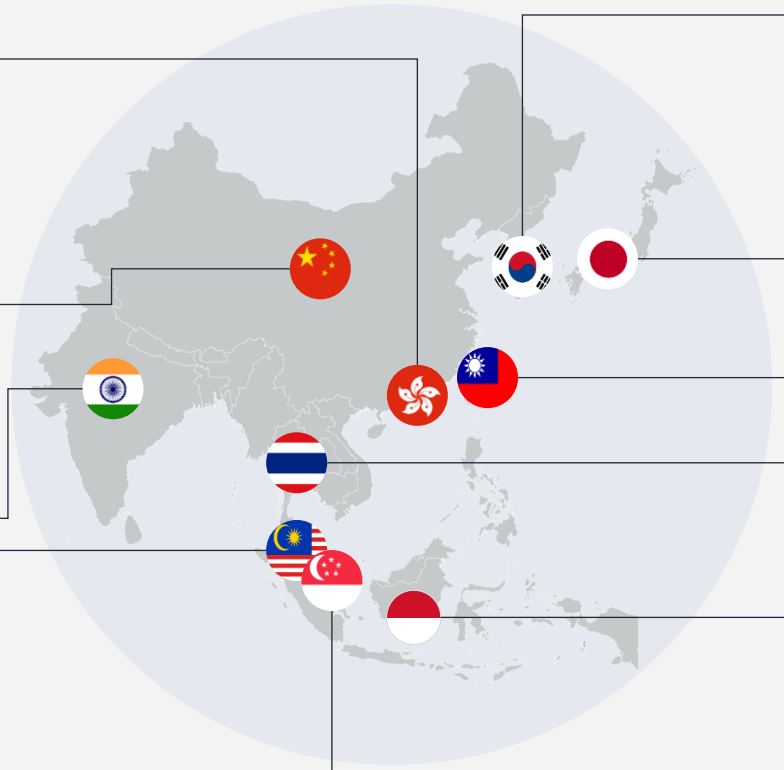
India

Future change expected

In 2023 the IRDA released the first quantitative impact study on RBC. The RBC framework is still under development and exact timeline is still uncertain

Malaysia – RBC

BNM released an exposure draft for the updated RBC framework in June 2024. Parallel reporting for the proposed RBC framework and full implementation are tentatively set to begin as early as 1 Jan 2026 and 1 Jan 2027 respectively.



South Korea – RBC

Major update

South Korea K-ICS is effective from January 2023

Japan

Major update

The FSA intends to introduce the new framework from 1 April 2025. The new regime is expected to be largely in line with ICS, but some elements are expected to be modified to reflect local market characteristics

Taiwan RBC

Major update

Taiwan is planning to adopt ICS with adjustments in 2026 as a step to move towards a full risk-based capital regime.

Thailand – RBC 2

No major update expected

Indonesia RBC

No major update expected

Singapore – RBC 2

No major update expected

Source: Milliman

International Capital Standard

Objective, timeline and scope of application

Objective: Establish a common language for supervisors to discuss solvency of Internationally Active Insurance Groups (“AIGs”) and to enhance global convergence of group capital standards

Timeline

Development

- 6 field tests (2014-17)
- 40-50 volunteer groups
- 3 public consultations
- ICS2.0 agreement Nov 2019

Monitoring Period

- Group supervisors monitor but no intervention actions
- Public consultation
- Consideration of Other Methods

Implementation of ICS as PCR

- Group supervisors implement ICS or alternative
- Assessment of group supervisors’ implementation

Scope of application: (i) internationally active insurance group + (ii) size (total assets are at least of USD 50 billion or Total gross premium are at least USD 10 billion).

ICS – overview – Executive Summary (bis.org)

Comparison of key capital resources components

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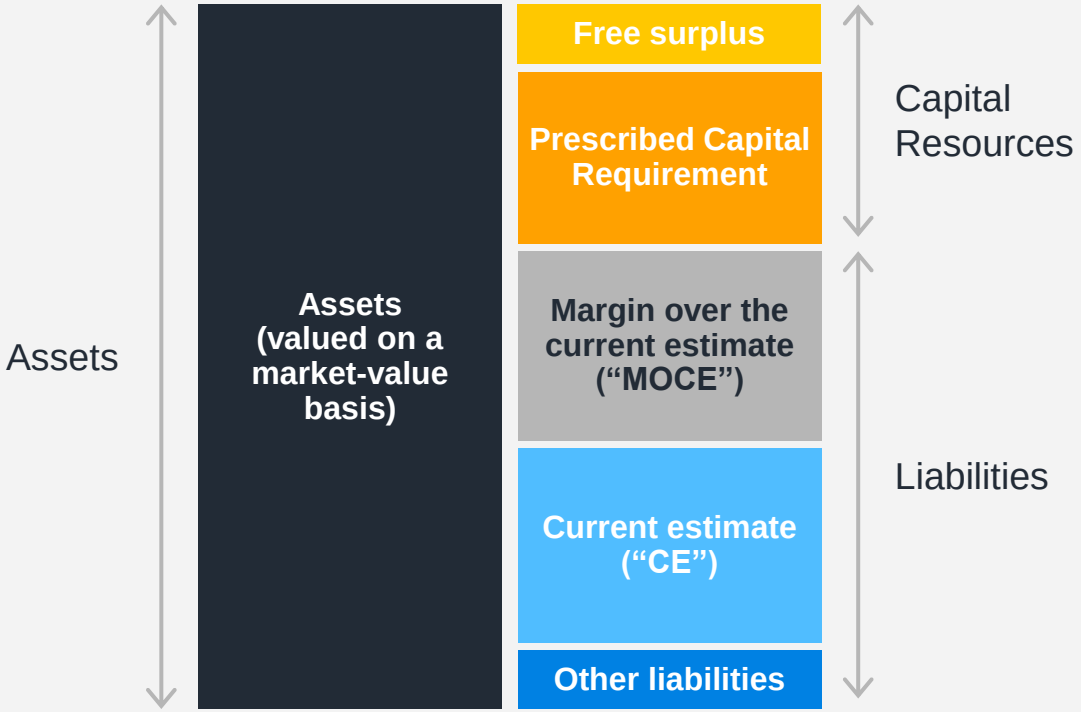
Overview of typical RBC balance sheet

ICS-liked balance sheet (e.g., Hong Kong RBC)

- Valuation of assets and liabilities on economic basis
- Required capital reflects all material risks of assets, liabilities, non-insurance risks and off-balance sheet items
- Qualifying capital resources
- Prescribed Capital Requirement calculated using a 1-year value-at-risk measure, typically calibrated to 99.5th percentile.

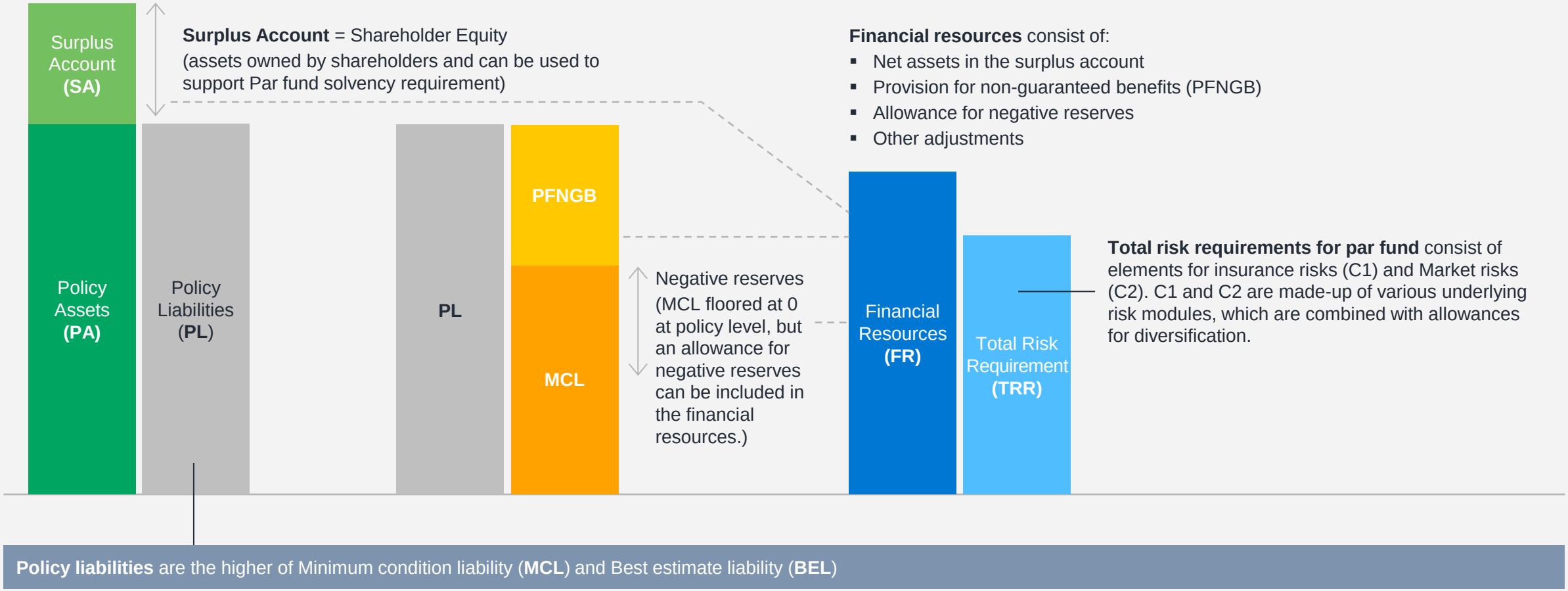
ICS Balance Sheet



Note: The above is a simplified view of the balance sheet.

Overview of typical RBC balance sheet

Singapore RBC balance sheet (participating business)



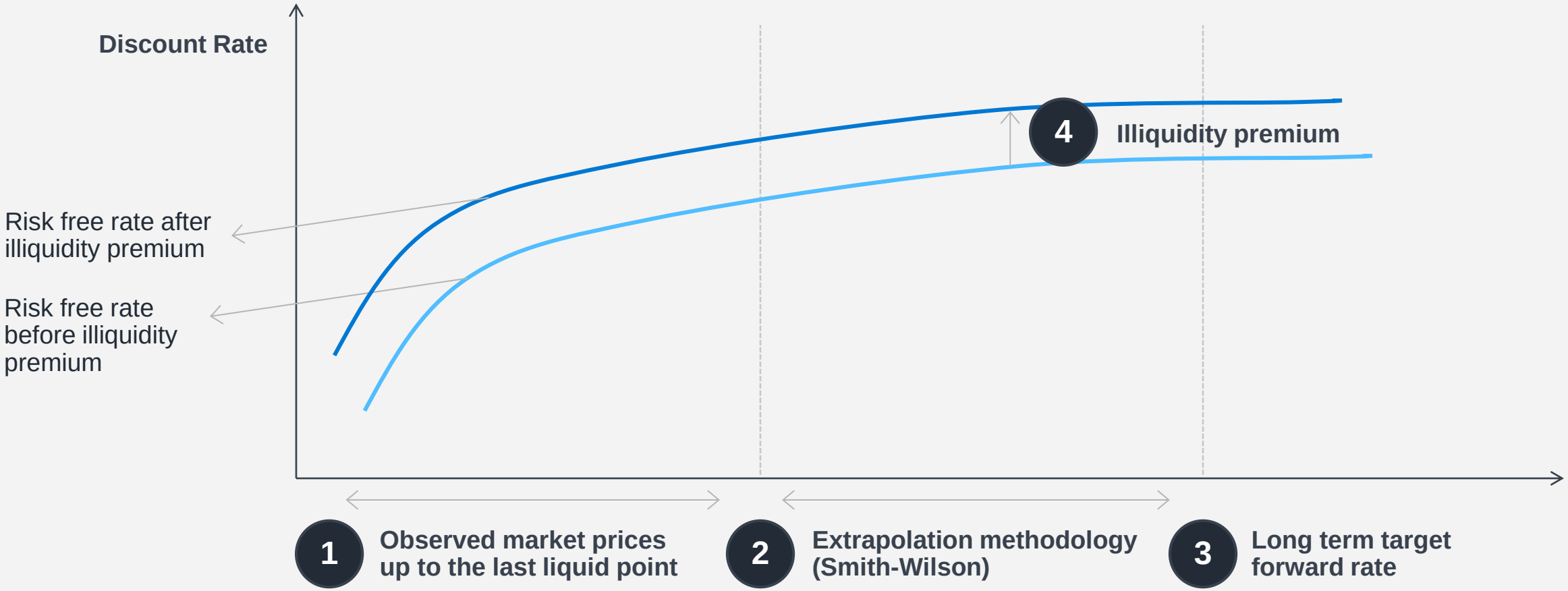
Overview of typical RBC balance sheet

Participating business - Singapore RBC2 vs HK RBC

HK RBC	SG RBC2
Stochastic valuation of liabilities with dynamic management actions (bonus rates). Market-consistent investment return and discount rate, with allowance for illiquidity premium Risk requirements allow for loss-absorbency Includes TVOG	Deterministic valuation of liabilities, taking higher of: • Guarantee reserve (“MCL”), discounted at risk-free with allowance for illiquidity premium; • BEL including future non-guaranteed benefits, discounted at a best-estimate investment return; • Policy assets 100% of the difference between policy assets and MCL are recognized as financial resources Risk requirements make no allowance for loss-absorbency No allowance for time-value of options and guarantees (“TVOG”)

Liability valuation basis

Risk free rate – Construction (typical ICS-like approach)



Liability valuation basis

Risk free rate – HKRBC vs Singapore RBC2

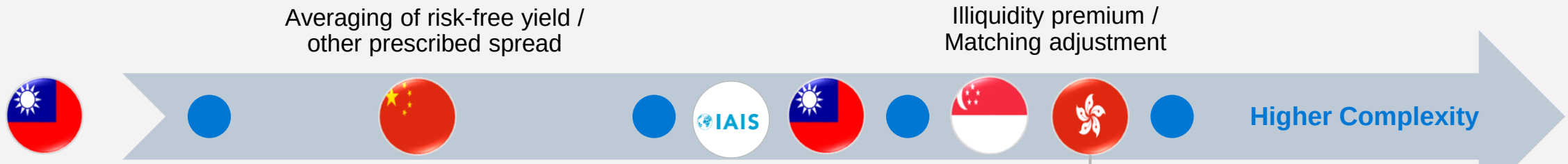
Category	Area	HKRBC	Singapore RBC2
Risk free yield curve	Reference yield	Government bond for USD, swap for HKD	Government bond
	Ultimate forward rate (“UFR”)	3.80% for USD	3.80% for both SGD and USD
	Last liquid point (“LLP”)	USD: 30 years, HKD: 15 years	20 years (SGD); 30 years (USD)
	Year of convergence	USD: 60 years, HKD: 60 years	60 years for both SGD and USD

Source: Milliman

Liability valuation basis

Illiquidity premium - Overview

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



Existing statutory basis: Based on interest rate filed at pricing (net premium valuation)

Three bucket approach

The degree of asset-liability cashflow matching will decide the “bucket” and the corresponding recognition of spread, which encourage insurance companies to perform better ALM

Matching adjustment tends to better incentivise asset and liability management (ALM).

Liability valuation basis

Illiquidity premium - HKRBC vs Singapore RBC2 (1/3)

	Hong Kong RBC	Singapore RBC2
Use of Illiquidity Premium	✘	✓
Use of Matching Adjustment	✓	✓
Key features for MA		
Eligible Products	▪ All products are eligible	▪ Non unit-linked products only
Product Currencies	▪ Any	▪ SGD and USD only
Cash Flow Matching	▪ No requirement, but allowed for via adjustment in calculation	▪ Annual shortfalls < 15% in aggregate
Predictability Test	▪ No requirement, but allowed for via adjustment in calculation	▪ Max 10/15% sensitivity for RP/SP
Applicability of MA	▪ Guaranteed & non-guaranteed cash flows	▪ Guaranteed cash flows only (Minimum condition liability or MCL)

Liability valuation basis

Illiquidity premium - HKRBC vs Singapore RBC2 (2/3)

	Hong Kong RBC	Singapore RBC2
Eligible Assets	▪ Wide range of eligible assets as specified by Regulation ▪ Equity and property cannot match, but can be used for long-term adjustment (“LTA”)	▪ Investment grade fixed interest assets and cash ▪ SGD and USD only. Haircut for currency mismatch with liabilities
Ring Fencing Requirements	▪ No ring fencing required except for LTA	▪ No legal ring fencing required, but must be identified and managed separately
Term	▪ Applicable for the whole duration of cash flows	▪ MA is applied in full up to the LLP, then graded to 10bps from year 10 after the LLP onwards
Regulatory Approval Required	▪ No prior approval required	▪ Written approval from MAS required
Impact on Credit Spread Risk Charge	▪ Liability offset to asset stress to reflect impact of MA increasing	▪ Liability offset to asset stress to reflect impact of MA increasing

Liability valuation basis

Illiquidity premium - HKRBC vs Singapore RBC2 (3/3)

	Calculation of MA
Hong Kong RBC	$MA = Adjusted\ Spread \times Predictability\ Factor \times Duration\ factor$ (1) $+ Constant\ Prescribed\ Spread \times Predictability\ Factor \times$ $Max\ [Min(Prescribed\ Cap, Eligible\ Asset\ \% - \frac{Asset\ Dollar\ Duration}{Liability\ Dollar\ Duration}), 0]$ (2) $+ LTA \times equity\ and\ property\ proportion\ (for\ segregated\ MA\ portfolios\ only)$ (3) (1) Measures the cashflow shortfall between asset and liability cashflows (2) Asset dollar duration / Liability dollar duration (3) Additional 1% return for equity portion if managed separately for Universal life & Par ➔ "Dynamic MA" and "Stressed MA" under stressed scenarios are allowed, to capture the stressed return on fixed income assets and ALM dynamics more accurately.
Singapore RBC2	$\boldsymbol{IRR(Eligible\ asset\ cashflows) - IRR(Guar.liability\ cashflows\ up\ to\ the\ longest\ asset\ cash\ flow) - adjustment\ for\ default\ \&\ downgrade\ of\ fixed\ income\ assets}$ ➔ Floored at the IP (i.e., calculated MA cannot be less than the IP would be) ➔ IRRs include adjustments for rolling forward excess asset cash flows and impact of haircuts for currency mismatch

Liability valuation basis

Time value of options and guarantees (TVOG) and Management Actions

Capital regimes	Allowance for TVOG	Approach to assess TVOG	Future Discretionary Benefits
Hong Kong	✓	Stochastic	✓
Singapore	✗	Not appropriate	✗ (MCL)
Other regimes for reference			
ICS	✓	Stochastic	✓
China (C-Ross II)	✓	Deterministic	✓
South Korea (K-ICS) / Japan ESR / Taiwan ICS	✓	Stochastic	✓
Thailand	✗	Not appropriate	✗

Liability valuation basis

Margin Over Current Estimate (MOCE)

Approach 1	Approach 2	Approach 3
Margin Over current estimate (“MOCE”)	**Provision for adverse deviation (“PAD”)**	**Cost of capital (“CoC”)**
▪ Typically calculated assuming the underlying non-hedgeable risks follow a normal distribution such that the MOCE can be derived based on the ratio between the the required capital (99.5th percentile) and the MOCE (75th or 85th percentile) ▪ Diversification across non-hedgeable risks is typically explicitly allowed for	▪ A provision for adverse deviation is added to the best estimate assumptions and the underlying reserve is therefore recalculated according to the PAD ▪ Several stress scenarios are typically considered concurrently (no explicit allowance for diversion across the various non-hedgeable risks)	▪ Based on an assumed cost of holding the underlying capital requirement for the non-hedgeable risks ▪ Diversification across non-hedgeable risks is typically explicitly allowed for ▪ Described as Risk Margin under Solvency II
▪ ICS ▪ **Hong Kong: 75th percentile**	▪ **Singapore: Typically, half of PCR stresses**	▪ Solvency II

Liability valuation basis

Other Key Features (non-exhaustive)

Liability Floor

- Hong Kong RBC: No liability floor
- Singapore RBC2:

Reserves at policy level floored to zero. For IL non-unit reserves, floor is at negative of surrender penalty applicable at time of valuation.

Negative reserves not recognized in balance sheet can be recognized as positive adjustment to financial resources, but after impact of insurance risk requirement stresses and do not count towards Tier 1 capital.

Comparison of key capital requirement components

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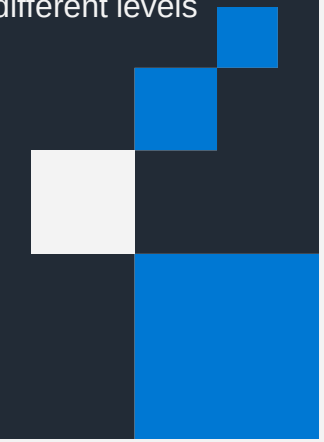
Required capital

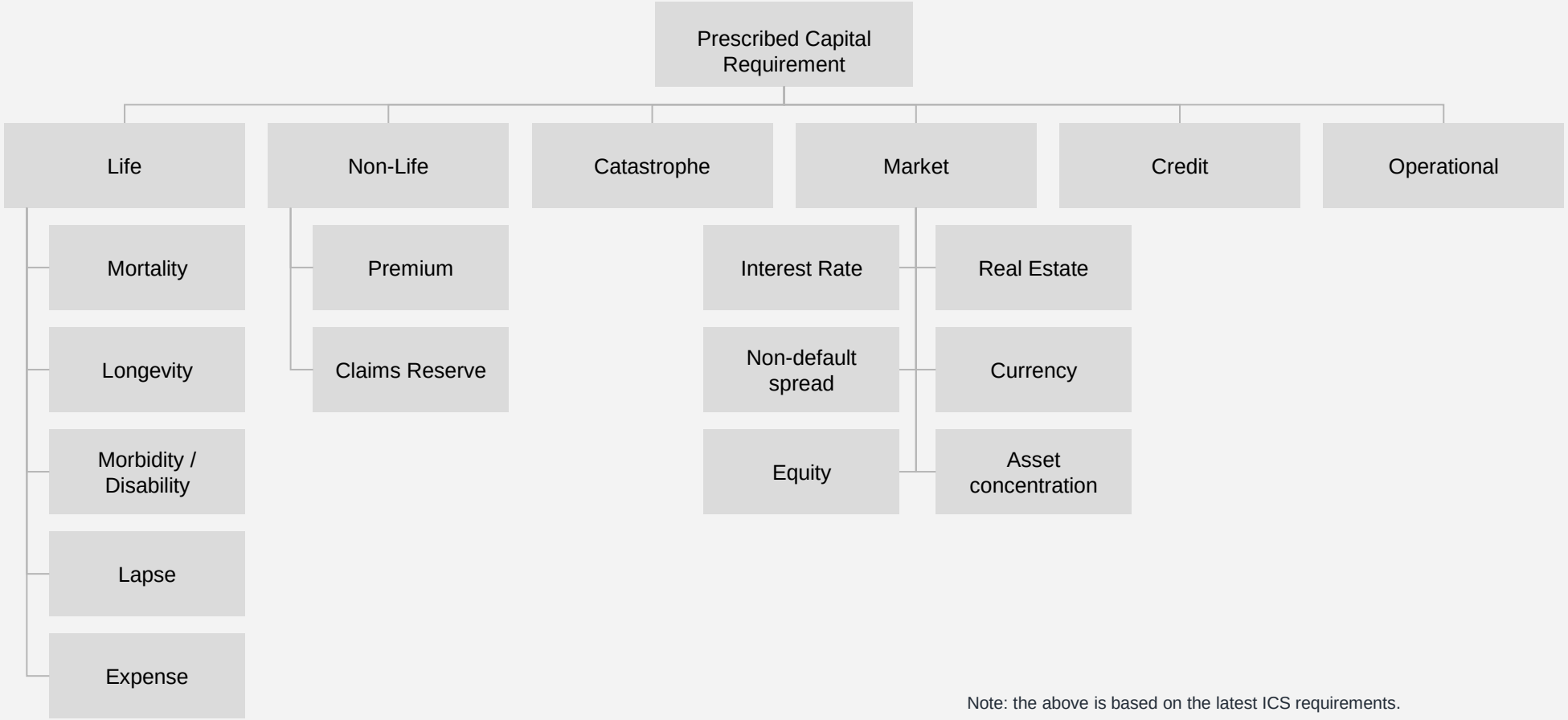
Overview of typical risks captured

Prescribed Capital Requirement captures all key risks

Risk modules broadly align between regimes although differences remain (e.g., catastrophe risk)

Diversification reflected at different levels

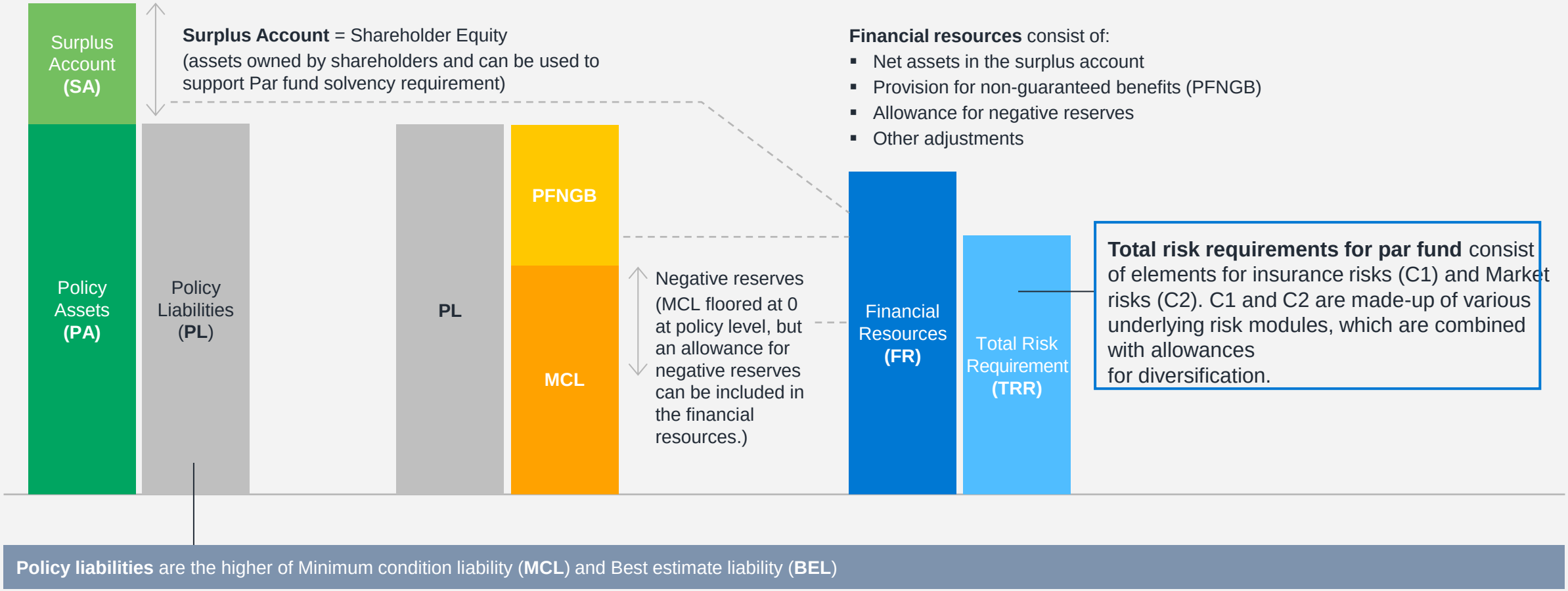




Note: the above is based on the latest ICS requirements.

Required capital

Recap: Singapore RBC balance sheet vs HK RBC balance sheet (participating business)



Required capital

Market risk – Interest rate risk

	Hong Kong RBC	Singapore RBC2
Methodology	Multiplicative shock subject to an absolute maximum adjustment	

Capital Regime	**Interest Rate/ALM, Stress-based Applies to Interest Rate**						
Term to Maturity	1	3	5	7	10	15	20
Hong Kong RBC [(b)]	-75%	-64%	-61%	-57%	-53%	-49%	-43%
Singapore RBC 2	-70%	-65%	-60%	-50%	-40%	-30%	-25%

Source: Milliman

Required capital

Market risk – Credit spread risk

	Hong Kong RBC	Singapore RBC2
Methodology	▪ Different spread adjustments is provided for different credit rating and tenor of bonds. Different spread adjustments is provided for different credit rating and tenor of bonds. Adjustments are additive to base spread. ▪ Assets (and any liabilities that use MA) are stressed to allow for impact of the adjustments and risk charge is based on the change in net assets under the stress, at MA portfolio level.	

Capital Regime	**Credit spread, stress-based applies to spread or otherwise as stated (unit: bps)**								
Credit Rating	**AAA**			**A**			**B**		
TTM	0 to 5	5 to 10	> 10	0 to 5	5 to 10	> 10	0 to 5	5 to 10	> 10
Hong Kong RBC	+95	+85	+75 to +55	+175	+145	+130 to +90	+640	+585	+530 to 365
Singapore RBC 2	+105	+95	+90	+165	+145	+125	+540	+500	+475

Source: Milliman

Required capital

Market risk – Equity risk

Capital Regime	Developed Listed	Emerging listed	Unlisted
Hong Kong RBC	40%	50%	50%
Singapore RBC 2	35%	50%	50%

Source: Milliman

Required capital

Non-market risk – Mortality and lapse risks

Capital Regime	Mortality/Longevity Applies to mortality rates or otherwise as stated	Lapse Applies to lapse rates or otherwise as stated
Hong Kong RBC	▪ +12.5% / -17.5%	▪ ±40% ▪ Mass lapse: 30% (individual); 50% (group) at time 0 ▪ Required capital for lapse is the maximum of lapse and mass lapse risk charge
Singapore RBC 2	▪ +20% / -25%	▪ ±50% ▪ Mass lapse: 30% (individual); 50% (group) at time 0 ▪ Required capital for lapse is the maximum of lapse and mass lapse risk charge

Source: Milliman

Required capital

Consideration of diversification / correlation matrix

Capital Regime	Overall	Within Life Insurance Risk	Within Market Risk
Hong Kong RBC	All components but operational	✓	✓
Singapore RBC 2	Between insurance, market and counterparty default risk	✓	✓

Source: Milliman

Key takeaways

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Thank you

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