

MILLIMAN RESEARCH REPORT

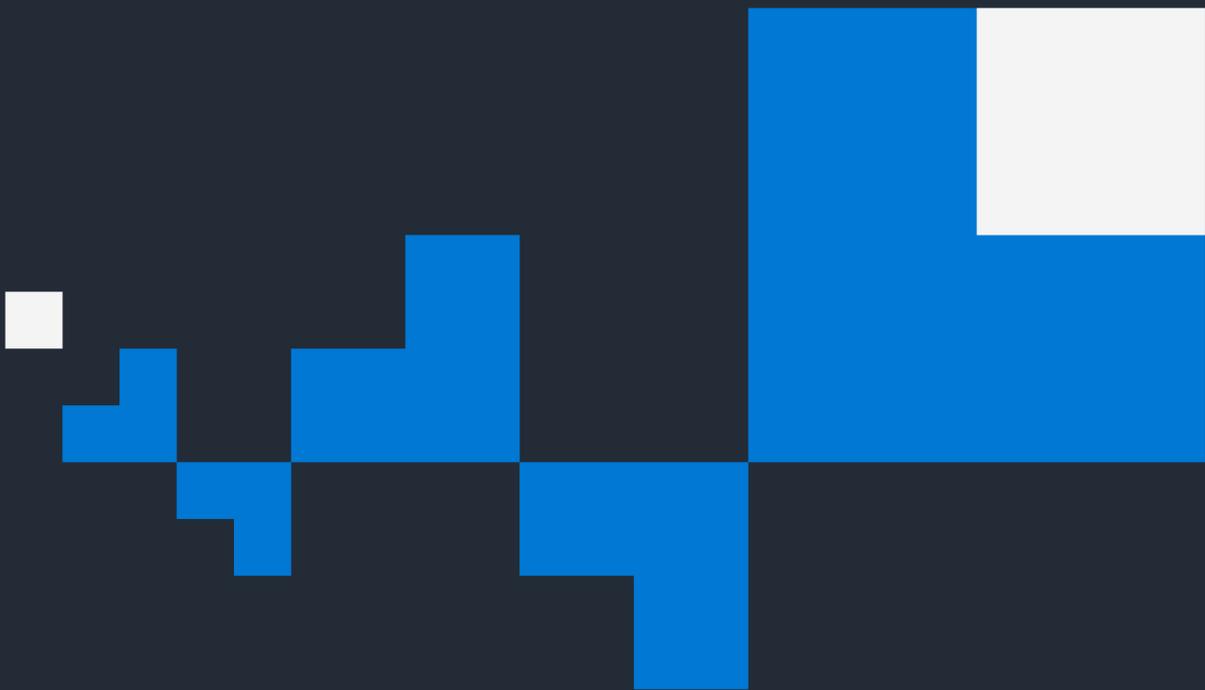
# Life insurance capital regimes in Asia

## Comparative analysis and implications of change

5<sup>th</sup> edition

Summary Report

August 2023



## Introduction

Capital regulations for life insurance companies in Asia are complex and varied. They are also subject to change, with such changes often affecting how insurers manage their business. In many markets in the region, regulators are 'upgrading' existing risk-based capital (RBC) frameworks, or are introducing RBC regimes for the first time, with increasing consideration being given to consistency with the new International Financial Reporting Standard 17 (IFRS 17), International Capital Standards (ICS) and other capital regimes worldwide.

This is the 5<sup>th</sup> edition of the Milliman Capital Regimes report, which covers the existing or upcoming capital regimes in 14 markets in Asia plus ICS and the Bermuda Solvency Capital Requirements (BSCR). The report also makes reference to Solvency II, Canada's Life Insurance Capital Adequacy Test (LICAT) and the United States' RBC regime (US RBC).

Our report aims to:

- i) Compare and contrast life insurance RBC regimes across selected Asian markets
- ii) Highlight some of the potential implications for life insurers arising from the future development of capital regulations
- iii) Contribute to the wider discussion on the potential impact of changes in regulation on the life insurance industry in Asia

In line with our reports from previous years, this report seeks to provide a comparison of key quantitative and qualitative aspects of life insurance capital regimes in Asia and to show analysis of key capital results (e.g., capital ratio, risk charges, factors affecting capital) based on information publicly available and from other market sources. It does not attempt to provide all the applicable details behind the capital regulations governing life insurance companies in the various markets analysed. It is important to recognise that the regulatory environment in Asia is changing fast and, consequently, the information contained in this report is time-sensitive. The various capital regimes covered in this report are based on the applicable regulatory environment as at 31 May 2023. Some of these regulations may have changed since this date.

We have produced an executive summary of the full report, which we are sharing here. If you would like to request a copy of the full report or discuss the capital frameworks in any of the markets covered in this report in more detail, please contact one of the Milliman consultants listed at the end of the report.

# Executive Summary

## OVERVIEW

Most insurance markets in Asia follow some form of RBC regime, although some of them, including Hong Kong, India, Vietnam and Brunei, are still currently using an EU Solvency I type of approach. In some markets, insurance regulators are reviewing the existing capital regulations, with the new rules being effective in 2024 for Hong Kong (although some companies have already early-adopted the new RBC regime), in 2025 for Japan and in 2026 for Taiwan.<sup>1</sup> Malaysia is also looking to “upgrade” its existing RBC requirements, while updates to the regime in Thailand are still under discussion. As of January 2023 South Korea has implemented K-ICS, an economic value-based capital framework similar to ICS. In China the CBIRC unveiled the new rules of C-ROSS Phase II on 30 December 2021. These have been used for solvency reporting from 2022 although a transition period is allowed, with full implementation expected by 2025. Figure 1 provides an overview of the current status of capital regimes for the markets covered in this report.

**FIGURE 1: STATUS OF THE CAPITAL REGIMES ACROSS ASIA**

MARKET	INSURANCE REGULATORY/ GOVERNING BODY	EXISTING CAPITAL REGIME / APPROACH	DEVELOPMENTS
<b>BRUNEI RBCS</b>	Brunei Darussalam Central Bank (BDCB)	EU Solvency I Not risk-based	RBC framework is to be incorporated in the near future. Parallel runs have been conducted in 2020 and 2021.
<b>CHINA C-ROSS PHASE II</b>	China Banking and Insurance Regulatory Commission (CBIRC)	C-ROSS Phase II Risk-based	On 30 December 2021, the CBIRC unveiled the new rules of C-ROSS Phase II. Insurers were required to prepare their 1Q22 solvency reports based on the C-ROSS Phase II regime. A transition period allows insurers to comply with some of the rules in stages before full implementation of the new regime by 2025 at the latest.
<b>HONG KONG RBC (EARLY ADOPTION)</b>	Hong Kong Insurance Authority (IA)	EU Solvency I Not risk-based	Hong Kong is introducing an RBC framework, which is expected to be effective for all insurers in 2024 (depending on the time spent on the subsidiary legislation process). The primary legislation was passed in July 2023). There have been three rounds of industry quantitative impact studies (QIS) to date plus more voluntary studies on different refined approaches. The IA released the latest set of technical specifications (referred to as the “Early Adoption Spec”) in 2021, which forms the basis for RBC reporting if insurance companies are approved to early-adopt the HKRBC regime, as well as for companies to perform stress and scenario testing (SST) as part of the Own Risk and Solvency Assessment (ORSA) requirements.
<b>JAPAN (REGULATORY)</b>	Financial Services Agency (FSA)	Risk-based (US risk-based)	The FSA intends to introduce an economic value-based solvency regime (ESR) from 1 April 2025 with first disclosure in March 2026. The new regime is expected to be largely in line with the Insurance Capital Standard (ICS), but some elements are expected to be modified to reflect local market characteristics, including the Margin on Current Estimate (MOCE) reverting back to the cost-of-capital approach and use of risk factors different from ICS. The FSA has been analysing the results of field tests and consulting with insurers on technical aspects of the proposed rules. The FSA issued a paper on 30 June 2023 with a status update on these issues. It is possible that further changes to the requirements may be forthcoming.
<b>INDIA SOLVENCY I</b>	Insurance Regulatory and Development Authority of India (IRDAI)	EU Solvency I Not risk-based	The IRDAI is contemplating the introduction of an RBC regime. However, the exact framework to be adopted has yet to be defined and the timing of implementation remains uncertain. We understand that the IRDAI will be releasing a quantitative impact study in Q3 2023, which will outline a proposed framework.
<b>INDONESIA RBC</b>	Otoritas Jasa Keuangan (OJK)	Risk-based	There has been developing discussions reported by local news that the OJK will raise the minimum capital requirement for insurance and reinsurance companies. The increase is scheduled to be implemented in two stages, the first in 2026 and the second in 2028. No official drafts have been released by the OJK regarding this subject.

<sup>1</sup> For Hong Kong, Japan ESR, Taiwan ICS and ICS the final rules may differ from the methodologies that are currently undergoing field testing (Japan ESR, Taiwan ICS and ICS) or have been early-adopted by some companies in Hong Kong. Broadly, this report summarises the draft methodologies based on information available as at 31 May 2023 but some later updates are also included for T-ICS and ICS.

MARKET	INSURANCE REGULATORY/ GOVERNING BODY	EXISTING CAPITAL REGIME / APPROACH	DEVELOPMENTS
<b>MALAYSIA RBC</b>	Bank Negara Malaysia (BNM)	Risk-based	BNM has initiated a review of its current RBC framework. An exposure draft for the updated RBC was initially expected to be released in 2022, followed by a parallel run of the new draft framework in 2023 and subsequently the potential implementation of the new RBC framework in 2024 at the earliest (subject to the results of the parallel run). However, we understand that there has been a delay in the timelines. The revised timelines have not yet been announced by BNM, and as of June 2023, the exposure draft of the updated RBC framework has not yet been released. Quantitative impact studies on the proposed new framework have been ongoing since 2021.
<b>PHILIPPINES RBC 2</b>	Insurance Commission (IC)	Risk-based	We understand there are no material planned developments to the current RBC framework expected in the near term.
<b>SINGAPORE RBC 2</b>	Monetary Authority of Singapore (MAS)	Risk-based	We understand there are no material developments although MAS is considering an allowance for countercyclical buffers within the existing RBC 2 framework.
<b>SOUTH KOREA K-ICS</b>	Financial Supervisory Service (FSS)	Risk-based	K-ICS, an economic value-based capital framework similar to ICS, has been adopted as of January 2023. There have been nine rounds of QIS to date, and official comprehensive guidelines from the FSS were released in December 2022.
<b>SRI LANKA RBC</b>	Insurance Regulatory Commission of Sri Lanka (IRCSL)	Risk-based	There may be some tightening of the capital requirements in the future, potentially leading to higher capital charges.
<b>TAIWAN CURRENT RBC</b>	Financial Supervisory Commission (FSC)	Risk-based (US risk-based)	The current RBC approach is based on prescribed risk factors multiplied by risk exposures. Going forward, Taiwan is set to move to an ICS-based regime, with the industry currently undergoing parallel testing. Taiwan ICS (T-ICS) is scheduled to come into effect on 1 January 2026. The regulator issued a statement in July 2023 that modifies some of the parameters used in T-ICS such that they are more Taiwan-specific compared to the underlying ICS on which T-ICS is based. We have used the moderated parameters in this report, except where stated otherwise.
<b>THAILAND RBC 2 (95<sup>TH</sup> PERCENTILE)</b>	Office of Insurance Commission (OIC)	Risk-based	The current Thailand RBC 2 framework is based on a 95 <sup>th</sup> percentile confidence level. It is understood that the OIC may plan to introduce a 99.5 <sup>th</sup> percentile confidence level framework two years after IFRS 17 is implemented in Thailand. It is also understood that the OIC is currently reviewing some of the parameters of the current RBC 2 regime (e.g., ALM capital requirement).
<b>VIETNAM</b>	Ministry of Finance (MOF)	EU Solvency I Not risk-based	The insurance regulator is contemplating the introduction of an RBC regime. A draft proposal of the Vietnam RBC framework was released in H2 2022 followed by a first quantitative impact study (QIS1). While QIS1 provided the industry with initial descriptions of the framework and initial basis for discussion, the exact framework to be adopted has yet to be defined, and the exact timeline is unclear at this stage.

### A move towards an economic balance sheet framework across the region, but material differences exist

Most of the solvency regimes across Asia have moved to an economic balance sheet framework, with an objective to assess assets and liabilities on a fair-value basis, while the capital requirement typically follows a modular approach based on a company-specific assessment that is more sensitive to each insurer's risk profile. A fundamental premise of the economic balance sheet framework is the endorsement of the concept that assets and liabilities should be valued on a consistent economic basis, leading to a reduction or elimination, where possible, of accounting mismatches. This economic balance sheet approach is also typically consistent with that used under Solvency II, Insurance Capital Standard (ICS) and IFRS 17 principles, although differences exist. In particular, for solvency purposes, an increasing number of Asian capital regimes require companies to:

- Assess their assets on a market-value basis (e.g., Hong Kong's RBC framework, Indonesia, Singapore, Thailand, and Malaysia), although some markets are still measuring their assets using different accounting bases (e.g., for China's C-ROSS 2, Solvency I-like regimes such as Vietnam or India)

- Value their liabilities using a gross premium valuation (GPV) approach allowing for an additional risk margin (RM) and, potentially, a time value of options and guarantees (TVOG), using a fair value approach based on “relatively market-consistent” discount factors.

Although there is a trend towards the use of an economic balance sheet framework, markets are moving at different paces, and many regulators in Asia seem to have taken a more practical approach that reflects market specifics, while ensuring a reasonable degree of conservatism (e.g., the flooring of reserves in some markets, the lack of loss-absorbing capacity of reserves in others). This leads to inconsistencies between RBC regimes across the region. Figure 2 gives an overview of some of these differences when assessing liabilities.

FIGURE 2: APPROACH OF EVALUATING DETERMINISTIC INSURANCE LIABILITIES

CAPITAL REGIME	GENERAL		RISK MARGIN		TVOG	
	APPROACH	LIABILITY FLOOR	ALLOWED?	APPROACH	ALLOWED?	APPROACH
BRUNEI RBCS	GPV	Reserves floored to zero at policy level	✓	PAD	✗	None
CHINA C-ROSS (PHASE II)	GPV	CSV less capital requirement	✓	MOCE	✓	Deterministic only <sup>(b)</sup>
HONG KONG RBC (EARLY ADOPTION)	GPV	None	✓	MOCE	✓	Stochastic/deterministic
JAPAN (CURRENT)	NPV	Reserves floored to zero at policy level	✗	Considered implicitly	✓	Stochastic/deterministic
JAPAN ESR (FUTURE)	GPV	None	✓	MOCE	✓	Stochastic/deterministic
INDIA SOLVENCY I	GPV	CSV (if there is a surrender value) or reserves floored to zero at policy level	✓	PAD	✓	Not explicitly specified
INDONESIA RBC	GPV	Reserves floored to zero at policy level	✓	PAD	✗	N/A
MALAYSIA RBC	GPV	Reserves floored to zero at fund level	✓	PAD	✓	Stochastic/deterministic
PHILIPPINES RBC 2	GPV	None	✓	PAD	✗	N/A
SINGAPORE RBC 2	GPV	Reserves floored to zero at policy level <sup>(a)</sup>	✓	PAD	✗	N/A
SOUTH KOREA LEGACY RBC	NPV	Reserves floored to zero at policy level	✗	Considered implicitly	✓	Stochastic
SOUTH KOREA K-ICS	GPV	None	✓	MOCE	✓	Stochastic
SRI LANKA RBC	GPV	No floor for the liability. However, the sum of reserves and required capital should not be less than the total surrender value of policies	✓	PAD	✓	Stochastic/deterministic

CAPITAL REGIME	GENERAL		RISK MARGIN		TVOG	
	APPROACH	LIABILITY FLOOR	ALLOWED?	APPROACH	ALLOWED?	APPROACH
<b>TAIWAN CURRENT RBC</b>	NPV	Reserves floored to zero at product level	X	Considered implicitly	X	N/A
<b>TAIWAN T-ICS (FUTURE)</b>	GPV	None	✓	MOCE	✓	Stochastic/deterministic
<b>THAILAND RBC 2 (95<sup>TH</sup> PERCENTILE)</b>	GPV	Reserves floored to zero at product group level	✓	PAD	X	N/A
<b>VIETNAM SOLVENCY I</b>	NPV	None	X	Considered implicitly	X	N/A
<b>SOLVENCY II</b>	GPV	None	✓	CoC	✓	Stochastic
<b>BERMUDA BSCR</b>	GPV	None	✓	CoC	✓	Stochastic
<b>CANADA LICAT</b>	GPV	Cap on credit taken for negative reserves and if CSV greater than reserves	✓	PAD	X	N/A
<b>ICS</b>	GPV	None	✓	MOCE	✓	Stochastic/deterministic
<b>US RBC</b>	NPV	Reserves floored to zero at policy level	X	Considered implicitly	X	N/A

**Notes:**

GPV = Gross Premium Valuation, NPV = Net Premium Valuation, CSV = Cash Surrender Value, PAD = Provision for Adverse Deviation, CoC = Cost of Capital, MOCE = margin over current estimate

(a) Singapore RBC 2 regime continues to floor policy reserves to zero but recognises negative reserves as an increase to financial resources.

(b) Although C-ROSS Phase II uses deterministic factor approach to TVOG calculation, the factors only depend on the guaranteed interest rate while both remaining liability duration and guaranteed interest rate are considered in C-ROSS Phase I.

N/A: not appropriate

TVOG is a good example of such inconsistencies. Universal life products offering guarantees are prevalent in many markets in Asia including Hong Kong, Singapore, China and Vietnam, but TVOG is only included under Hong Kong RBC (early adoption) and China C-ROSS Phase II regimes. Under C-ROSS II, TVOG is assessed using a prescribed deterministic formula that applies to the whole industry, whereas the Hong Kong regulator is encouraging companies to assess TVOG using stochastic asset-liability management (ALM) models to better reflect their own costs of financial options and guarantees. The same discrepancies in TVOG methodology apply to participating business, which is material in many markets in Asia (e.g., Hong Kong, Singapore, Malaysia, China, India and Sri Lanka).

The risk margin is another example of discrepancies across RBC regimes in Asia. A provision for adverse deviation (PAD) approach or a MOCE approach (consistent with Insurance Capital Standard) are adopted in most of the capital regimes in the region. However, the approaches to derive the PADs differ between markets, for example in determining the underlying risk charges used to calculate the PADs, or selecting the percentile for the determination of the MOCE (e.g., 75<sup>th</sup> percentile under HK RBC, 85<sup>th</sup> percentile under South Korea ICS and China C-ROSS II). In addition, the PAD and MOCE approaches are not consistent with the cost of capital (CoC) approach used for Solvency II and Bermuda's BSCR, although we understand that the intention is for Japan ESR to use a cost of capital approach. Moreover, the risk margin methodologies may not be in line with the approaches adopted by some Asian life insurance companies under IFRS 17 (although some companies may also decide to use a PAD or MOCE approach) or for economic capital purposes.

### Discount rate: Market consistency and illiquidity premium/smoothing

Under RBC regimes, the discount rates used to assess the best estimate liability (BEL) are typically defined using a “bottom-up” approach, whereby the discount rate reflects a market-consistent risk-free rate plus an adjustment for illiquidity and smoothing prescribed by regulators. However, the valuation of liabilities requires the use of a yield curve that extends to very long durations, reflecting both market conditions and long-term economic views. This poses a challenge in Asia (and elsewhere) where available market data is often covering a much shorter duration than the projected cash flows. Therefore, the reference yield curve is typically extrapolated from the last liquid market point (LLP) to some long-term equilibrium rate, referred to as the ultimate forward rate (UFR). Figure 3 compares the parameters used by the various regimes considered in this report.

FIGURE 3: DETERMINATION OF THE DISCOUNT CURVE

CAPITAL REGIME	BASIC YIELD	ILLIQUIDITY PREMIUM/ SMOOTHING	LLP	UFR	INTERPOLATION/ EXTRAPOLATION
<b>BRUNEI RBCS</b>	Government bond yield curve (Singapore is used as a proxy)	N/A	20 years	3.8%	Smith-Wilson method
<b>CHINA C-ROSS (PHASE II)</b>	Government bond yield	30 / 45 / 75 bps depending on product and issue date  Use of 750-day moving average of government bond yield curve	20 years	4.5%	Quadratic
<b>HONG KONG RBC (EARLY ADOPTION)</b>	Government bond yield for US dollar (USD), swap for HKD	Matching adjustment (MA) with additional long-term adjustment (LTA) to equity and property under segregated participating/ universal life portfolios	HKD: 15 years USD: 30 years	HKD: 3.8% USD: 3.8%	Smith-Wilson method
<b>JAPAN (CURRENT)</b>	Stipulated interest rate for policies issued after March 1996, with some exceptions. Otherwise, the (guaranteed) interest rates filed with FSA upon product launch.				
<b>JAPAN ESR (FUTURE)</b>	Swap rate or government bond yield	Prescribed illiquidity premium (three-bucket approach)	JPY: 30 years USD: 30 years	JPY: 3.8% USD: 3.8%	Smith-Wilson method
<b>INDIA SOLVENCY I</b>	Best estimate investment return (net of PAD)	N/A, although risk-adjusted corporate bond spreads may be included in the best estimate investment return	N/A	N/A	N/A
<b>INDONESIA RBC</b>	Government bond yield	Past 12-month averaging of government bond yield plus a discretionary adjustment of up to 50 bps	N/A	N/A	N/A
<b>MALAYSIA RBC</b>	Government bond yield	N/A, yet volatility adjustment and MA are introduced in the latest draft exposure for liability valuation, which may be a change of direction	15 years	Same level as at LLP	Based on forward rate
<b>PHILIPPINES RBC 2</b>	Bloomberg PHP BVAL reference rate for PHP  Bloomberg international yield curve for USD	N/A	N/A	N/A	N/A
<b>SINGAPORE RBC 2</b>	Government bond yield	Allowance for illiquidity premium or MA	SGD: 20 years USD: 30 years	SGD: 3.8% USD: 3.8%	Smith-Wilson method
<b>SOUTH KOREA LEGACY RBC</b>	Assumed (guaranteed) interest rates filed with FSS at a product launch	N/A	N/A	N/A	N/A
<b>SOUTH KOREA K-ICS</b>	Government bond yield	Prescribed illiquidity premium	20 years	4.80%	Smith-Wilson method

CAPITAL REGIME	BASIC YIELD	ILLIQUIDITY PREMIUM/ SMOOTHING	LLP	UFR	INTERPOLATION/ EXTRAPOLATION
<b>SRI LANKA RBC</b>	Government bond yield curve as specified by IRCSL	N/A	10 years	Same as the spot rate at the LLP	N/A
<b>TAIWAN CURRENT RBC</b>	US government bond yield	N/A	N/A	N/A	N/A
<b>TAIWAN T-ICS (FUTURE)</b>	Swap rate or government bond yield	Prescribed illiquidity premium (three-bucket approach)	TWD: 10 years USD: 30 years	TWD: 4.4% USD: 3.8%	Smith-Wilson method
<b>THAILAND RBC 2 (95TH PERCENTILE)</b>	Government bond yield	Averaging of government bond yield	50 years	Same level as at LLP	N/A
<b>VIETNAM SOLVENCY I</b>	Government bond yield	For NPV reserve calculation, the maximum valuation interest rate allowable has been revised to be 80% of the simple average interest rate of long-term government bonds (with terms of 10 years or greater) issued in the last 24 months.	N/A	N/A	N/A
<b>SOLVENCY II</b>	Swap rate or government bond yield	Volatility adjustment or MA	Euro: 20 years USD: 50 years	Euro and USD: 3.45% (2022) 3.45% (2023)	Smith-Wilson method
<b>ICS</b>	Swap rate or government bond yield	Prescribed illiquidity premium (three-bucket approach)	CNY: 10 years EUR: 20 years JPY: 30 years KRW: 20 years TWD: 10 years USD: 30 years	CNY: 6.0% EUR: 3.8% JPY: 3.8% KRW: 4.4% TWD: 4.4% USD: 3.8%	Smith-Wilson method

Given the long-term nature of many life insurance contracts, life insurers typically require long-term assets to match their liabilities. Where those liabilities are “illiquid”, such that they have relatively predictable cash flow profiles, insurers can invest in such a manner that recognises that a forced sale of assets, in most cases, would not be required. The insurers can then potentially benefit from the risk premium that can be available to long-term investors, typically called an illiquidity premium. Furthermore, insurers are typically not exposed to short-term fluctuations in the price of assets, albeit the insurer is exposed to changes in the fundamental value of the cash flows on the assets, for example an increased probability of defaults. Illiquidity premium adjustments and smoothing adjustments (e.g., volatility adjustment, UFR, averaging of spot yield curve) are, therefore, applied in the discount rate to reduce the short-term economic balance sheet volatility, stabilise the net asset value (i.e., difference between fair value of assets and liabilities) and better reflect the long-term nature of insurance businesses, in particular the illiquid nature of liabilities. Illiquidity premiums and smoothing adjustments are common under RBC frameworks and typically act as countercyclical measures in order to reduce the sensitivity of the economic balance sheet to the discount rate. The prescribed approach and complexity vary across regimes, from a historical averaging of risk-free yield or other prescribed spread (e.g. China C-ROSS II, Thailand RBC 2, Indonesia RBC) to a more complex matching adjustment mechanism (e.g. Singapore RBC 2 or Hong Kong RBC).

With IFRS 17, this topic has also become increasingly important as insurance companies need to reflect the characteristics of the liability cash flows when setting the IFRS 17 discount rate, and in particular the level of liquidity.

## Capital requirement modules and submodules are broadly consistent across RBC regimes in Asia, but underlying parameters differ

The risks considered in determining life risk capital requirements vary across different capital regimes. However, key risks considered are typically similar, and include insurance risk, market risk, counterparty default risk and operational risk.

- Insurance risk includes mortality risk, longevity risk, morbidity risk, lapse risk (long-term and mass lapse) and expense risk. Mortality catastrophe risk is also sometimes explicitly considered while a separate surrender risk charge is sometimes explicitly captured if mass lapse is not included.
- Market risk typically consists of equity risk, interest rate risk or ALM risk, credit spread risk, property risk and foreign exchange risk. (Note that equity volatility and interest rate volatility risk are typically not considered within RBC regimes in Asia.)
- Operational risk is normally quantified by applying risk factors to risk drivers, with premiums being one of the most common risk drivers.

As there are natural hedges between different risks, correlation matrices are usually considered to reflect diversification benefits across various risk modules and sub-modules. Most of the RBC regimes in Asia (and in particular all of the RBC regimes revised recently) consider diversification benefits when aggregating the sub-modules under the insurance and market risk modules. Some RBC regimes consider diversification between all risk components other than operational risk, while some others only consider diversification between asset risk and insurance risk.

There is generally a trend towards making risk charge parameters and stress factors more consistent from one regime to another, to the extent possible. However, differences remain, as illustrated by the comparison of interest rate stress factors for selected markets in Asia in Figure 4.

FIGURE 4: KEY PARAMETERS COMPARISON FOR INTEREST RATE FOR SELECTED TERM TO MATURITY, SHOCK DOWN

CAPITAL REGIME	INTEREST RATE/ALM, STRESS-BASED						
	APPLIES TO INTEREST RATE OR OTHERWISE AS STATED						
TERM TO MATURITY (YEAR)	1	3	5	7	10	15	20
BRUNEI RBCS	-60%	-55%	-55%	-50%	-40%	-30%	-20%
CHINA C-ROSS (PHASE II) <sup>(a)</sup>	-71%	-61%	-48%	-42%	-34%	-25%	-23%
HONG KONG RBC (EARLY ADOPTION) <sup>(b)</sup>	-75%	-64%	-61%	-57%	-53%	-49%	-43%
MALAYSIA RBC <sup>(c)</sup>	-15%	-15%	-15%	-15%	-15%	-15%	-15%
PHILIPPINES RBC 2	-100%	-59%	-54%	-54%	-54%	-51%	-51%
SINGAPORE RBC 2	-70%	-65%	-60%	-50%	-40%	-30%	-25%
SRI LANKA RBC	-75%	-56%	-46%	-39%	-31%	-27%	-29%
THAILAND RBC 2 (95TH PERCENTILE)	-40%	-38%	-36%	-34%	-31%	-26%	-21%
SOLVENCY II	-75%	-56%	-46%	-39%	-31%	-27%	-29%

### Notes:

(a) China has different shocks for assets and liabilities. The asset shocks are shown in the figure. The liability shocks are generally lower.

(b) For Hong Kong, the absolute change in yield curve relative to the base scenario is limited to 200 bps, and this was triggered as at the end of 2022.

(c) For Malaysia, the stress is formula-based and depends on the MGS yield. The stress shown above for comparison purposes is applicable as at the end of 2022.

For ICS, the interest rate risk charge is based on a combination of five stresses: mean reversion, level up, level down, twist up-to-down, and twist down-to-up scenarios. A similar approach is considered for K-ICS, T-ICS and Japan EBS.

## Pillar 2: Enhancement and alignment of qualitative requirements

From a Pillar 1 perspective, there is a general trend towards using an economic balance sheet to measure quantitative capital requirements. In addition, from a Pillar 2 perspective there is also increased alignment amongst Asian regulators in terms of qualitative requirements. Typically, this includes a requirement for insurers to develop an enterprise risk management (ERM) framework and to perform an assessment of the insurer's own capital needs based on the risk exposures of the insurer. This latter exercise is often referred to as an ORSA.

In the last year, two Asian regulators have enhanced their qualitative requirements. The Philippines Insurance Commission issued circular letter 2022-41 in August 2022 that will require larger insurers to implement an ORSA framework. Insurers above a certain size threshold were required to develop an ORSA policy by end-June 2023, and submit the first ORSA report to the regulator by Q4 2024. Meanwhile, in Vietnam, the Insurance Supervisory Authority (ISA) under the Ministry of Finance, issued circular 70 in November 2022. This circular requires insurers to implement the "three lines of defence" model and an ERM framework, and to produce a Risk Management Report (similar to an ORSA) on a quarterly and annual basis.

The alignment of qualitative requirements is partially driven by the requirements of the International Association of Insurance Supervisors (IAIS), which sets out standards and guidance for insurance supervisors in the Insurance Core Principles (ICPs). Specifically, ICP8 covers Risk Management and Controls and ICP16 covers Enterprise Risk Management. The standards, and some of the additional guidance, are typically adopted by Asian regulators. The standards from ICP16 are adapted and summarised below:

- Insurers should develop an ERM framework that enables identification of all foreseeable, material risks and dependencies for risk and capital management.
- Insurers should quantify risks and perform stress testing.
- An insurer's ERM framework should reflect the linkages between risk appetite, risk limits, regulatory capital requirements, economic capital and risk monitoring.
- Insurers should have a risk appetite that is operationalised through more granular risk limits.
- Insurers should have a policy on asset-liability management (ALM).
- Insurers should have a policy on Investment risk.
- Insurers should have a policy on underwriting risk.
- Insurers should have a policy on liquidity risk.
- Insurers should ensure they perform liquidity stress testing, have sufficient highly liquid assets, have a liquidity contingency funding plan and submit a liquidity risk management report to the supervisor.
- Insurers should regularly perform an Own Risk and Solvency Assessment (ORSA) to assess the adequacy of risk management and the current, and likely future, solvency position.
- The insurer's board of directors and senior management should be responsible for the ORSA.
- The ORSA should cover all foreseeable and material risks including at least insurance, credit, market, concentration, operational, liquidity and group risks. It should assess the insurer's resilience to shocks and assess counterparty exposures.
- The ORSA should determine the overall financial resources needed to manage the business given the risk appetite and business plans. The insurer should base its risk management actions on consideration of available and required economic and regulatory capital, and the ORSA.
- The ORSA should analyse the ability of the insurer to continue in business over the medium- to longer-term.
- The insurer should analyse the risks to solvency and consider the options for recovery.
- The supervisor undertakes reviews of the ERM framework including ORSA and requires strengthening of the ERM framework where appropriate.

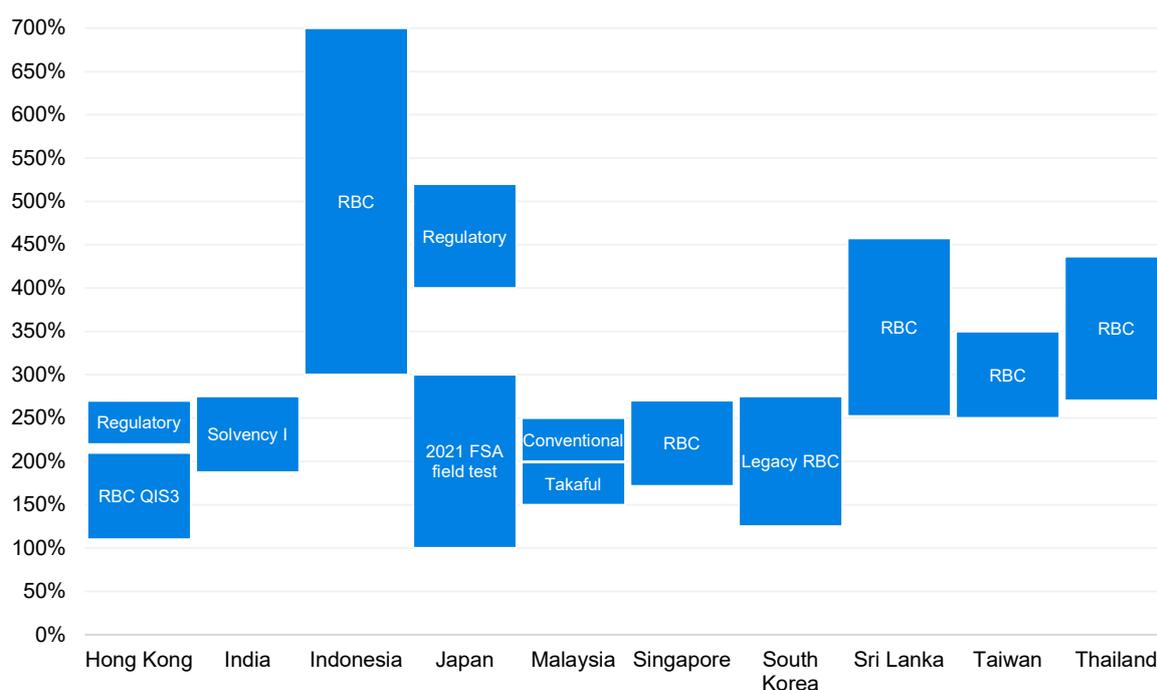
Insurance supervisors are subject to assessment of how well they have implemented the standards laid down in the ICPs, as part of the Financial Sector Assessment Program (FSAP), which is a joint assessment by the International Monetary Fund (IMF) and the World Bank. Given this, it is to be expected that all jurisdictions will look to enhance their frameworks to ultimately converge to the standards laid down in the ICPs.

## Comparative analysis of key capital results across Asia and impact of new RBC regimes on life insurance companies

### Comparative analysis of Capital Adequacy Ratios (CARs) across Asia

Figure 5 shows the industry average CARs for each market covered in this report, except for China, Brunei, the Philippines and Vietnam, where there are data limitations. Most of the markets have an average regulatory solvency ratio within the range of 180% to 400%, except for Japan and Indonesia, which have relatively higher average solvency ratios above 400%.

FIGURE 5: TYPICAL INDUSTRY SOLVENCY RATIO LEVEL



Source: Estimates based on public information and Milliman internal data. Some companies may experience higher or lower solvency ratios than the industry average shown above.

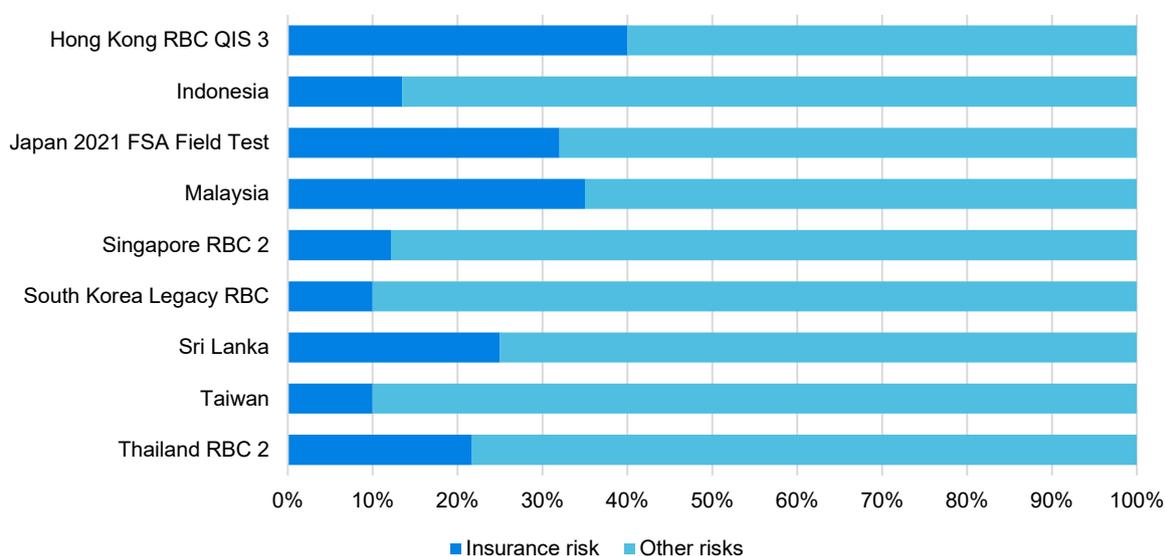
Note 1: The solvency ratios shown above are as at 31 December 2022 using prevailing capital regimes for each market except: a) Japan regulatory solvency ratio and India Solvency I solvency ratio are as at 31 March 2022, b) Japan 2021 FSA field test result is as at 31 March 2021, c) Sri Lanka is as at 31 December 2021, d) Hong Kong RBC QIS 3 is as at 31 December 2018, and e) South Korea Legacy RBC results are as at 30 September 2022.

Note 2: The IA carried out QIS 3 for the developing RBC regime in 2019, and the resulting average industry solvency ratios are expected to fall in the range of 100% to 200% based on Milliman information gathered from the industry. There has been no further industry-wide assessment for Hong Kong since then. Similarly, Japan's FSA carried out an economic balance sheet RBC field test in 2021, and the resulting average solvency ratios fell in the range of 100% to 300%. However, both QIS were conducted using parameters and approaches that are currently going through review and further consultation. The average industry solvency ratios under the final implemented RBC requirements are likely to differ (potentially significantly) from those shown.

In general, industry-level solvency ratios in Asia have been relatively stable over the past few years, with small changes driven primarily by changes in the interest rate environment (with government bond yields typically used to determine the discount rate, as discussed above) and updates in solvency regimes (e.g., Singapore RBC 2, Thailand RBC 2). In early 2020, the outbreak of the COVID-19 pandemic hit the global economy, with many Asian governments cutting interest rates in order to stimulate economic activity, with government bond yields falling. In 2020, the downward pressure on fixed-income yields affected both assets and liabilities of life insurance companies and led to a decrease of solvency ratios across most Asian regimes that had an economic balance sheet framework. Since 2021, solvency ratios in several markets have recovered as a result of the implementation of de-risking strategies by some companies and an increase in fixed-income yields.

As shown in Figure 6, for markets with RBC regimes, the total capital requirement (TCR) tends to be mainly driven by market risks (i.e., interest rate, equity and credit spread), although lapse risk and morbidity risks are also key contributors, especially for markets with more material proportions of unit-linked business (e.g., Malaysia or Indonesia). In some markets such as Japan, currency risk can also be material.

**FIGURE 6: RISK CHARGE BREAKDOWN – INSURANCE RISK VERSUS OTHER RISKS**



Source: Estimates based on public information and Milliman internal data.

Note 1: The figures above are as at 31 December 2022 based on prevailing RBC regimes of each country except: a) Japan 2021 FSA field test result is as at 31 March 2021, b) Sri Lanka is as at 31 December 2021; and c) the IA carried out QIS 3 for the developing RBC regime in 2019.

The industry-level CARs and the breakdown of risk charges can be explained largely by the nature of assets, the nature of liabilities and the matching (or lack of matching) of assets and liabilities.

More than half of the life insurance assets across these markets are invested in bonds, with insurers in some markets investing a high proportion in government bonds (e.g., Thailand), while others are investing higher proportions in corporate bonds (e.g., Hong Kong) and alternative credit (although this remains small). The proportion of equities varies by jurisdiction, with markets that have material proportions of participating business (e.g., Singapore, Malaysia and Hong Kong) typically investing more in equities with an increasing focus on less liquid asset classes (e.g., private equity, private debt, equity/property funds).

Liabilities also differ significantly from one market to another due to product mix differences. The proportion of unit-linked business is significant in some markets (e.g., Indonesia, India and Malaysia), while universal life business has been popular in Hong Kong, Singapore and South Korea. Non-participating traditional business (e.g., endowments, whole life, credit life, term life) remains a material product category for all the markets studied. Participating business (e.g., endowments, whole life) is also a popular line of business for some markets across the region, including Japan, Hong Kong, Singapore, India, Malaysia and Sri Lanka. Unit-linked business and insurance products with lower investment guarantees and more protection benefits typically look more attractive under an economic balance sheet framework, whereas savings products with higher investment guarantees (implicit or explicit) generally look less attractive (the degree of attractiveness being typically measured in terms of new business margin). As a part of the liability in the economic balance sheet framework, TVOG measures the in-the-moneyness of the investment guarantees embedded in the products. Figure 7 provides a high-level overview of the materiality of TVOG for selected markets.

FIGURE 7: OBSERVATIONS ON TVOG IN SELECTED MARKETS

MARKET	CAPITAL REGIME	TVOG CONSIDERED?	MATERIALITY OF TVOG
HONG KONG	Solvency I (moving to RBC)	✓ (under RBC)	TVOG could be relatively material for participating and universal life products, two of the main product categories sold in Hong Kong.
INDIA	Solvency I	✓	Generally not material as: <ul style="list-style-type: none"> <li>▪ The levels of guarantees for participating products are typically low and interest rates are still relatively high. Hence, participating product guarantees are typically out-of-the-money.</li> <li>▪ Capital guarantees are not widespread for unit-linked business.</li> </ul> However, for non-linked group funds management business, guarantee costs may be significant depending on the level of asset/liability duration mismatch.
INDONESIA	RBC	✗	While there is a shift in trend from multinationals selling unit-linked products to traditional products, the levels of guarantees of most of the traditional products sold are typically low. The traditional savings products sold by domestic players may have a significant TVOG.
MALAYSIA	RBC	✓	Generally not material as: <ul style="list-style-type: none"> <li>▪ TVOGs for participating products are currently out-of-the-money.</li> <li>▪ Other products typically do not have material TVOG.</li> </ul>
SINGAPORE	RBC	✗	TVOG is not assessed as part of the RBC framework, hence no formal quantification of TVOG is publicly available.  While TVOG is not expected to be material for most products (as investment guarantees are generally low and out-of-the-money), it is expected to be material for some products such as universal life and single premium participating products.
TAIWAN	RBC	✗ (might be considered under T-ICS)	TVOG is not assessed as part of the current RBC framework, hence no formal quantification of TVOG is publicly available.  When moving to T-ICS, TVOG is expected to be material given the nature of products sold in the market. However, as the industry is currently undergoing QIS, the exact impact is not known at present.
THAILAND	RBC	✗	Generally not material as: <ul style="list-style-type: none"> <li>▪ Most products are non-participating in nature.</li> <li>▪ The participating component is typically not material and does not lead to a material TVOG.</li> <li>▪ Unit-linked (without investment guarantee) are also becoming more material for some companies.</li> </ul>

Source: Estimates based on public information and Milliman market intelligence.

The comments regarding the materiality of TVOG in the figure above are general comments related to the relevant market in question, based on our observations. The situation for individual companies within the market may vary.

### Potential impact of changes in capital regimes for life insurance business in Asia

A move to a more “economic” RBC regime tends to incentivise life insurers to optimise and potentially de-risk their balance sheets by

- Shifting more risks to policyholders (e.g., by selling more linked products) and third-party asset managers or reinsurers (e.g., through the use of more traditional mortality/morbidity/lapse reinsurance or through the use of block reinsurance transactions).
- Improving ALM, optimising investment strategies (including dynamic strategic asset allocation) and hedging strategies with an objective to increase the company-specific illiquidity premium (when appropriate), reducing the interest rate risk capital requirement and ultimately reducing the volatility of the capital balance sheet.
- Reducing the level and cost of guarantees through the review of the product offerings or through the review and enhancement of dynamic management actions implemented within the actuarial model.
- Tailoring existing insurance product features to be more RBC-friendly or shifting the product mix to less capital-intensive products.

These new capital regimes necessitate insurers to use more sophisticated and value-risk-based techniques to set and validate strategic decisions and manage their business.

- **Strategic planning and risk management.** In line with shareholder expectations, many insurers currently conduct their strategic planning with a key focus on traditional top-line revenue and bottom-line profitability growth metrics, e.g., annualised premium equivalent (APE) growth, (traditional) embedded value (EV) growth, value of one year's new business (VONB) margin. Under the new RBC regimes (and IFRS 17), these measures would need to be updated and supplemented by additional risk-based metrics that clearly identify the trade-off between shareholder value (e.g., measured in terms of EV or VONB) and risk (e.g., measured in terms of RBC requirements and return on capital). Strategic planning will not only be a matter of finding the appropriate business strategy to grow revenue and profitability under the base case scenario, but also a matter of optimising capital and controlling and reducing risk under stress scenarios.
- **Setting target capital requirement and embedding into business processes.** A key parameter of the strategic planning is the target solvency ratio. With the change in the underlying capital regime, life insurance companies need to review and enhance their target capital methodology and target solvency ratio. This then needs to be embedded in all business processes of a life insurance company, including business and capital planning, pricing, business key performance indicators (KPIs), mergers and acquisitions (M&As), embedded value and other reporting.
- **Capital management, strategic asset allocation and hedging strategy.** Changes in capital regulations will likely prompt insurers to revisit their existing capital management, strategic asset allocation and hedging programs. In particular,
  - Optimising capital requirement and return on capital will become an increasingly key priority. Management actions will need to be tailored to better reflect management decisions under stress scenarios that affect the risks faced by the company, and ultimately to make allowance for this within the assessment of RBC capital. Reinsurance strategies could be also further optimised.
  - Strategic asset allocations will need to be revised, with potentially less focus on levels of asset returns and more emphasis on risk-based metrics. More dynamic hedging programs may become increasingly relevant, targeting a certain level of volatility whilst keeping a material exposure to achieving upside.



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