Managing an economic balance sheet in Asia using more advanced ALM and hedging strategies

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Agenda

- Impact of ALM risks on the economic balance sheets
- Case Study 1. Hedging ALM Risk for Par
- Case Study 2. Optimising ALM risk / capital allocation via dynamic SAA
- Closing Remarks and Q&A

Impact of ALM risk on the economic balance sheets

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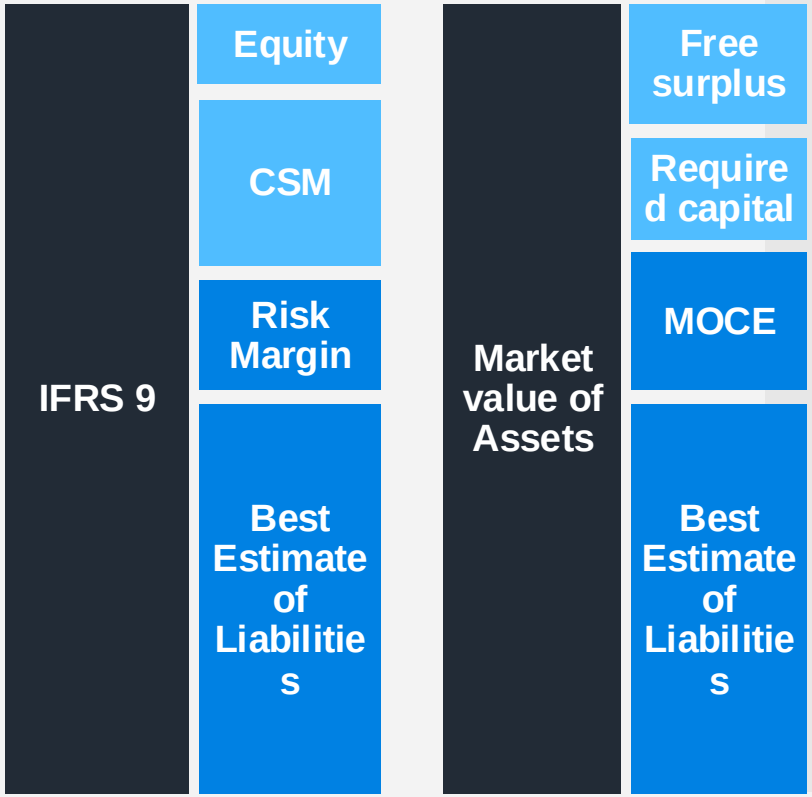
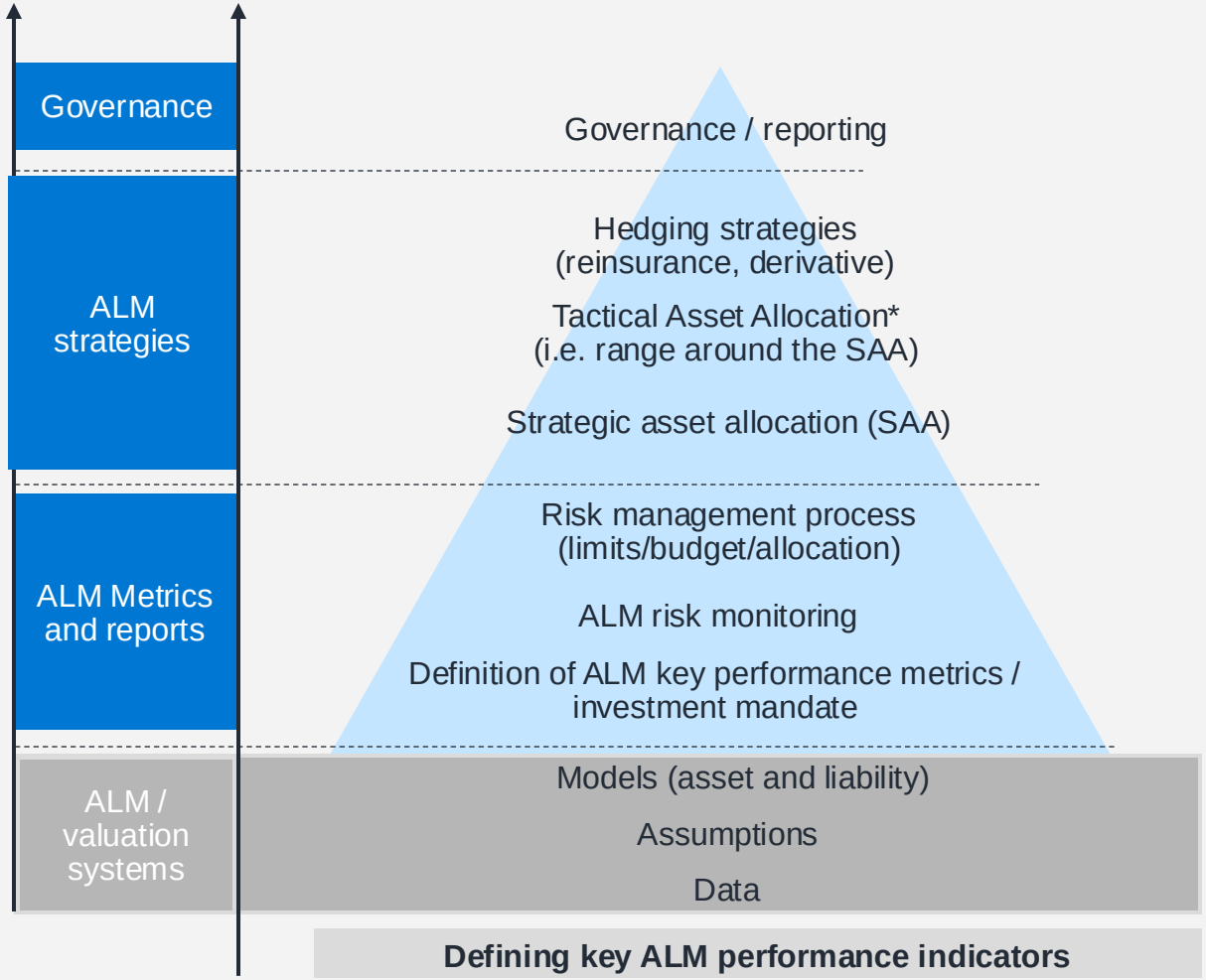
Key sources of ALM risks and impact on ICS / IFRS 17

IFRS 17 and ICS balance sheets



- 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, e.g., the fair value of liabilities is not fully market consistent (e.g., construction of the risk discount rate, illiquidity premium)
  - Presence of options and guarantees
  - Off-balance sheet exposures
- The balance sheet volatility is typically explained by the interest rate risk, although other aspects could also play a major role (equity volatility / policyholders' persistency)

ALM objectives and typical ALM activities



Overarching ALM objectives :

- Meet all financial obligations in full as they fall due in the foreseeable future.
- Limit ALM risks to those that are sufficiently compensated after considering the cost of capital and any other internal constraints
- Optimize shareholder and policyholder values based on ALM risks

Key ALM considerations:

- Basis of measurement: economic vs statutory vs other balance sheet, deterministic vs stochastic
- Definition of risk and return indicators
- Definition of interactions between assets and liabilities
- Level of granularity of the ALM analysis

* Typically, under the scope of the investment team although usually requires inputs from the ALM team

Case Study 1.

Understanding and hedging ALM Risk for Par

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Recap: Key ALM Metrics

Typical interest rate / FX risk management framework

- ALM risk analysis
- Liquidity risk analysis

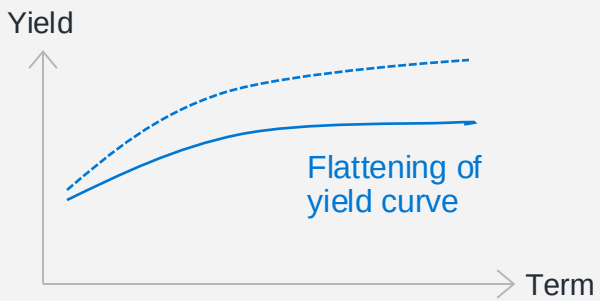
$$\Delta(value) \sim duration \times \Delta(interest\ rate) + \Delta(duration) \times \Delta(interest\ rate)$$

Convexity

- **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:

	Duration
Assets (“A”)	9.6
Liabilities (“L”)	10.1
Duration gap (= L less A)	0.5

Duration gap indicates a small risk



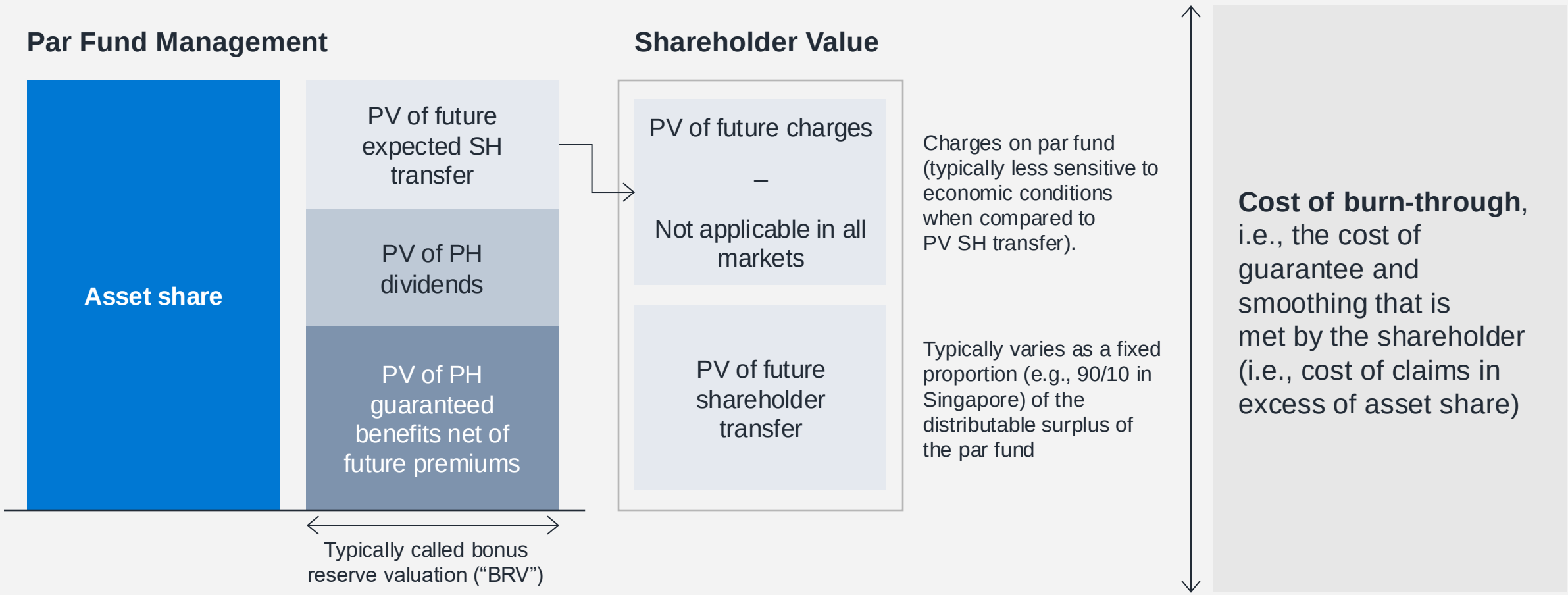
Total duration = sum of all key-rate durations

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	
Δ in spot rate	*-12bp*	*-25bp*		*-80bp*	
% Δ in NAV/(asset /liabilities)	+0.40%	-0.03%	…	-2.72%	…

Key-rate duration reveals “hidden” risks

The Problem We Need to Solve

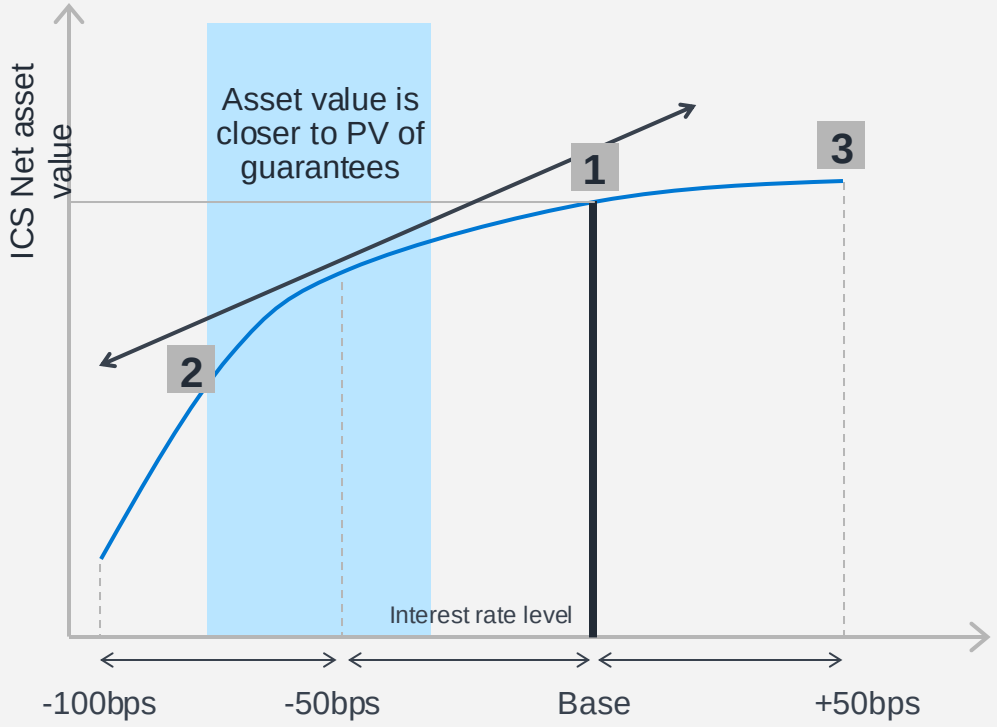
Par fund management framework



The Problem We Need to Solve

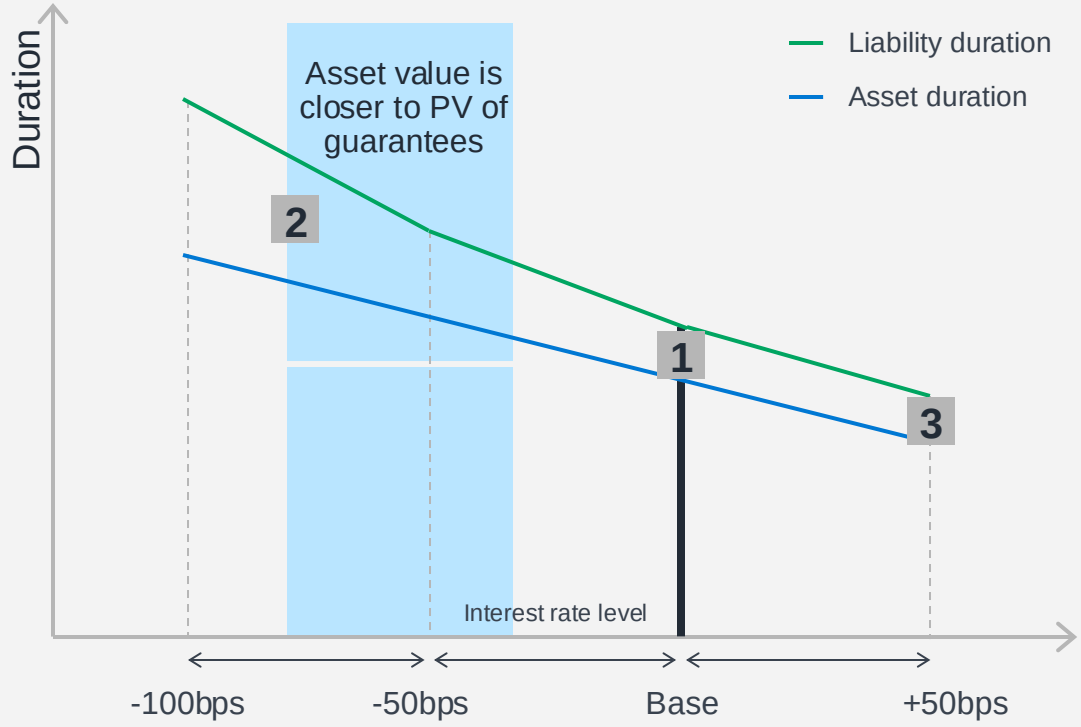
ALM risk for par

<u>The shareholder view</u>: net asset value



The net asset value is **a non-linear function of the underlying interest rate**. In other words, the burn-through increases more when interest rates are getting closer to the level of guarantee.

<u>The ALM view</u>: Asset and liability duration gap



The **duration gap increases when interest rates reduce** (i.e. non-guaranteed benefits can not be further reduced) while the duration gap is more stable when interest rates increase.

Managing Key Sources of Interest Rate Risk

Duration mismatch – No hedging

Duration Gap (“DG”), i.e. liability duration > asset duration

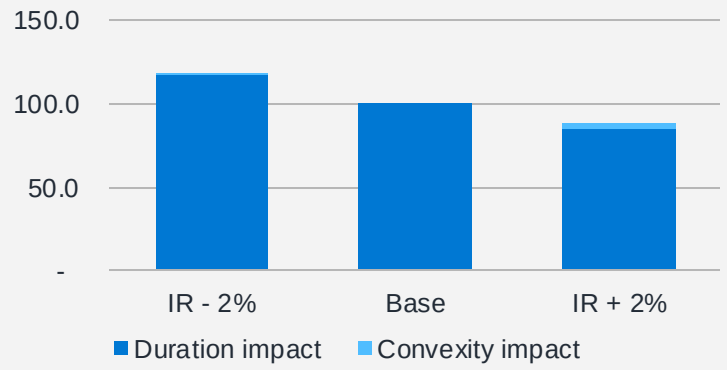
	Interest rates decrease	Interest rates increase
Typical impact on par fund	**Negative DG** Δ(net asset value) > 0	**Negative DG** Δ(net asset value) < 0
	Positive DG Δ(net asset value) < 0	**Positive DG** Δ(net asset value) > 0

Initial objective: reduce the duration gap to avoid volatility in the net asset value

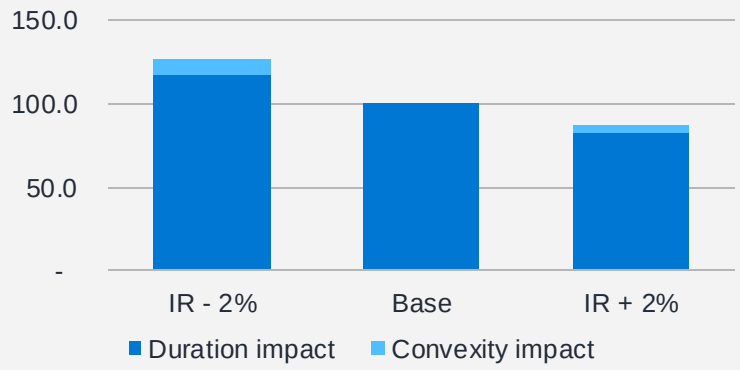
Managing Key Sources of Interest Rate Risk

Duration mismatch – Physical asset strategy (illustrative example)

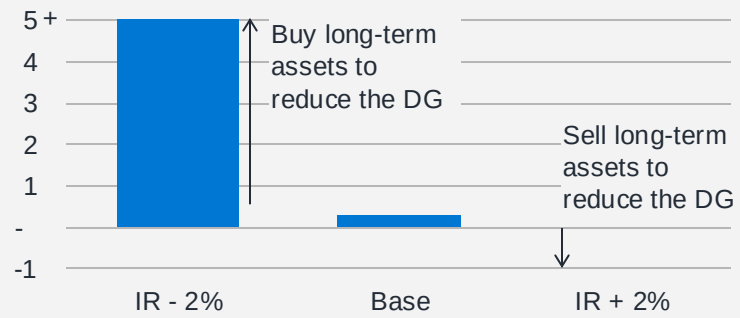
Asset Impact
(base duration = 8.6)



Liability Impact
(Base duration = 8.9)



Duration Gap
(i.e. Liability Duration - Asset Duration)

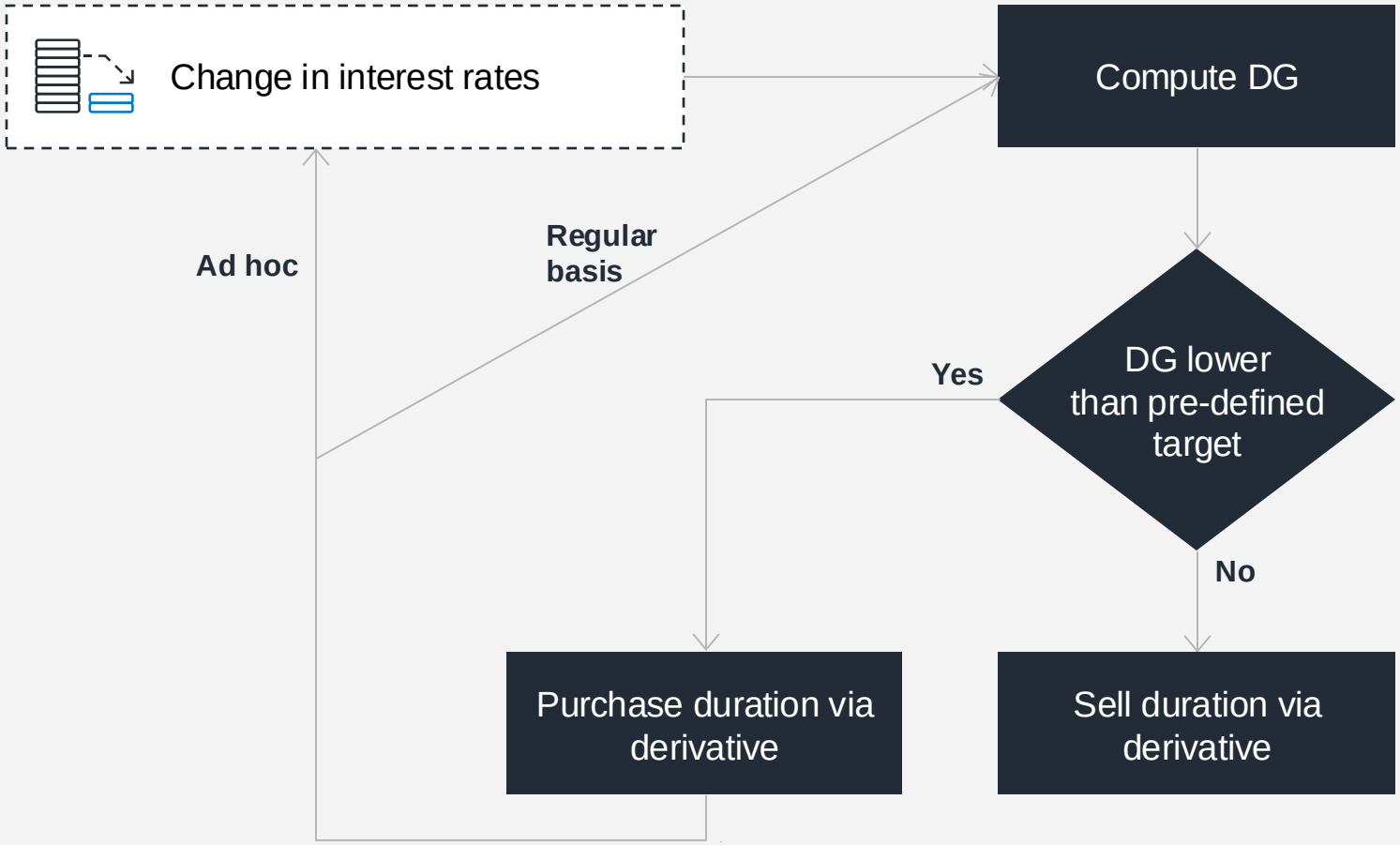


Change in IR	Change in DG	DG management	SH surplus
Rates decrease (increase)	Duration of liability increases (decreases) more than does duration of assets; **DG increases (decreases)**	Insurer buys (sells) duration to maintain DG within range	**Value destruction** (buy high, sell low)

Source: Milliman based on a simple illustrative example.

Managing Key Sources of Interest Rate Risk

Duration mismatch – Derivative strategy



- When the physical asset portfolio is rebalanced to match a particular constraint on duration gap, it is at **cost**.
- The cost could **be reduced by considering a more dynamically managed portfolio derivatives** (e.g., Delta 1 hedge).
- A **interest-rate hedging framework** should therefore bet put in place, as illustrated on the left. In practice, additional considerations may impact the framework

Case Study 2.

Optimising ALM risk / capital allocation via dynamic SAA

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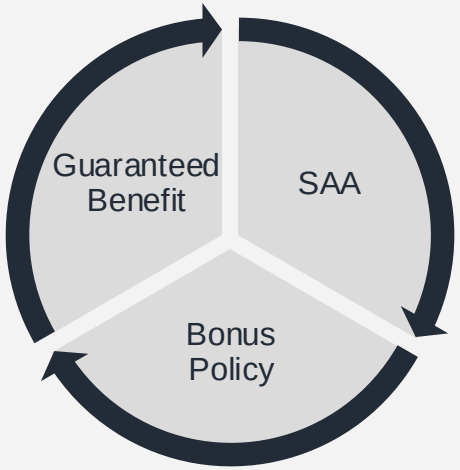
Dynamic SAA

Key objectives of a dynamic equity backing ratio (“EBR”) investment strategy.

Varying the proportion of growth assets to better reflect the economic fund surplus over the value of the guaranteed liabilities (future guaranteed benefits should be backed by less risky assets).	Enhancing the financial strength under an economic balance sheet basis through better asset and liability matching.	Improving the overall market-based financial position and hence stabilize the distributable earning pattern under HK RBC and IFRS 17 frameworks.	More dynamic allocation of capital with objective to improve the outcome to policyholders and shareholders.

Dynamic SAA process



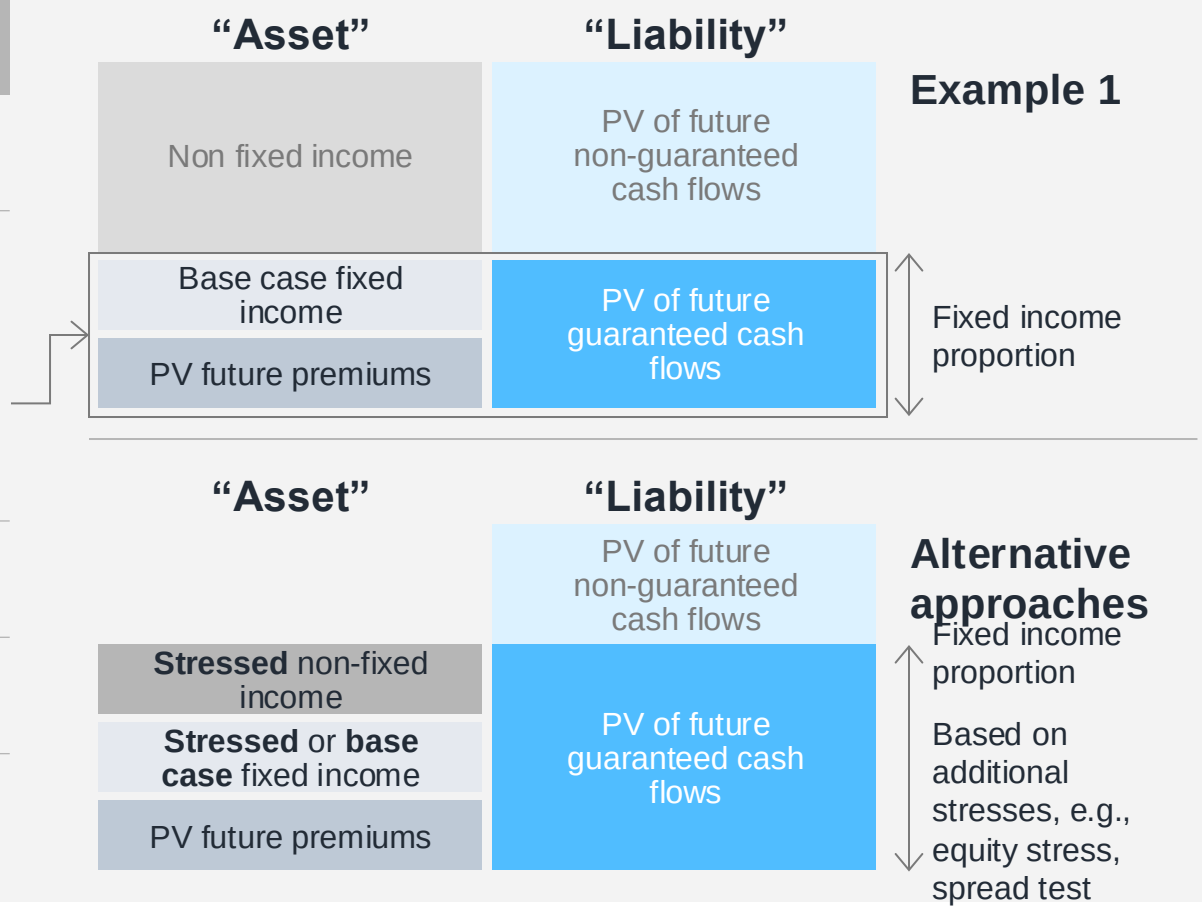
At time = t

	Asset	**Liability**
	More risky assets, equity	PV of future non-guaranteed cash flows
	Less risky assets, e.g., Bond	PV of future guaranteed cash flows

Dynamic SAA

Sample Approaches Used by Life Insurers in HK/Singapore

	Example 1
Overall Approach	Future guaranteed benefits must be supported by the bond portion in the asset share
Mechanism	Asset share is split in terms of fixed income assets and equities. The minimum amount of fixed income assets is determined based on the present value of future guaranteed benefits, the remaining being invested in more risky assets.
Smoothing Threshold	The asset allocation period-to-period changes cannot exceed a certain limit
Limits to Equity Exposure	Yes – Calibrated using a 1-in-x stress
Rebalance Frequency	Quarterly or drastic market change



Closing Remarks

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Q&A

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