Session 2: Introduction to Embedded Value

Institute of Actuaries of India: Capacity Building Seminar on Embedded Values

A presentation by Kunj Behari Maheshwari, Director, Insurance Consulting &Technology, Willis Towers Watson

11 & 13 October 2017

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Any Questions?

Go to: **www.sli.do**

Enter event code: # IAI_EV

Life insurance is a relatively unique business
Consider an analogy – Car manufacturing

Design a car

Investment

Build a car

Expenses

Sell the car

Incomes
=> recognise profits

However, in insurance business, the timing of incomes and outgoes are reversed…

New-business sales
=> earn premiums

…years later…

Pay claims (outgoes):
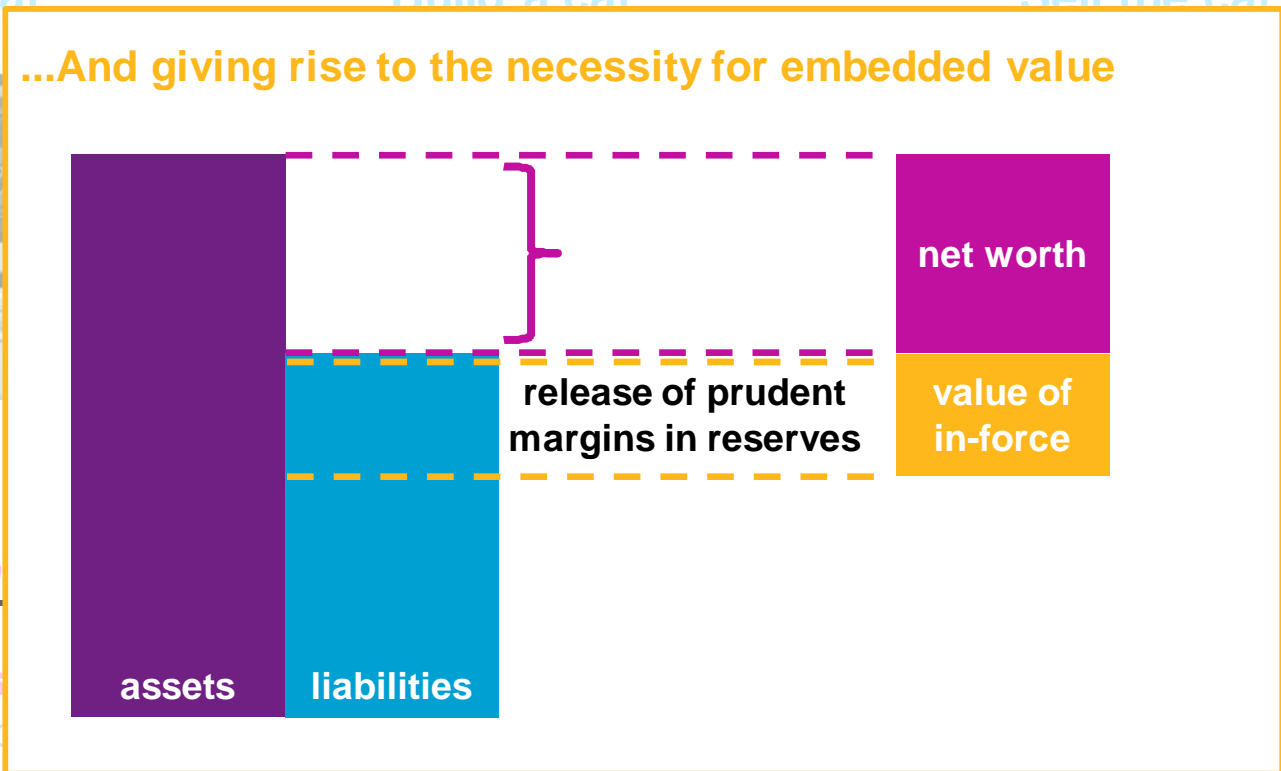=> True profits are not known until all policies have gone off the books

So, Why is EV relevant?
…because life insurance is a relatively unique business

Design a car

Build a car

Sell the car

...And giving rise to the necessity for embedded value

assets | liabilities

release of prudent margins in reserves

net worth

value of in-force

Incomes

...ecognise profits

However, in...versed…

New-bus...

=> earn p...

...s (outgoes):

...ofits are not known until all policies have gone off the books

Cumulative growth
in total premium

SBI Life

ICICI Prudential Life

HDFC Life

25%

22%

17%

Cumulative growth
in profits after tax

9%

7%

3%

FY15   FY16   FY17

source: company disclosures, Willis Towers Watson

top line *looks* sexy, bottom line *is* sexy

EV does not equal Market Value

**Market value may depend on a range of further considerations,
both technical and non-technical**

Franchise Value

representing the ability of the insurer to grow the business and generate profitable new business from the existing distribution infrastructure and franchise.

Confidence in EV

representing the ability to generate (operating) capital returns and pay dividends to realise the value implied by EV.

Market sentiments

representing overall economic outlook, investor sentiments and market positioning.

…leading to the market value being a multiple to EV / VONB

Although EV has become increasingly topical
…there are some words of caution for the actuarial community

Some voices from outside of the actuarial profession:

"In the Indian context, the EV is calculated on a market consistent ~

"There is no current plans to be disclosing that… because again in all fairness the whole issue about ~ I understand that like in ~

Ultimately, ownership for embedded value disclosures and standards must be taken up by the actuarial profession and we must ensure consistency, comparability and reliability across companies and over time for EV disclosures to remain credible.

disclose ~ to be caught in this game whe~ companies using different methodologies, different assumptions, different cuts to make themselves look worse or better"

~ace or worse. You are giving a multiple to the black box without knowing what it is"

Uday Kotak, Managing Director, Kotak Mahindra Bank, in response to question on plans for disclosing Embedded Value of Kotak Life, May 2016

Saibal Ghosh, **CIO of Aegon Life Insurance,** in response to basis for valuation of life insurance companies in India, September 2017

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Session 4: Market Consistent valuation

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A presentation by Kunj Behari Maheshwari, Director, Insurance Consulting &Technology, Willis Towers Watson
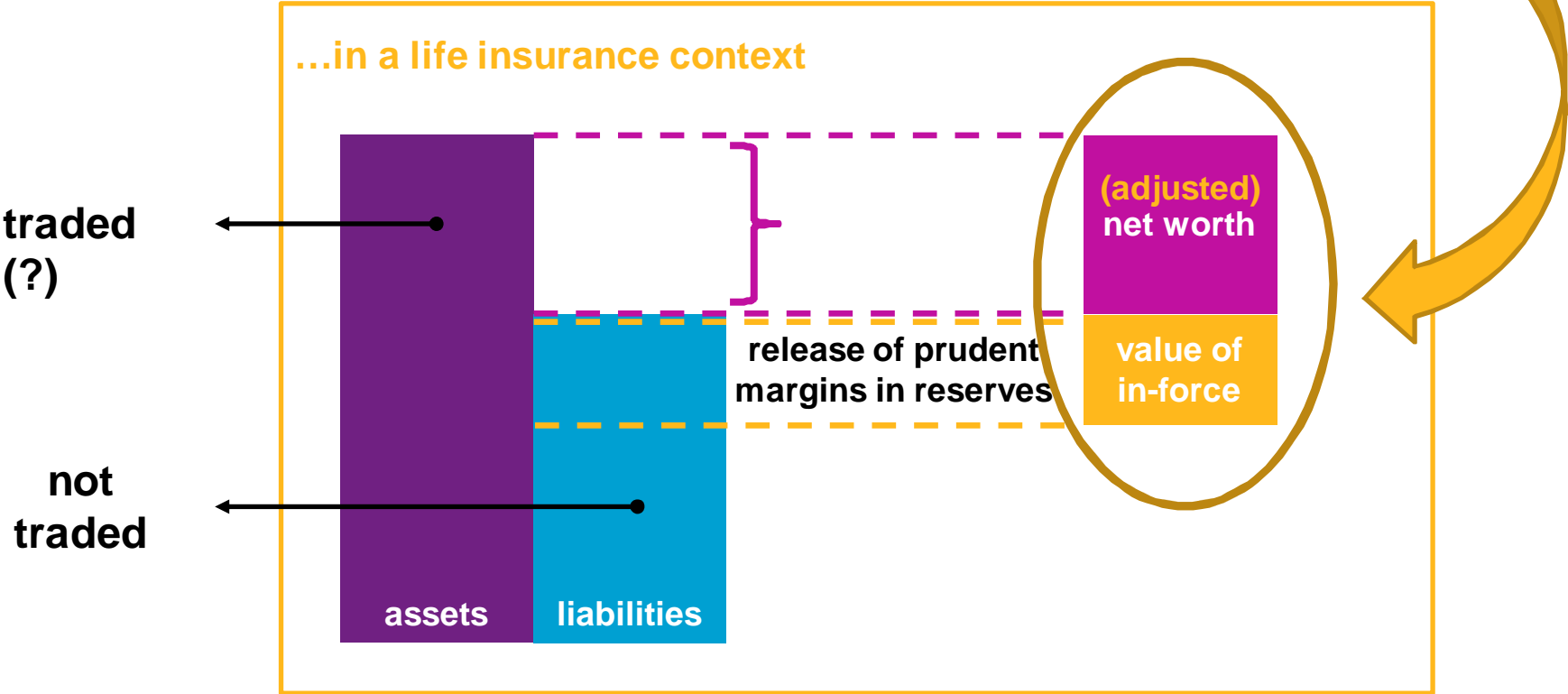
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What does "market consistent value" mean?

MCV of any asset or liability =
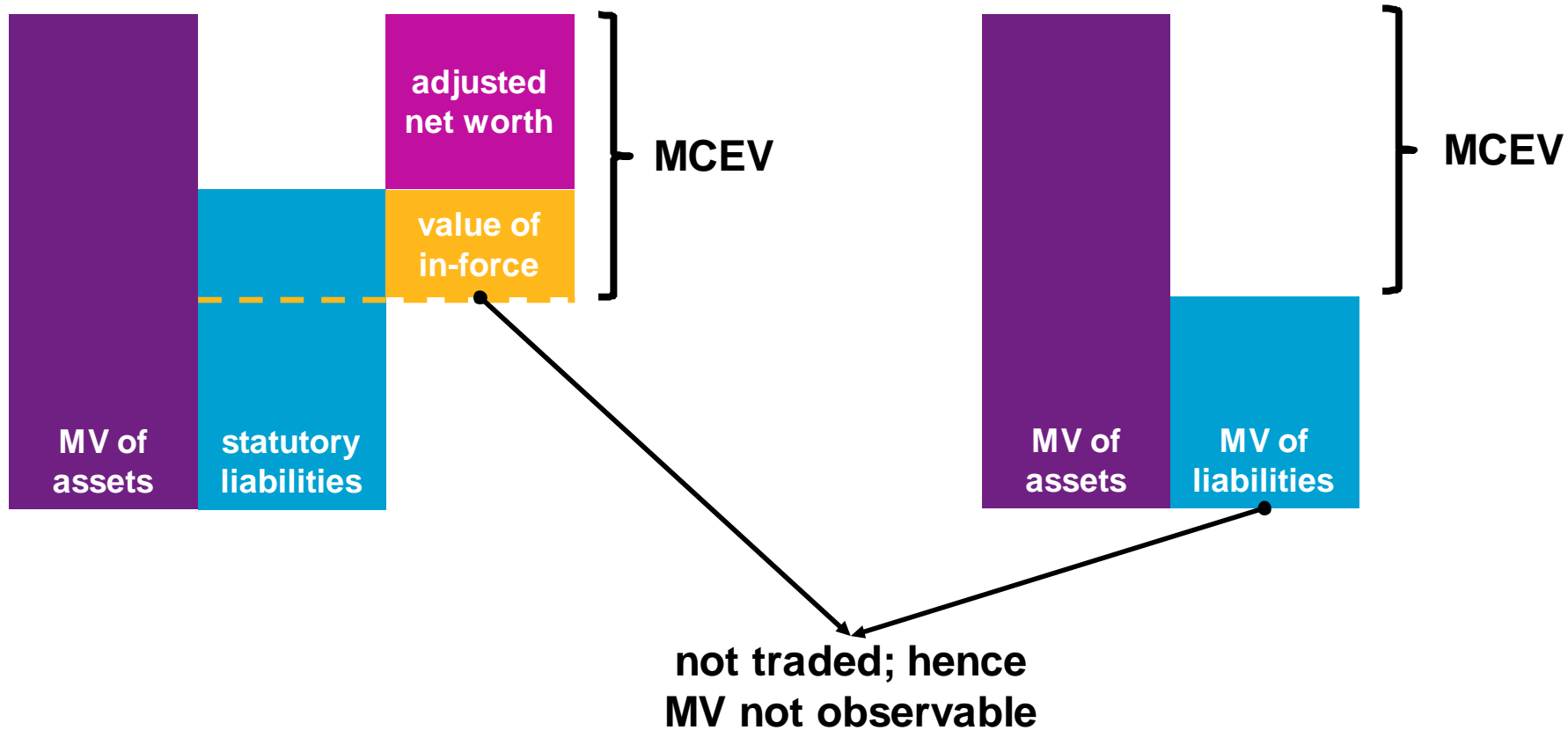
If traded, observed market value from actual trades

If not traded, a reasoned best estimate of what its market value would have been had it been readily traded

...in a life insurance context

traded (?)

not traded

release of prudent margins in reserves

(adjusted) net worth

value of in-force

assets   **liabilities**

…resulting in two equivalent ways of thinking about MCEV

MCEV = Net Worth + MC-VIF

MV of assets

statutory liabilities

adjusted net worth

value of in-force

MCEV

MCEV = MV Assets − MV Liabilities

MV of assets

MV of liabilities

MCEV

not traded; hence MV not observable

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How to determine a "reasoned best estimate" given that a market value for liabilities is not observable

…By application of some fundamental principles of financial theory

Risk-neutrality
all invested assets may be assumed to earn the same expected rate of return, the risk-free rate, regardless of the risks and expected pay-offs inherent in the specified asset

No arbitrage
if two portfolios have exactly the same payouts in all possible circumstances, then they have the same value ("law of one price")

Replication
systemic risks can be replicated through (dynamic) investment in a portfolio of traded assets

Diversification
risks that can be diversified away do not command any risk premium

Capital structure theory
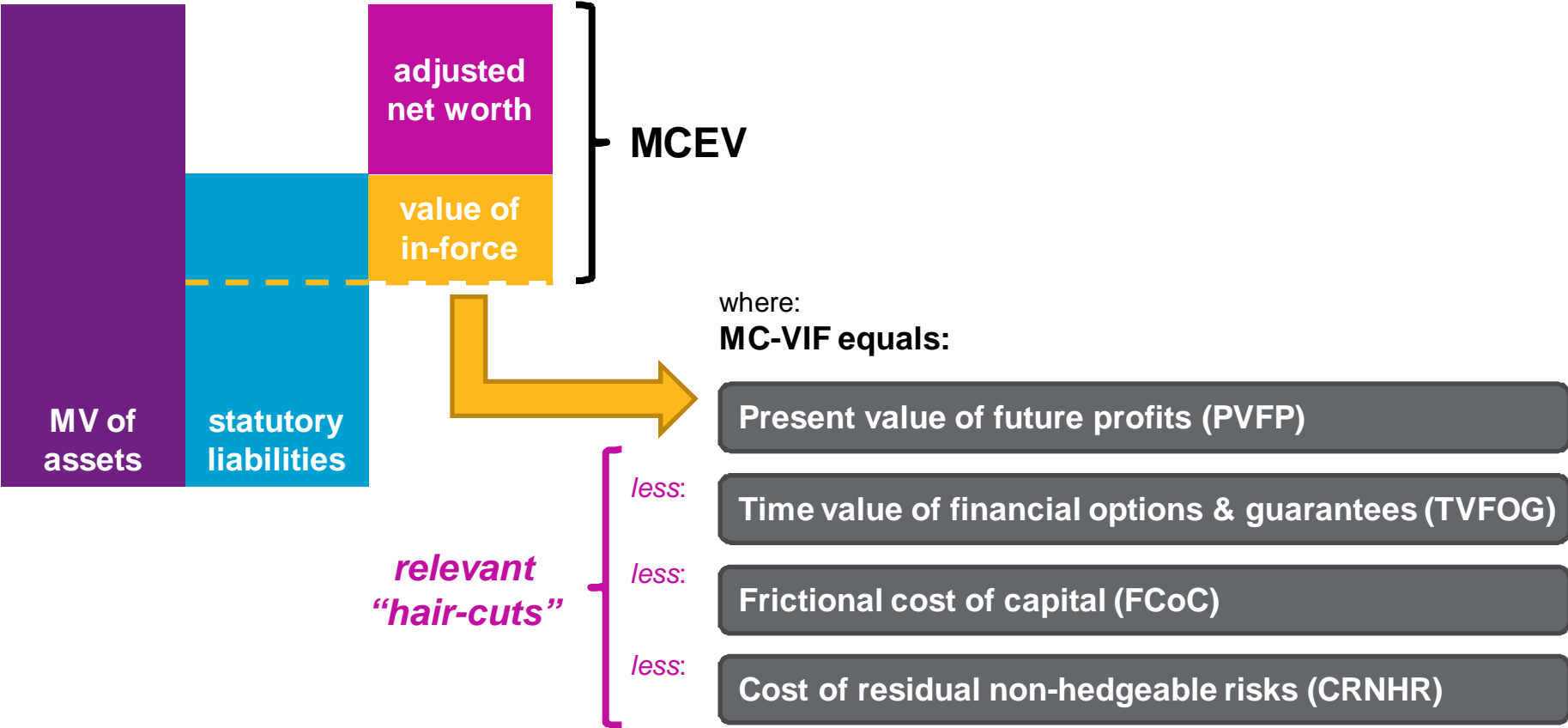the value of a company is impacted by its risk and capital structure

Bringing it all together: valuation implications of the financial mumbo-jumbo

Consider valuation of a risky (corporate) bond – not traded in the market

It is possible to adopt multiple approaches to valuation – theoretically providing the same result – subject to consistent "allowances for risk"

…Therefore, we now have a framework for a "reasoned best estimate" of market value of insurance liabilities that are not traded

MCEV = Net Worth + MC-VIF

adjusted net worth

value of in-force

MCEV

MV of assets

statutory liabilities

relevant "hair-cuts"

where:
MC-VIF equals:

Present value of future profits (PVFP)

less: **Time value of financial options & guarantees (TVFOG)**

less: **Frictional cost of capital (FCoC)**

less: **Cost of residual non-hedgeable risks (CRNHR)**

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A "reasoned best estimate" of MCV requires a bottom-up explicit identification and allowance for all risks within the embedded value

Typical allowance of various risks across different components of MCEV

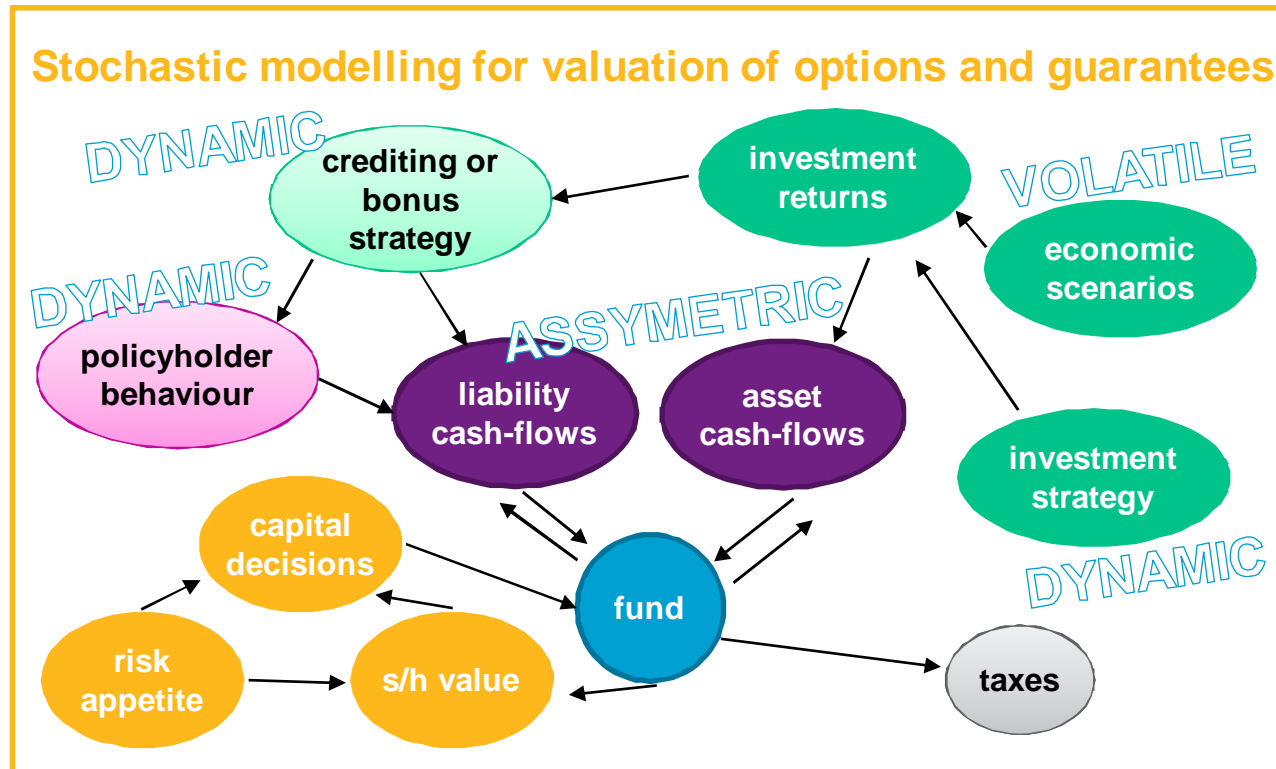|					Financial risks	Non-financial risks				
ANW	PVFP	TVFOG	CRNHR				ANW	PVFP	TVFOG	CRNHR
✓	✓	✓	?		interest rate	mortality / longevity				
					equity / property	morbidity				
					credit default / spread widening	pandemic and catastrophe				
					liquidity	persistency (level risk)				
					counterparty default	mass lapse				
					basis risk	expense and inflation				
					correlations	operational risk				
					sovereign default	other residual risks				

Components of MC-VIF:

Present value of future profits (PVFP)

- Projection of "risk-adjusted" long term insurance cash-flows
    - All assets and liability cash-flows are assumed to earn "risk-free" investment return, in respect of market risks;
    - Non-market risks are allowed for using best estimate projection assumptions
    - "Best estimate" defined as mean expectation of outcomes for that risk variable

Time Value of Financial Options and Guarantees (TVFOG)

- Shareholder outcomes are no longer symmetric around risk-free rates in the presence of embedded financial options and guarantees within insurance contracts

- Certainty equivalent PVFP captures the "intrinsic value"; hence a further deduction for the "time value" of options and guarantees is needed in the overall MC-VIF to assess the asymmetric impact on shareholder value

Stochastic modelling for valuation of options and guarantees

DYNAMIC

crediting or bonus strategy

investment returns

VOLATILE

economic scenarios

DYNAMIC

policyholder behaviour

ASSYMETRIC

liability cash-flows

asset cash-flows

investment strategy

DYNAMIC

capital decisions

fund

risk appetite

s/h value

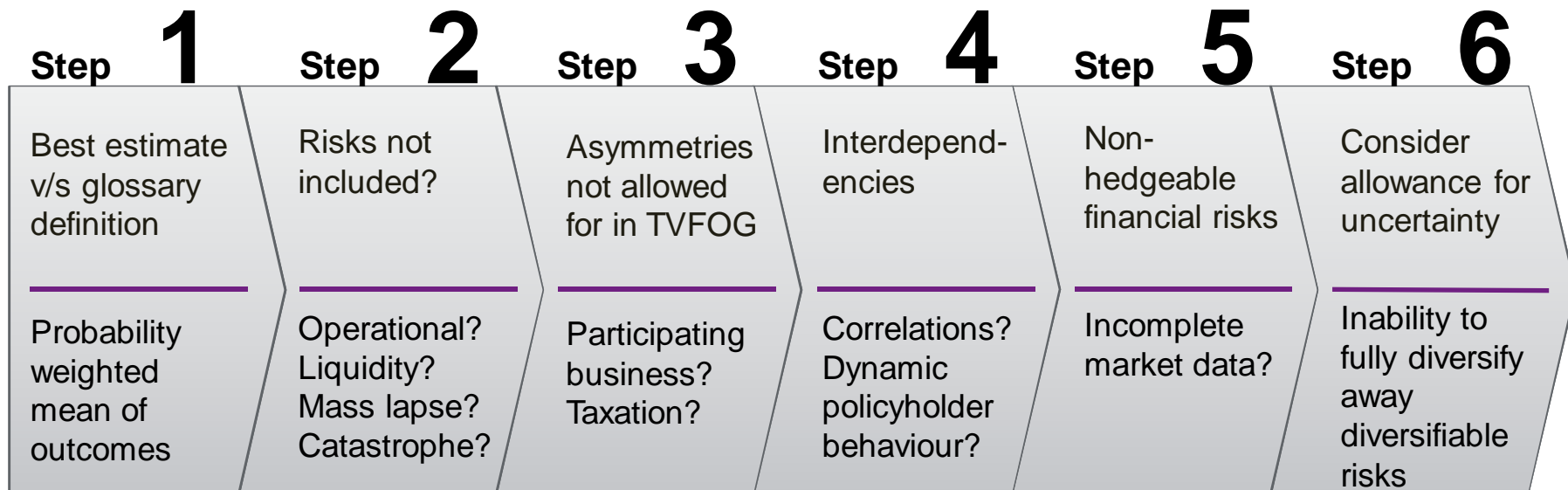**taxes**

Frictional Cost of Capital (FCoC)

- Reflects the "rupee" cost of holding required capital in the insurance business, comprising:
  - Investment expenses incurred on assets backing required capital; and
  - Tax on investment returns
- Measured from a shareholder perspective over the lifetime of the underlying risks
- More importantly, frictional costs **do not include**:
  - Agency costs;
  - Costs of financial distress;
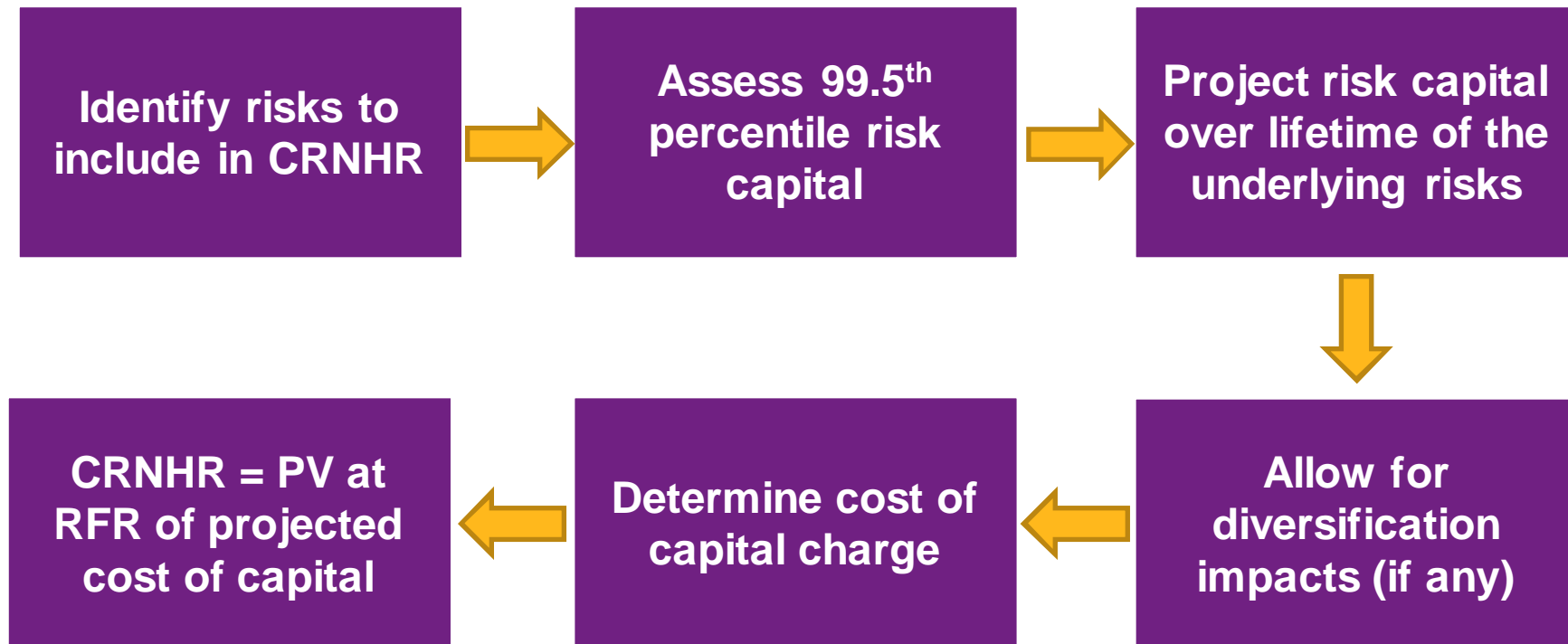 - Any "cost of lock-in" or opportunity cost of capital

Components of MC-VIF:

Cost of Residual Non-Hedgeable Risks (CRNHR)

- A final "hair-cut" for risks not already allowed for elsewhere (in PVFP and TVFOG)

A six step process for identifying risks eligible for CRNHR:

Step **1**	Step **2**	Step **3**	Step **4**	Step **5**	Step **6**
Best estimate v/s glossary definition	Risks not included?	Asymmetries not allowed for in TVFOG	Interdepend-encies	Non-hedgeable financial risks	Consider allowance for uncertainty
Probability weighted mean of outcomes	Operational? Liquidity? Mass lapse? Catastrophe?	Participating business? Taxation?	Correlations? Dynamic policyholder behaviour?	Incomplete market data?	Inability to fully diversify away diversifiable risks

Cost of Residual Non-Hedgeable Risks (CRNHR)

- A final "hair-cut" for risks not already allowed for elsewhere (in PVFP and TVFOG)

A cost of capital approach to measuring CRNHR:

Identify risks to include in CRNHR →	**Assess 99.5th percentile risk capital** →	**Project risk capital over lifetime of the underlying risks** ↓
CRNHR = PV at RFR of projected cost of capital ←	**Determine cost of capital charge** ←	**Allow for diversification impacts (if any)**

Mapping MCEV to TEV: Implied discount rates

Thank you

for further information, please contact:

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