32nd India Fellowship Seminar
Orchid Hotel, Mumbai
5th & 6th December, 2019

Market Consistent valuation in India
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Case Study 7

You are an actuary working for a life insurance company in India. As part of your role, you oversee solvency reporting and embedded value reporting. You note that recently there has been greater focus in the industry on use of market consistent valuation techniques - such as with focus shifting to Indian Embedded Value or Market Consistent Value from Traditional Embedded Value; market consistent valuation of liabilities which is required under draft Ind AS 117 as well as likely shift to a risk based capital framework in a few years which may also have some alignment with market consistent reporting techniques. In your opinion, applicability of such valuation techniques to the Indian insurance market is not seamless and one of your concerns is whether there exists a suitably liquid risk-free yield curve which can be used as a reference rate for such valuations. Discuss the issues related to applicability of market consistent valuation techniques for the Indian life insurance market and provide suggestions to address these limitations.

Agenda

❖ Overview of Embedded Value – EEV, TEV, MCEV

❖ Market Consistent Embedded Value – When & Why

❖ Market Consistent Liabilities – Common bases for reporting

  metrics

❖ Components of Market Consistent liabilities

❖ Market Consistent Liabilities – Challenges

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- ❖ **Overview of Embedded Value – EEV, TEV, MCEV**

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Embedded Value (EV)

Embedded Value = Adjusted Net Worth (ANW) + Present value of future profit (PVFP)

Approaches to calculate EV:

- ✓ **TEV** – Traditional Embedded Value
- ✓ **EEV** – European Embedded Value
- ✓ **IEV/ MCEV** – Indian Embedded Value/ Market Consistent Embedded Value.

European Embedded Value (EEV)

$$EEV = ANW + PVFP - CoC - TFVOG$$

- ✓ Adjusted Net Worth (ANW) = Required Capital (RC) + Free Surplus (FS)
- ✓ Present Value of Future Profits (PVFP) = Release of prudent margins in liabilities (held on prudent basis)
- ✓ Cost of Capital (CoC) = Cost of having to hold solvency margin
- ✓ Time value of financial options & guarantees (TVFOG) – represents the cost of options and guarantees
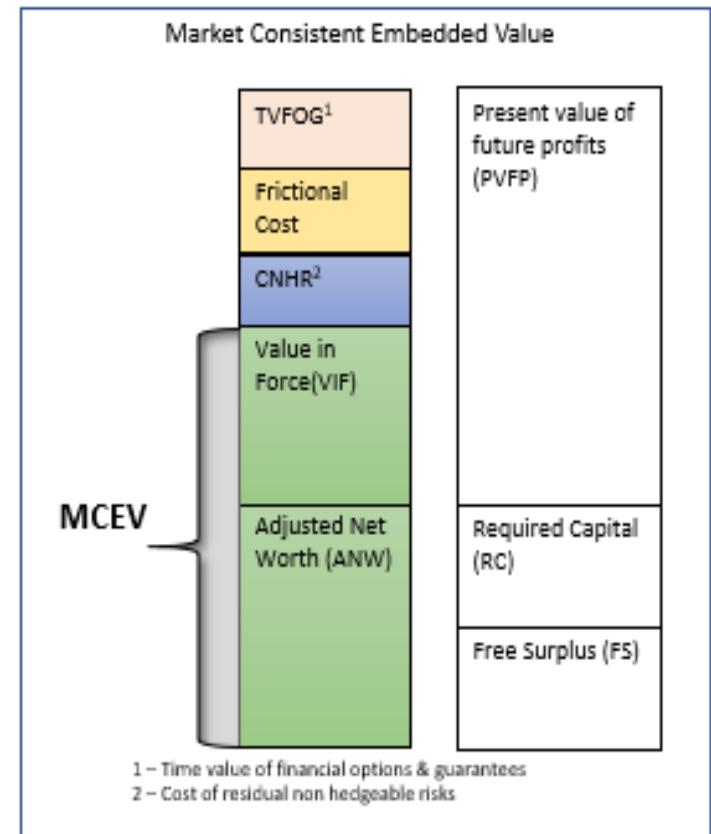
$$TEV = ANW + PVFP - CoC$$

European Embedded Value

- TVFOG[1]
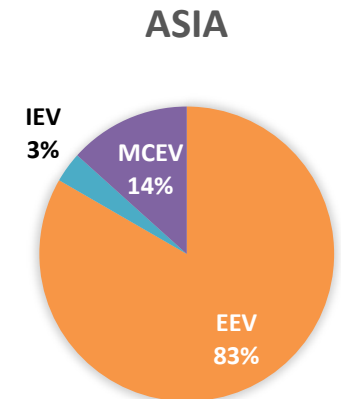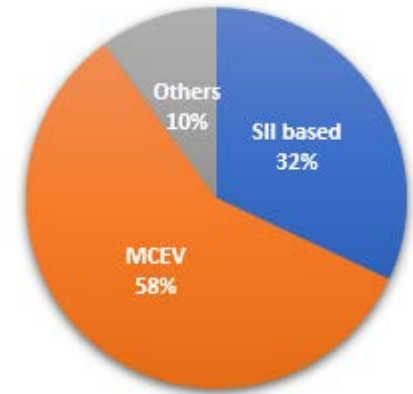- Cost of capital (Coc)
- Value in Force (VIF)
- EEV — Adjusted Net Worth (ANW)

- Present value of future profits (PVFP)
- Required Capital (RC)
- Free Surplus (FS)

1 – Time value of financial options & guarantees
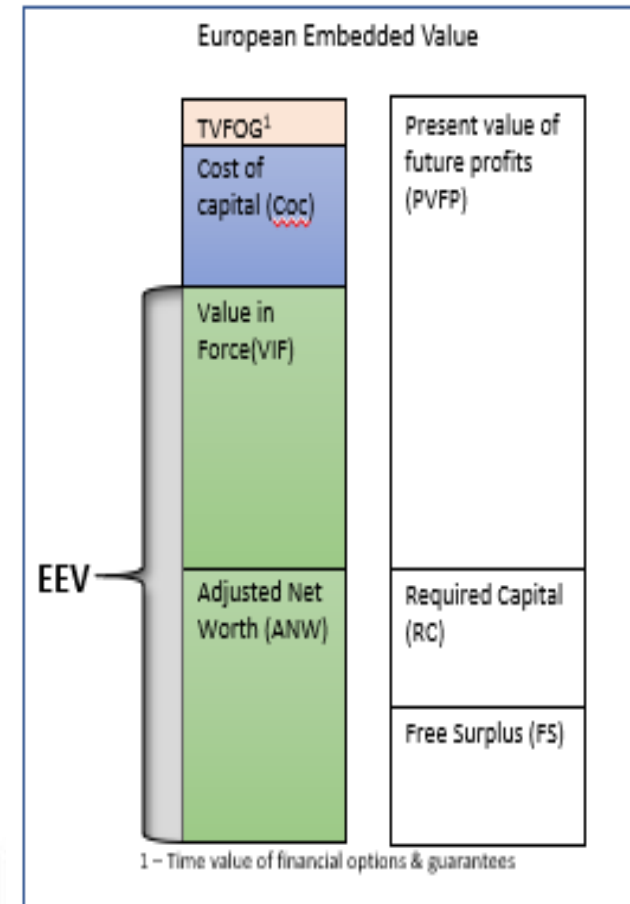
Market Consistent Embedded Value (MCEV)

$$MCEV = ANW + PVFP - FC - TVFOG - CRNHR$$

✓ Frictional Cost (FC) includes investment expenses and tax on investment return on required capital

✓ Value In Force(VIF) = PVFP – FC – CRNHR - TVFOG

Market Consistent Embedded Value

TVFOG[1]	Present value of future profits (PVFP)
Frictional Cost	
CNHR[2]	
Value in Force(VIF)	
Adjusted Net Worth (ANW)	Required Capital (RC)
	Free Surplus (FS)

MCEV

1 – Time value of financial options & guarantees
2 – Cost of residual non hedgeable risks

A Look around us

TEV / EEV
{No formal
disclosures}
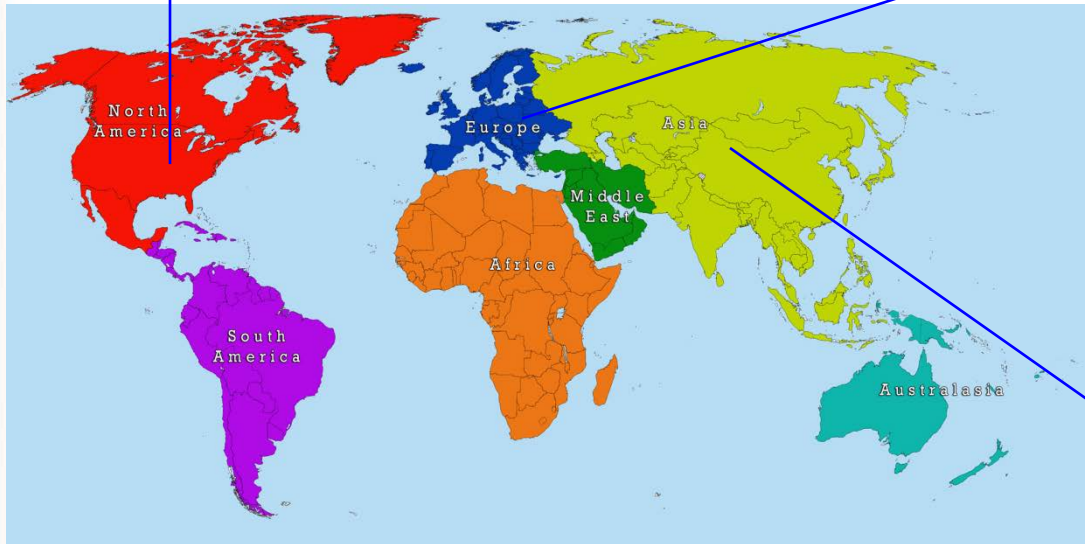
Others 10%
SII based 32%
MCEV 58%

North America

Europe

Asia

Middle East

Africa

South America

Australasia

ASIA

IEV 3%
MCEV 14%
EEV 83%

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MCEV - When & Why?

APS 10 required MCEV implementation in 2015

- ✓ Required for Listing of Life Insurance Companies

- ✓ Higher degree of comparability between results of different companies (Standard format for movement analysis)

- ✓ Reduced subjectivity in the process of producing results (Mark to market basis)

- ✓ Minimum required disclosures for the sensitivities performed.

APS10 Requirements - AoM

Components	Free Surplus	Required Capital	VIF	IEV
Opening IEV				
Opening Adjustments				
Adjusted opening IEV				
Value added by new business during the period				
Expected return on existing business (or unwind)				
Transfers from VIF and RC to Free Surplus				
Variance in operating experience split by major components including mortality / morbidity, policy persistency, etc.				
Change in operating assumptions				
Other operating variance				
Operating IEV earnings				
Economic variances				
Other non operating variance				
Total IEV earnings				
Capital contributions / dividend pay-outs				
Closing adjustments				
Closing IEV				

Starting EV

Attempt to explain the difference

Ending EV

AoM - Live Example

Components (₹ bn)	FY2018	FY2019
Opening EV	**161.84**	**187.88**
Expected return on existing business (unwind)		
At reference rates	10.54	11.39
At expected excess 'real world' return over reference rates	3.19	4.45
Operating assumption changes	**7.64**	**4.20**
VNB added during the period	**12.86**	**13.28**
Operating experience variance		
Persistency	1.53	2.66
Mortality / morbidity	0.78	1.97
Expenses	0.27	0.04
Others	0.00	0.02
EV operating earnings (EVOP)	**36.80**	**38.01**
Economic assumption changes and investment variance	**1.13**	**(1.22)**
EV total earnings	**37.92**	**36.79**
Capital contributions / (dividends paid out)	**(11.88)**	**(8.43)**
Closing EV	**187.88**	**216.23**

Source: ICICI Pru Life (Performance update FY19)

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Market Consistent Valuation - Assets

- ✓ All assets are included at Market Value in the Balance Sheet

- ✓ For assets that are exchange traded, the market prices observed are used

- ✓ For assets where there are no reliable market prices, the value is calculated using arbitrage-free valuation
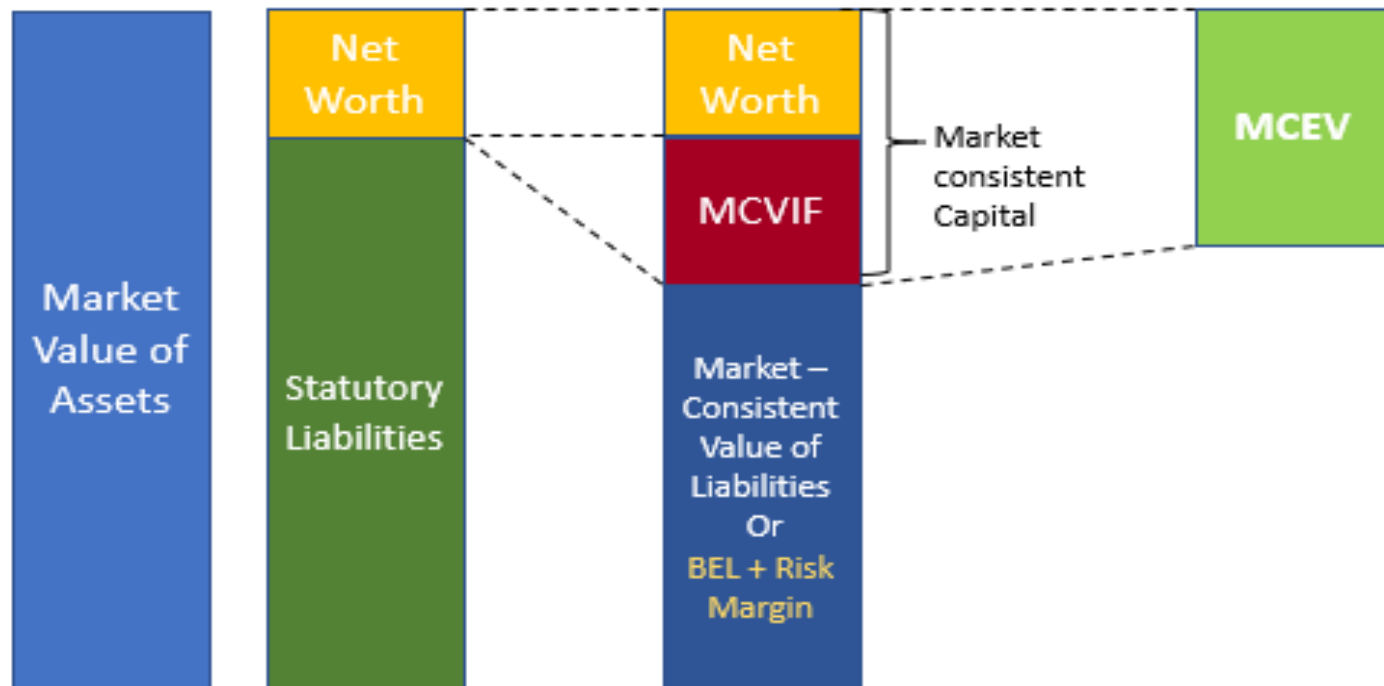
Market Consistent Valuation - Liabilities

✓ The value at which the liabilities could be transferred to a willing & rational counterparty

✓ Calculation: Split in financial and non-financial components:

Financial component : Valuation is determined using capital markets valuation models with reference to the prices and valuation curves (e.g. zero coupon swap Curves)
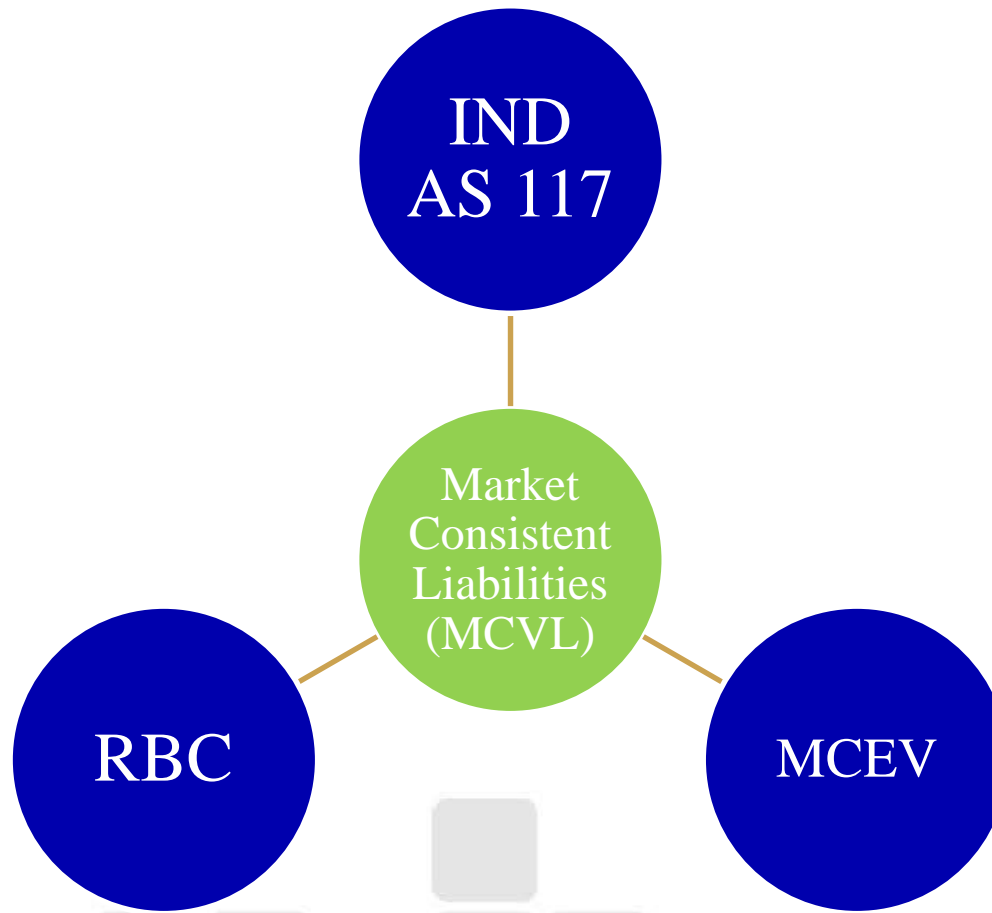
Non Financial component: The risk margins should be kept as a reward that an independent buyer would require for taking the risk
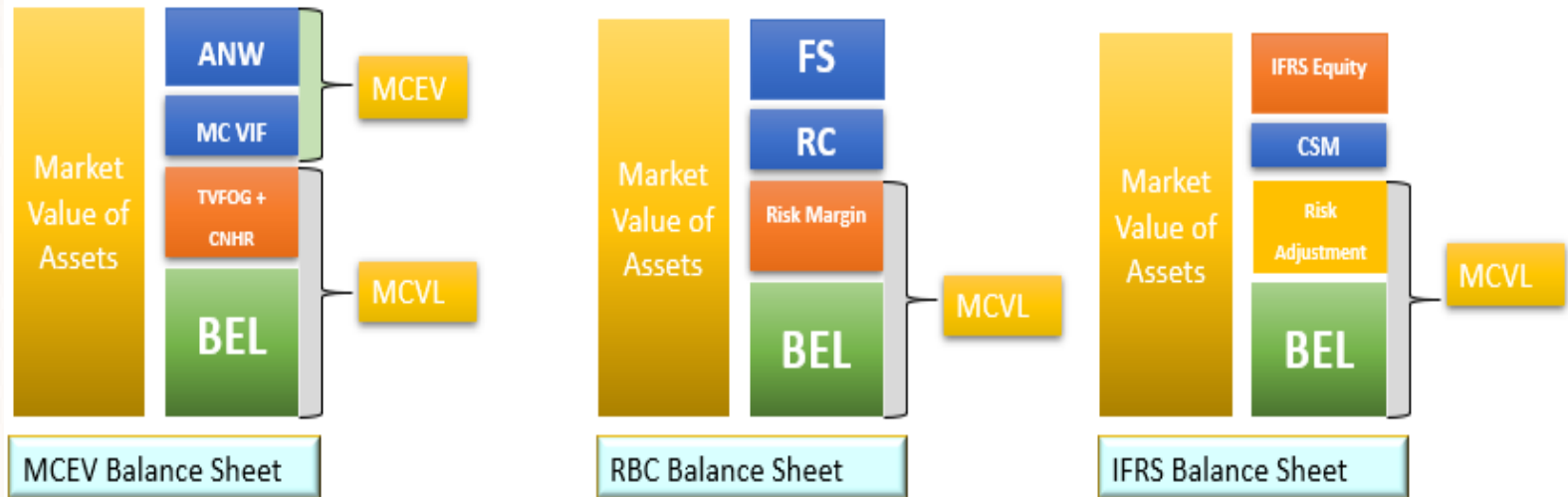
MCEV Constituents :
Market Consistent Liabilities
(MCVL)

MCVL = BEL + TVFOG + CRNHR + FC

MCVL – Common base for various reporting matrices

MCVL – Common base for various reporting matrices

Market consistent valuation – aligned to all above reporting regimes

Why RBC?

✓ Globally, most countries with significant insurance industry are moving to RBC regime

❖ International Association of Insurance Supervisor (IAIS) advocates such change to a global level

✓ IFRS are driving insurance industry to a set of market consistent valuation (MCV)

✓ Government of India also intends to move to IFRS as adopted by Ind-AS for Insurance Industry

❖ RBC regime fits into a MCEV regime as envisaged by IFRS and Ind-AS

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MCVL - Risks

✓ Financial : Interest rate, equity/property, credit default, liquidity etc.
✓ Non-Financial : Mortality/longevity, catastrophe, persistency & mass lapse

	Financial	**Non financial**
Hedgeable	Allowed for at current market price • No credit for investment spreads • Present Value of Future Profits and Time Value of Options & Guarantees reflects market price of hedging risks	To the extent they exist should be allowed for at current market price
Non hedgeable	Allowed for in Cost of Residual Non Hedgeable Risks (to the extent not allowed for already in PVFP and TVFOG)	Allowed for in • Present Value of Future Profits • Time Value of Options and Guarantees • Cost of Residual Non Hedgeable Risks

MCVL – Best Estimate Liabilities

✓ 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

MCVL – Best Estimate Liabilities

✓ Calibration of risk free curve, liquidity premiums- the parameters to be approximated as Indian market not being deep and liquid.

✓ Most common risk free curves used in INDIA are sourced from

Curve	Companies
CCIL	ICICI Prudential, HDFC, TATA AIA
FBIL (FIMMDA)	SBI, Kotak, Max

MCVL: Time Value of Options & guarantees

✓ 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 time value of options and guarantees is needed to assess the asymmetric impact on shareholder value.

MCVL: Time Value of options & Guarantees

Stochastic modelling for valuation of options and guarantees
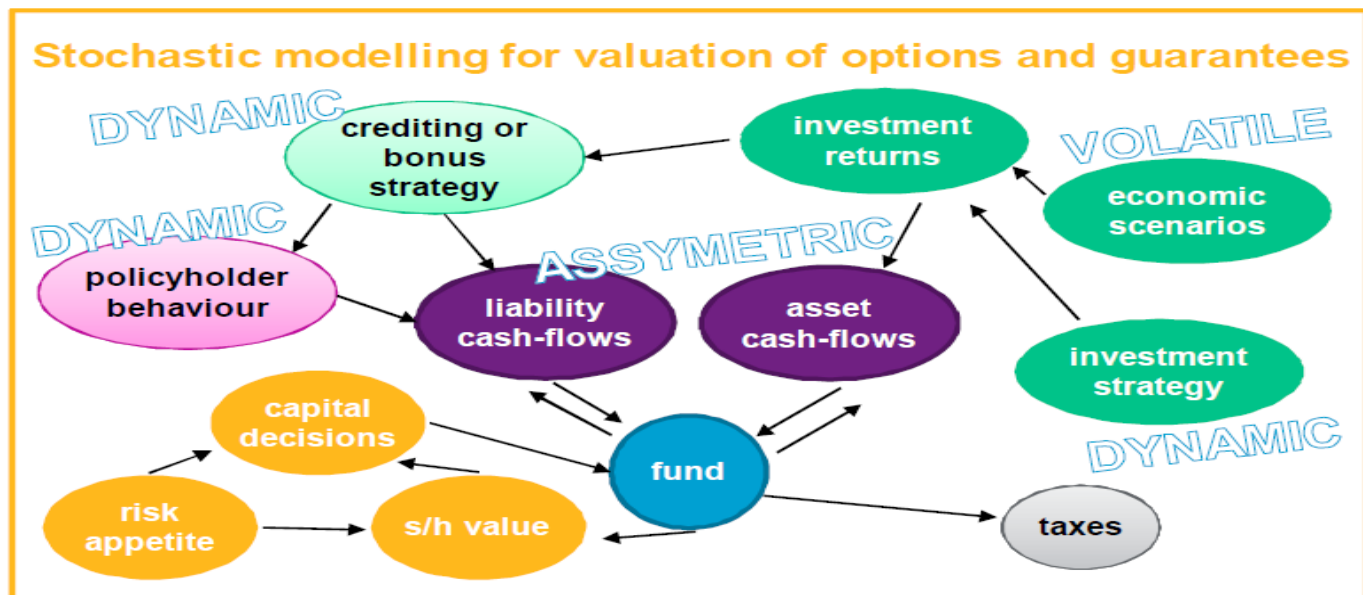
MCVL : Frictional Cost

- ✓ Reflects the "rupee" cost of holding required capital in the insurance business comprising:
  - ▪ Investment expenses incurred on assets backing required capital;
  - ▪ Tax on investment returns
- ✓ DO NOT include :
  - ▪ Agency cost
  - ▪ Costs of financial distress
  - ▪ Any opportunity cost of capital or 'Lock-in' costs
- ✓ Measured from a shareholder perspective over the lifetime of the underlying risks

- ✓ Allowed explicitly

MCVL: Cost of residual non hedgeable risk

✓ Process for identifying risks eligible for CRNHR:

- ▪ Mean outcome may not produce the mean of shareholder outcome - for eg: non-proportional reassurance, deterministic modelling
- ▪ Risk not included ? Operational, mass lapse, catastrophe
- ▪ Asymmetries not allowed for in TVFOG ; taxation ?
- ▪ Interdependencies : Correlations? Policyholder behaviour?
- ▪ Non-hedgeable financial risks: Deep and liquid market ?
- ▪ Allowance for uncertainty: Inability of fully diversify diversifiable risks.

MCVL: Cost of Residual non-hedgeable risk

✓ Stress tests on PVFP

✓ Risks not allowed for elsewhere : For eg : Operational, catastrophe risks – allowance can be made on internal economic capital modelling

✓ Can be calculated applying cost of capital parameter say 5% per annum, to run-off. Choice of parameter is discretionary?

✓ Choice of method to allow for the cost – subjective ?