

Economic capital

A Preamble

CILA August 2009

Economic Capital (EC) is taking an increasing importance within the insurance industry. The EC and MCEV committee of IAI submitted a report covering various definitions and methodologies

- **Group formed under the chairmanship of Dr. Kannan**

- **Group members**

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- **Report presented to the President, IAI and circulated to members of IAI**

Economic Capital – What is EC?

- Required Capital and different from Regulatory Capital
- Required under economic accounting convention where assets and liabilities are measured based on economic principles
- Different from regulatory capital
 - EC based on specific risks of the company
 - Regulatory capital is based on industry averages
- Economic Capital can be defined as sufficient surplus to cover potential losses at a given risk tolerance level over a specified time horizon

Economic Capital – Key Decisions

- **Time Horizon**
- **Measure of risk**
- **Types of risk to be considered**
- **Quantification methodology**
- **Aggregation/diversification**
- **Target level of security**
- **Risk neutral Vs Real world**

Economic capital Key decisions

- **Time Horizon**
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Time Horizon – Variety of approaches but there are two common approaches in practice

- **One year or Liability run-off**

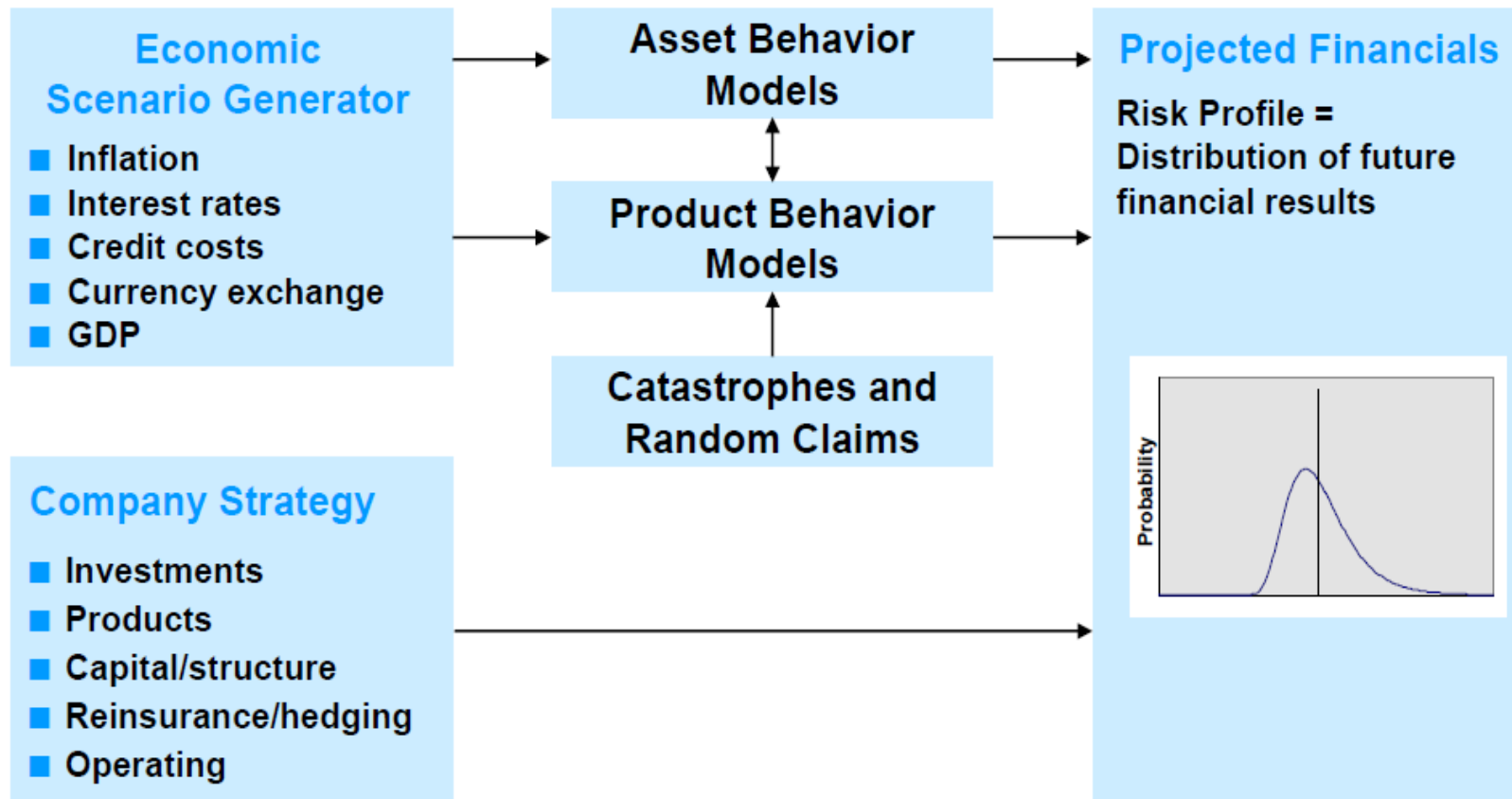
Liability run-off approach:

The level of total initial assets, less some measure of reserves for liabilities, required to pay all future policyholder benefits at the chosen confidence level

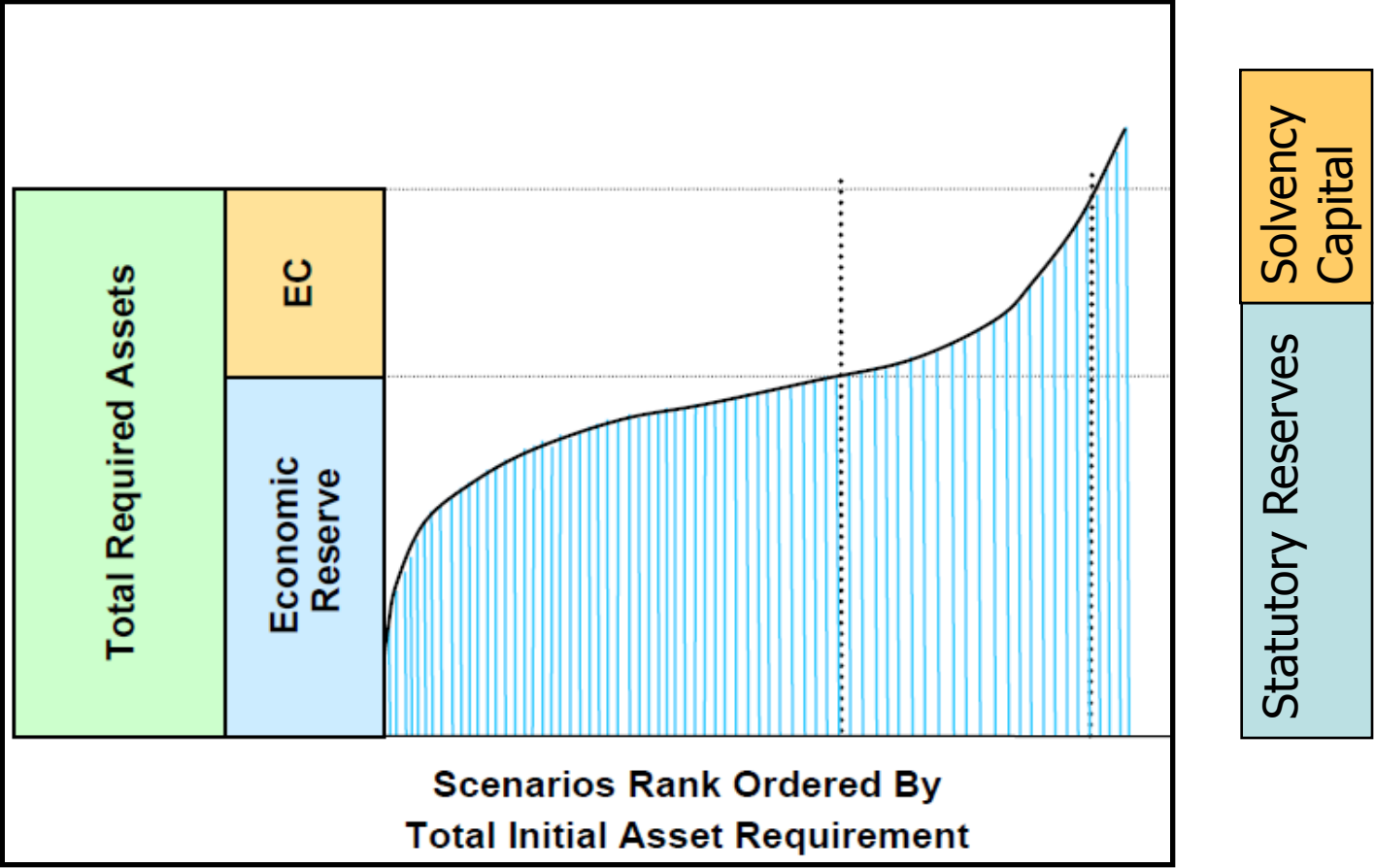
One year approach

The level of assets, in addition to the market value of liabilities, needed to cover a fall in the market value of net assets over a one-year time horizon at the chosen confidence level

With a liability runoff approach, a real world stochastic projection basis is frequently used



EC is derived from the distribution of resulting distribution of required initial assets



With a one-year approach a stress test is frequently used

- Assets are measured at market value; liabilities are measured on a best estimate basis, i.e., all prudence is removed
- Separate stresses are applied to cover a variety of market, credit and insurance risks
 - The stress tests applied are each calibrated to a probability level over a one-year time horizon, consistent with the target financial strength rating
- Results are aggregated using a correlation matrix approach

Ease of implementation, communication, risk profile of the business, ease of stress calibration and management action calibration – forms basis for selecting the approach

As per survey conducted in US:

- 56% of the companies use one year approach
- 14% of the companies use liability run-off approach
- 30% of the companies use other approaches

Source: Tillinghast ERM Survey

Economic capital Key decisions

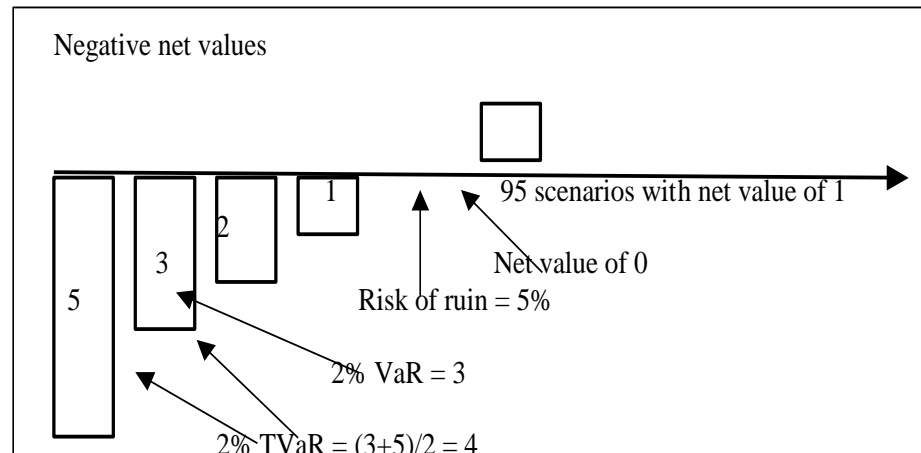
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Measure of risk

- VaR or T-Var
 - Coherent measure
 - Communication and implementation
 - Consistency with other financial institutions
 - Ease of calibration

- 67% of respondents use VaR as the primary risk margin
- Use of VaR is relatively constant across large (75%), medium-size (69%) and smaller (61%) companies.

Source: Tillinghast ERM Survey



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Types of risks to be included

- Insurance risk

Mortality

Persistency

Morbidity

Expense

- Credit risk

Corporate bond

Counterparty Default

- Market risk

Interest rate

Forex

Equities

Property

- Liquidity risk

Risks Includes by Life Insurers

- Life Insurance Risks included in EC Calculations
 - Mortality – 92%
 - Lapse / Surrender – 84%
 - Longevity – 74%
 - Expenses – 73%
 - Policy holder behavior – 50%
- Financial Risks included in EC calculations
 - Interest rate – 97%
 - Equity– 81%
 - Credit (asset default) – 80%
 - Credit (counterparty) – 63%
 - Property or real estate– 51%

Source: Tillinghast ERM Survey

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Quantification methodology

- **Stochastic simulations**
 - **Stochastic method is commonly used along with the liability run-off approach but can also used with one year approach**
- **Stress testing**
 - **Stress testing is most commonly adapted with one year approach**
- **Factor based**
 - **These approaches have been used for some risks faced by the insurers such as credit risk, liquidity risk and operational risk where companies face modeling challenges**

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Aggregation/diversification

- Simple aggregation likely to materially overstate capital requirements
- Types of diversification
 - With-in risk
 - Across risk categories
 - Group- across entities
- Methods of diversification
 - Stochastic
 - Correlation matrix

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Target level of security

- **Linked to duration of risk**
- **Calibrated to a certain rating with stakeholders**
 - **Regulators**
 - **Rating agencies**
- **Methods of diversification**
 - **Stochastic**
 - **Correlation matrix**

Target Security Level

- No prescribed way to select a target level
- Based on certain characteristics of insurer and corporate bond default experience
- Longer the term the default probability increases
- Similar approach is considered as reasonable for insurance policy holders – higher security over full term of their policies to shorter term policyholders than long-term policy holders

Over one year period the target level of 99.95% target is comparable to 94% target over 20 year period

This method is sometimes criticized for default data being relevant to insurer's financial strength

Implementation of Economic Capital

- Risk Modeling is critical
- Approaches depend on nature of risks and availability of data
- Other factors are also to be considered in implementing Economic Capital

Key issues for India

- **Pragmatic reserving basis**
- **Level of security and calibrations**
- **Expense overruns**
- **Capability and comparability**

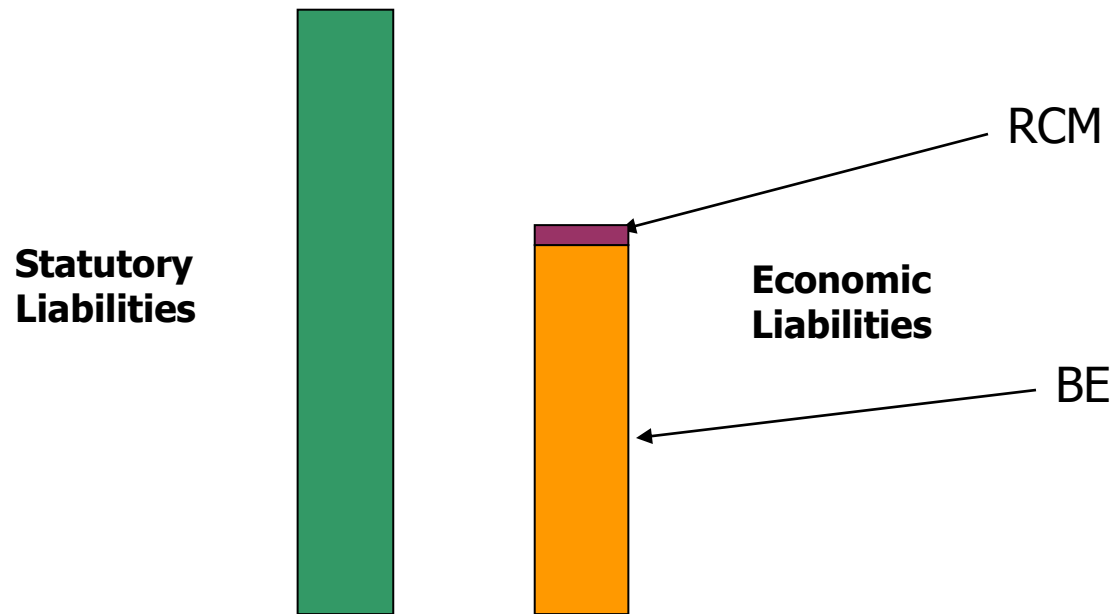
Pragmatic reserving basis

- **Need to develop a working reserving basis for solvency purposes. Can be thought of as sum of**
 - **Best estimate provisions**
 - And**
 - **Risk capital margin**

The working reserving basis does not fit totally with the General Purpose reporting standards e.g. IFRS

Pragmatic reserving basis

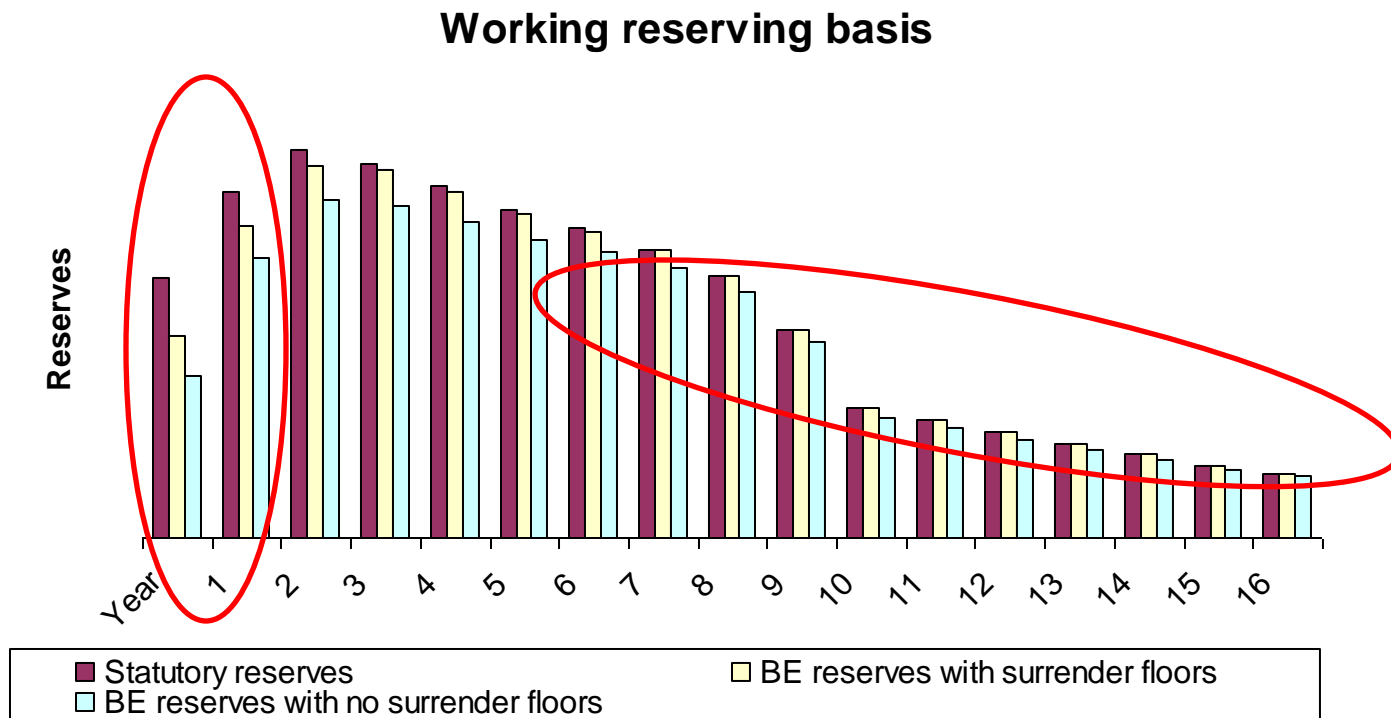
- Initial reserve profile for typical UL business with approx 3 years as the average portfolio duration



- Removal of MADs for best estimate valuations
- Cost of holding future solvency margins added on top as Risk capital margin

Pragmatic reserving basis

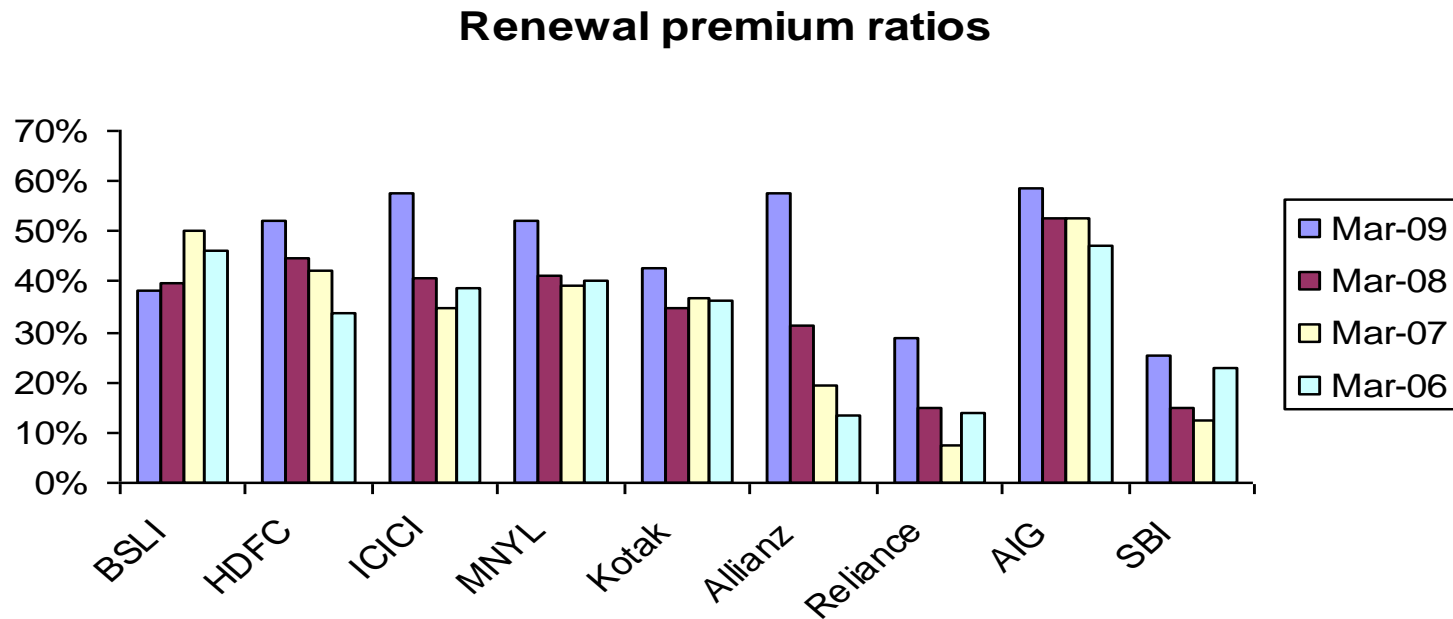
- Run-off reserve profile for typical UL business in India



- Implied margins in reserves get thinner as business matures

Pragmatic reserving basis

- Renewal premium ratios for Indian Life insurers

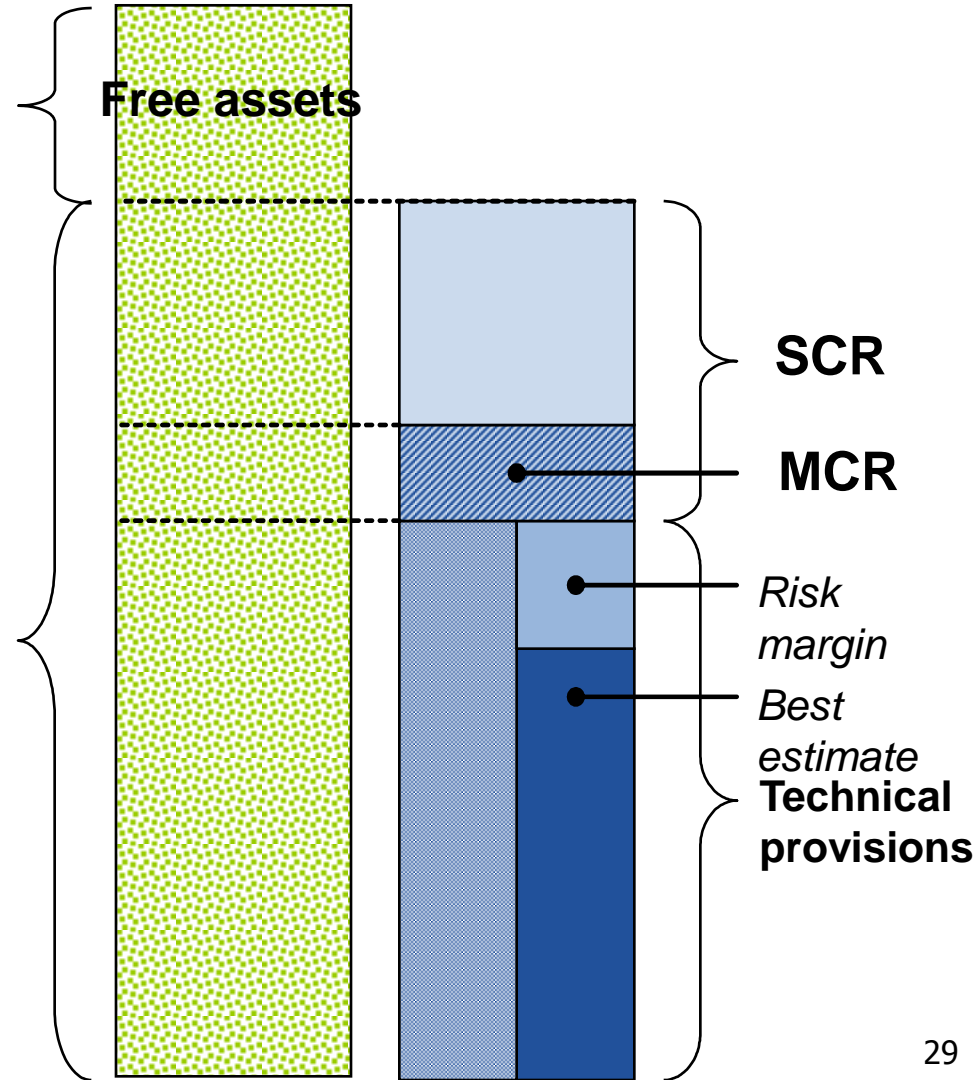


Key issues for India

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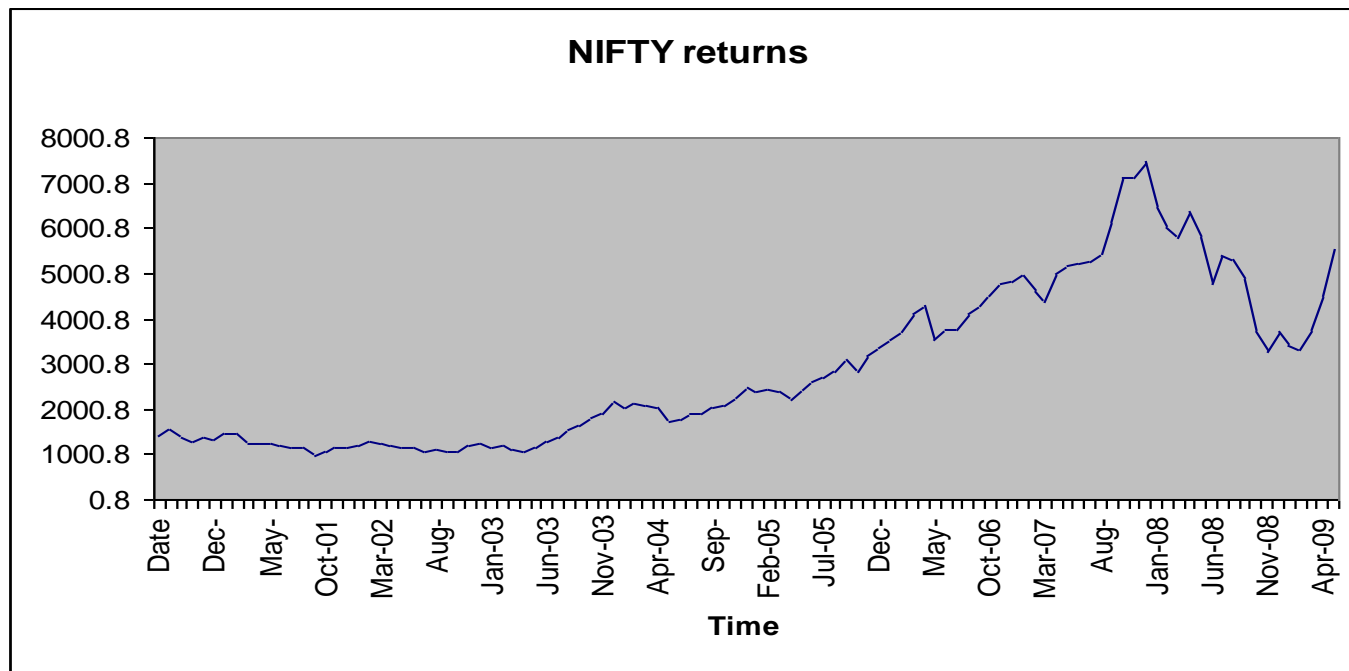
Level of security and calibrations

- Regulatory solvency measure
- Internal economic capital measure
- MCR measure



Level of security and example calibrations

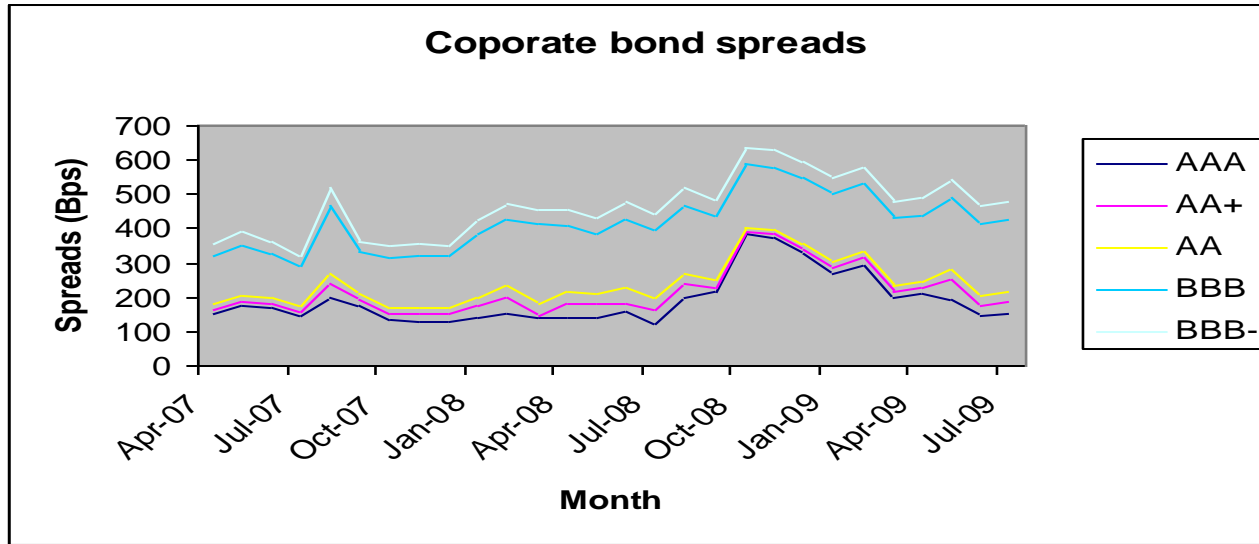
- 99.5 percentile Solvency 2 measure calibrates to BBB rating
 - P/H security level in India
 - LIC already regarded with a sovereign guarantee
- Equity calibrations



- 99.5% VAR corresponds to an annual equity decline of 60%

Level of security and example calibrations

- Corporate bond spreads



- Increase in spread to the tune of 300-400 bps in 99.5th percentile

Level of security and example calibrations

- Insurance risk calibrations

- Mortality/Morbidity

Level

Volatility

Trend

Catastrophe

- Maintenance expenses

- IAA approach

0.75% of Liability

- Solvency 2 QIS 4

10% increase in expenses along with
1% inflation

- Persistency

- Short term lapse shock

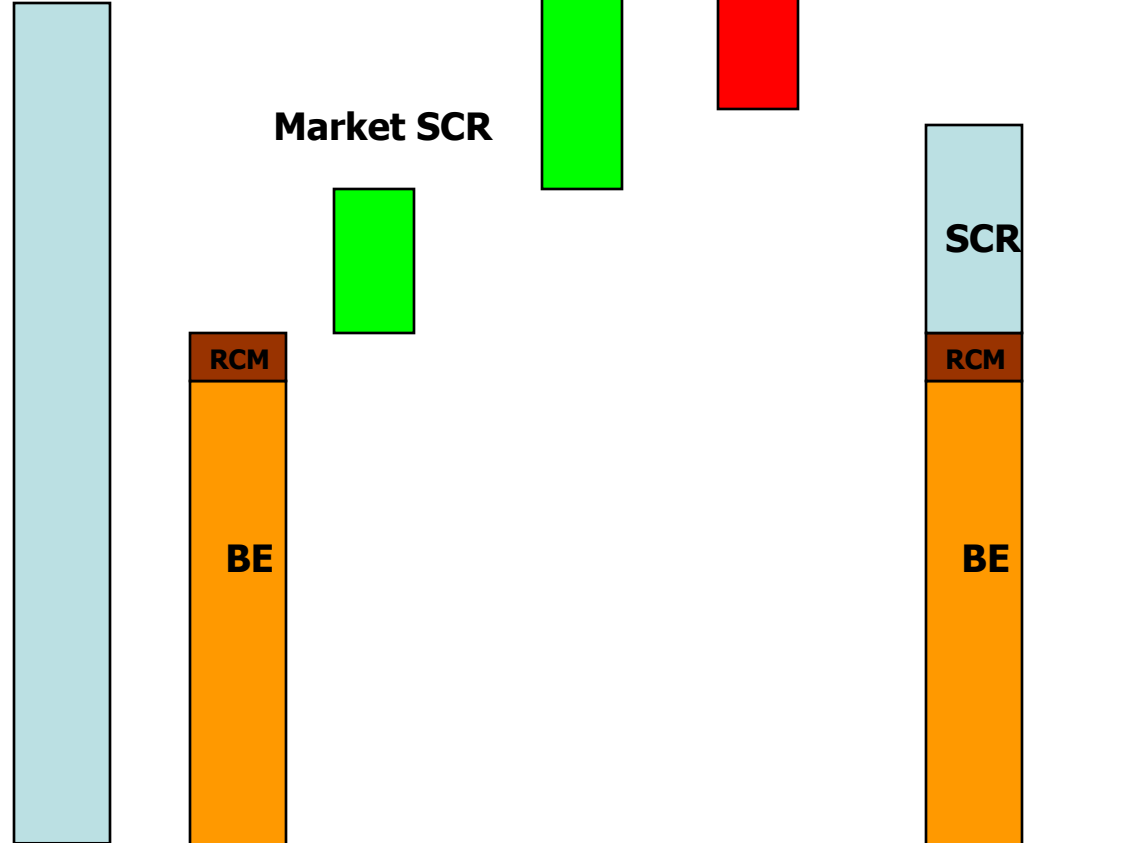
- Long term change in assumptions +/-50% for Solvency 2 QIS 4

Level of security and example calibrations

- **Operational risk**
 - **Weakest area identified in several surveys**
 - **Generally set an overall basis as a % of risk driver(s)**
 - **QIS4 25% of ULIP administrative expenses**
 - **1% of liabilities**

Level of security and calibrations

Interest rate	1,376
Equity risk	3,312
Market SCR (Post correlation)	3,586
Mortality	3,150
Lapse	2,668
Expense	5,320
Catastrophe	1,024
UW SCR (Post correlation)	7,594
BSCR	9,174
SCR op	1,034
SCR	10,208



Economic assets **Technical provisions**

Key issues for India

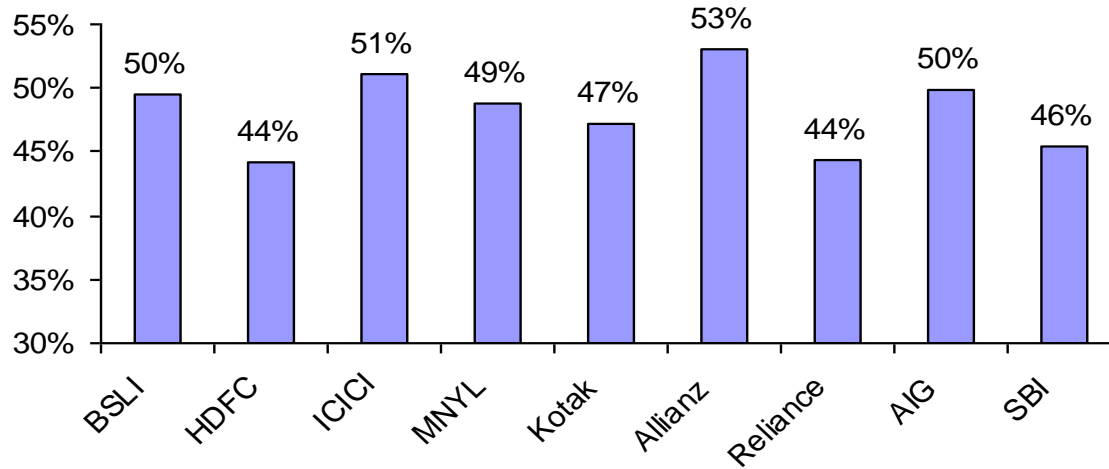
- **Pragmatic reserving basis**
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Expense overruns

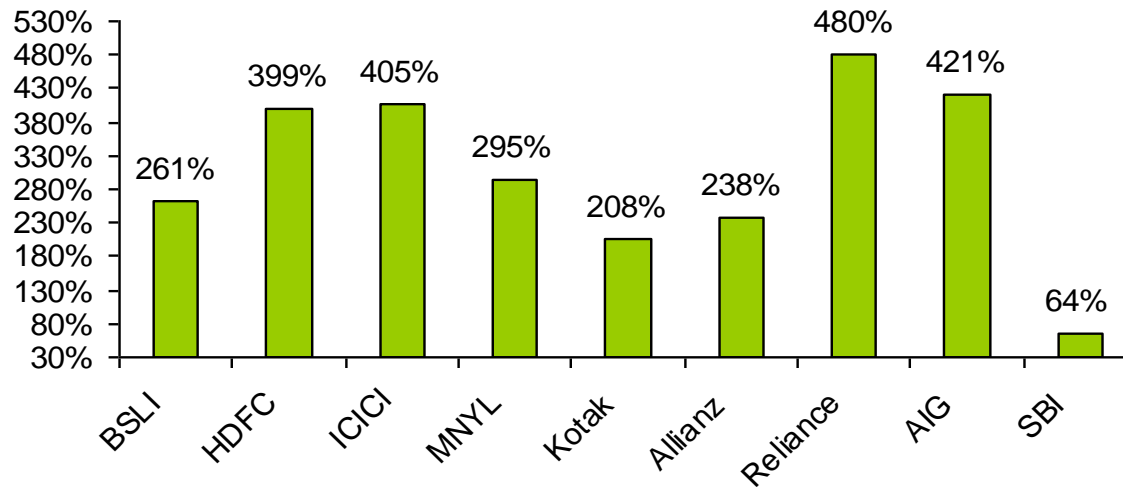
- **Most Indian companies still not in a structural expense position**
- **Regulatory regimes generally do not explicitly mention about acquisition expenses over a shorter term**
- **Solvency 2 Pillar II mentions capital add-ons based on supervisory or internal review**

Expense overruns

Salaries and rents as % of total expense



Total opex to Shareholder investments ratio



Key issues for India

- Pragmatic reserving basis
- Level of security and calibrations
- Expense overruns
- Capability development

Capability development

- **Economic capital survey planned**
 - **Technicality**
 - **Capability**
 - **Comparability**
 - **Acceptability**

Disclosure

The views expressed here are in our professional capacity and do not necessarily reflect our respective employer's opinion

Thank you