nmg CONSULTING

SHAPE YOUR THINKING

Creating value from your capital model

31st May 2013

Presentation to 5th General Insurance Conference "Listen and be Heard"

Contents

- Introduction to Capital Modelling
- Capital Modelling in Singapore, Malaysia and the region
- Creating Value
  - What can your capital model do for you?
  - Bolt-ons to your capital model
- Should Capital Models be mandated or simply encouraged?
  - Case Study: Solvency II (UK)
- Conclusions

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Capital Modelling

What is capital and why do we need to worry about it…

- Currently in the industry, there is an increasing focus towards capital (the strength of the Balance Sheet), away from just the P&L
- Globally capital modelling is becoming increasingly more 'embedded' within General Insurance
- In Europe, ERM has been a motivation for using internal models, but Solvency II has been a driving force
- In other jurisdictions, such as the US, rating agency capital is becoming increasingly more important
- How can companies create value from their capital models for strategic business decision making purposes?

What are Capital Models?

1. To **simulate risks** of an insurance company
2. To derive **future capital requirements** over **specified timeframes** and **specified levels of confidence**
3. Ideally **constructed stochastically** instead of deterministically to sample statistics from a **range of generated outcomes**
4. Typically include **modelling of Assets and Insurance Liabilities**

Typical Features of Capital Models

1

Used to model extreme events

- Stress-to-Failure scenario
- Prescribed events by the regulators

2

Mostly deterministic

- Unable to model less extreme outcomes unlike stochastic model

3

Projections

- Quarterly projection intervals for Malaysia
- Annual projection intervals for Singapore

4

Level of granularity

- Modelling performed at line of business level, and aggregated to entity level

5

Simplistic parameters

- No distributions
- No correlations

Different Types of Capital

Types of Capital for insurance companies

Regulatory Capital

- What level of risk can society accept?
- What happens to the company if its capital falls below this level?

Rating Agency Capital

- What is the external perspective of the riskiness of the company?

Management/ Economic Capital

- What is the Risk Appetite of the Company's Management?

Purpose of Capital in insurance companies

- Meet policyholder's obligations when premiums have proved insufficient
- Confidence in a company
- Meet the regulator's requirements

Different Types of Capital

Types of capital for

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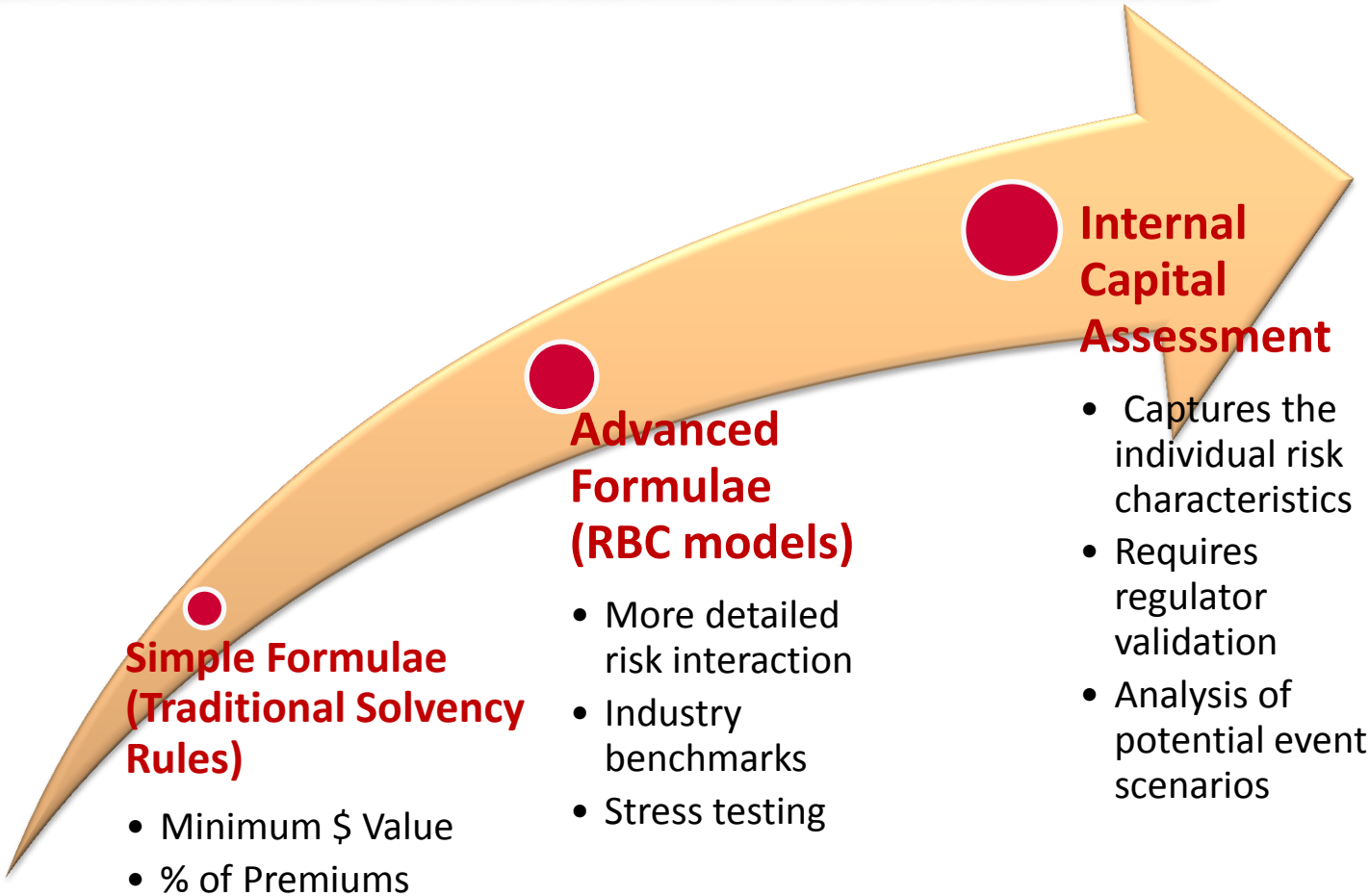
Evolution of regulatory capital



Simple Formulae (Traditional Solvency Rules)

- Minimum $ Value
- % of Premiums
- % of Reserves
- Focus solely on liability side of the balance sheet

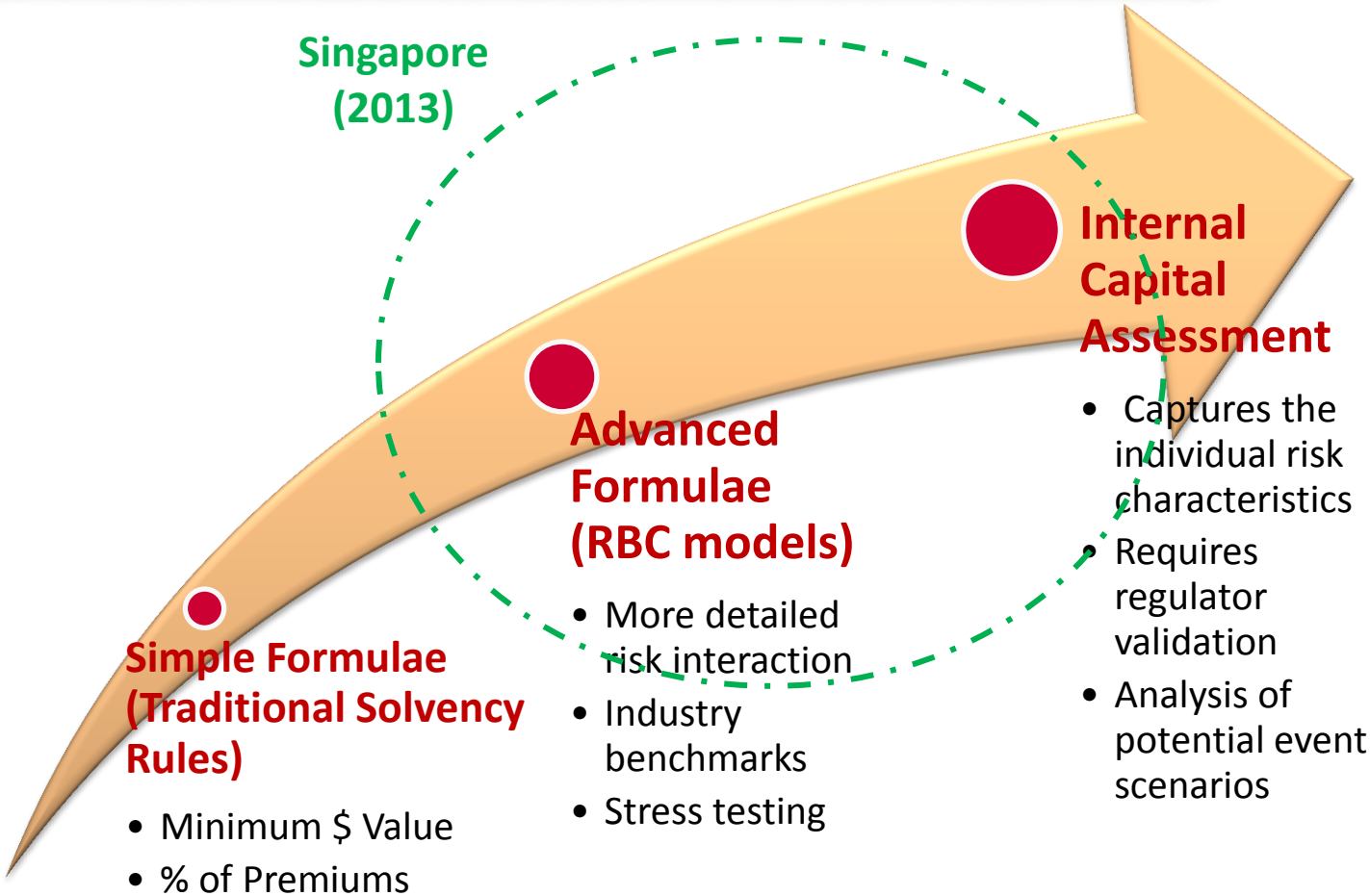
Advanced Formulae (RBC models)

- More detailed risk interaction
- Industry benchmarks
- Stress testing

Internal Capital Assessment

- Captures the individual risk characteristics
- Requires regulator validation
- Analysis of potential event scenarios

Evolution of regulatory capital



RBC in Singapore – The Future

In the light of evolving market practices and global regulatory developments, MAS is reviewing the risk-based capital (RBC) framework for insurers in Singapore. The review ("RBC 2 review") aims to improve the **comprehensiveness of risk coverage and risk sensitivity** of the current framework and defining the **MAS' supervisory approach to the solvency intervention levels**.

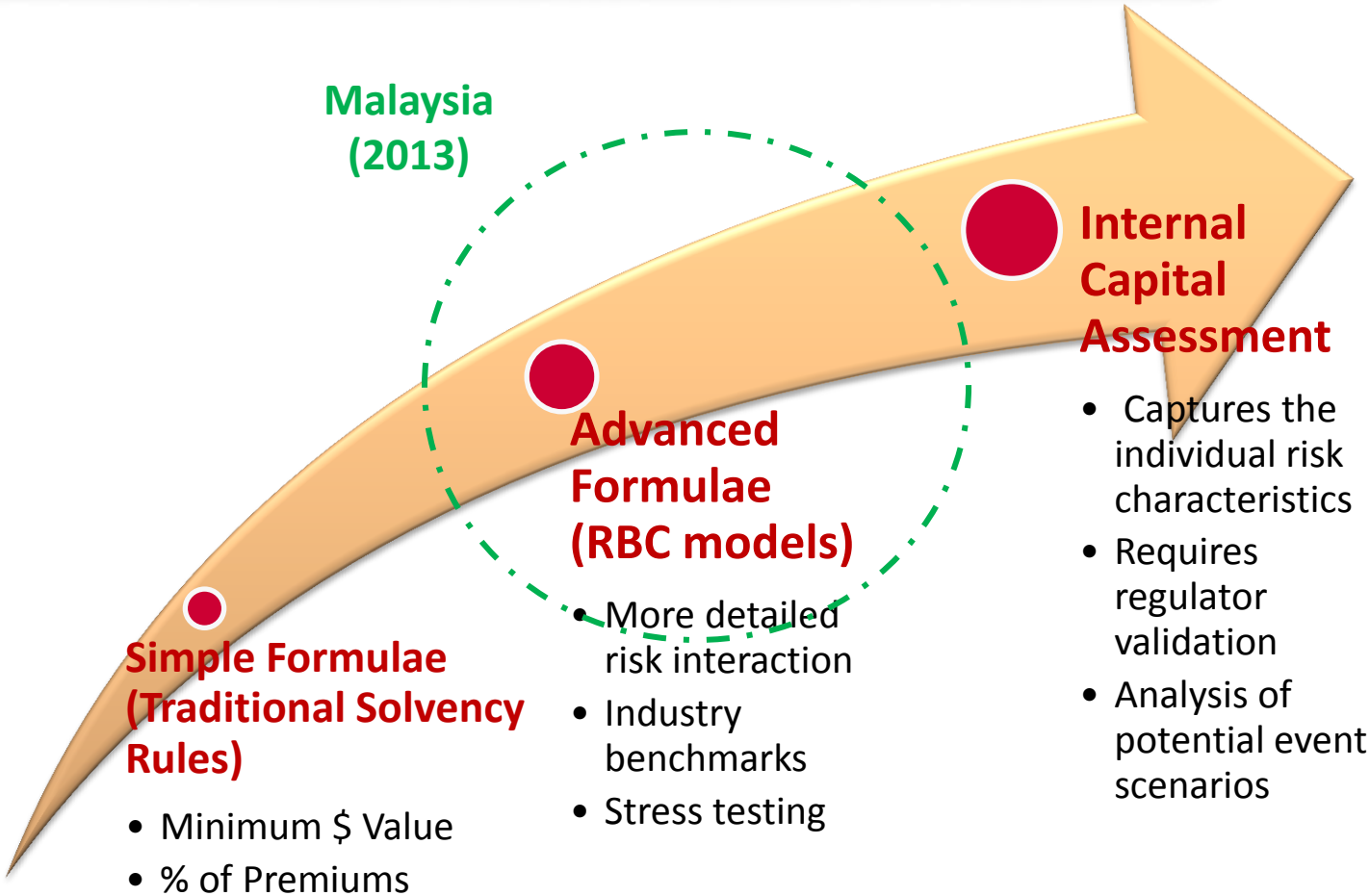
RBC 2 review

- Currently under consultation with MAS
- Primarily recalibration as opposed to structural changes
- Expected to be implemented for the 2013 year-end

Own Risk Solvency Assessment (ORSA)

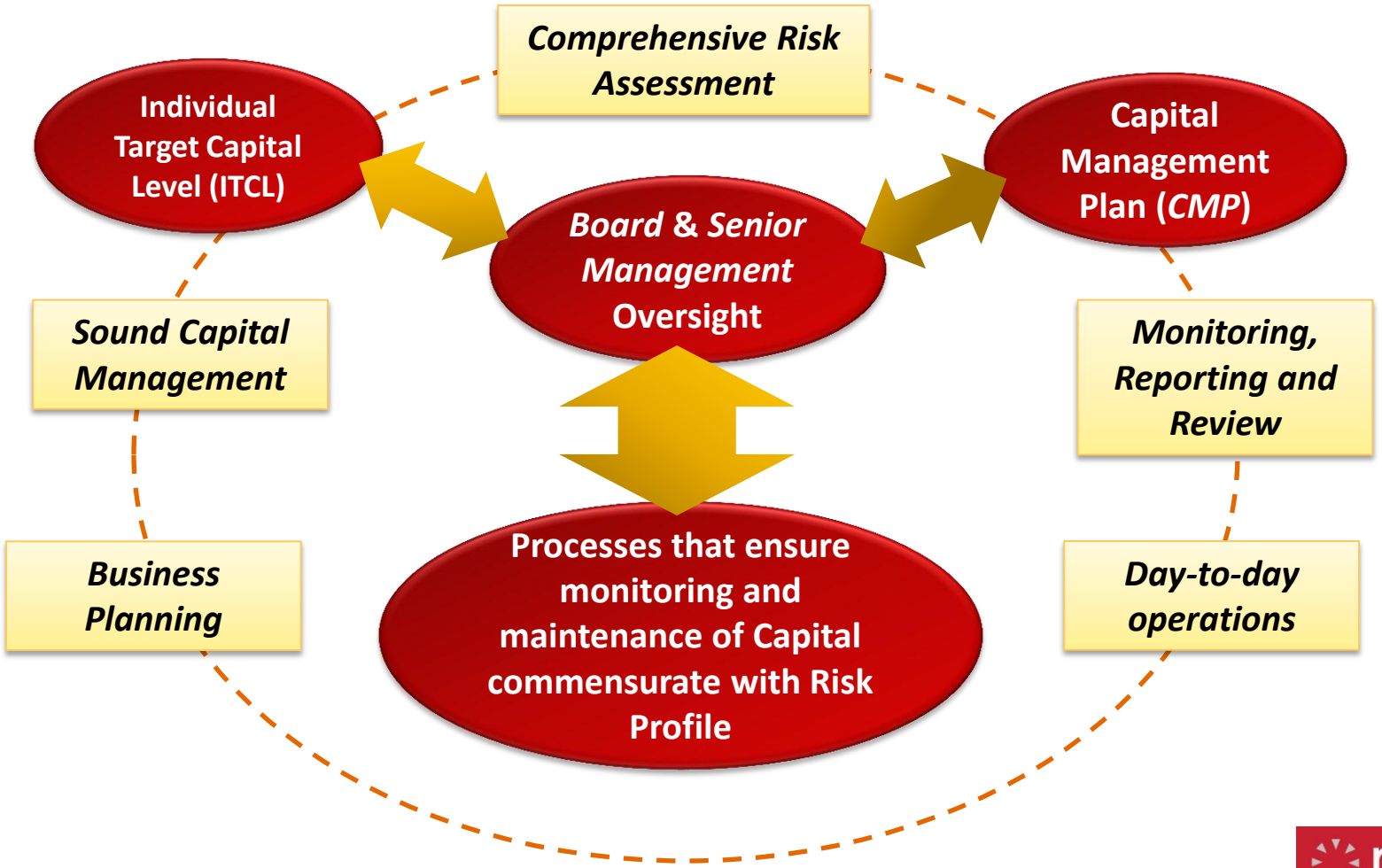
- Part of the proposed Enterprise Risk Management (ERM) Framework
- Similar to UK Solvency II ORSA
- Takes into account insurer's Economic Capital Requirement and MAS's Regulatory Capital Requirement
- Include self-selected scenarios, inc. Stress-to-Failure scenario
- Responsibility of the Board of Directors and senior management
- Proposed implementation date: 1 January 2014

Evolution of regulatory capital



ICAAP in Malaysia

Internal Capital Adequacy Assessment Process



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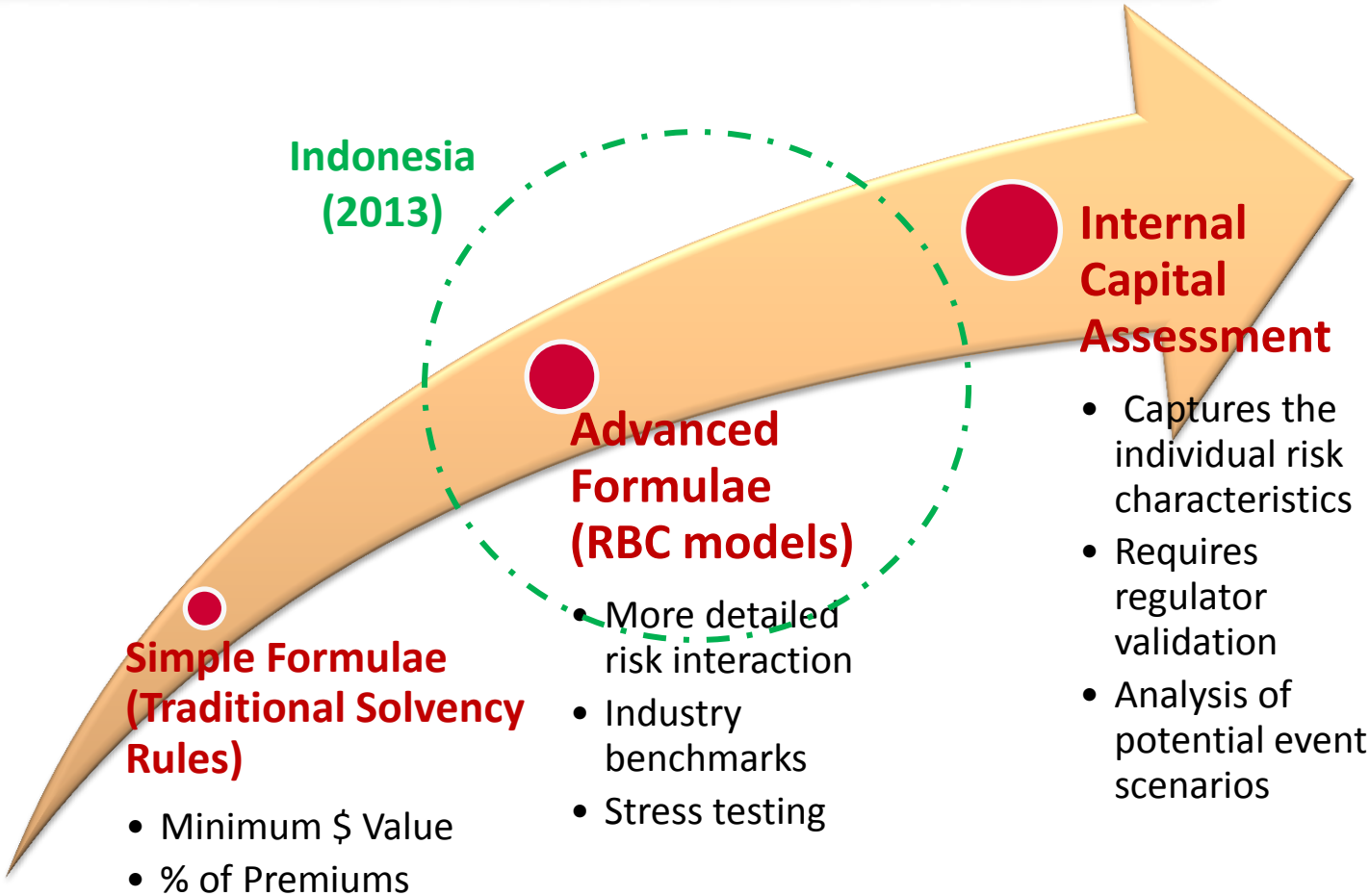
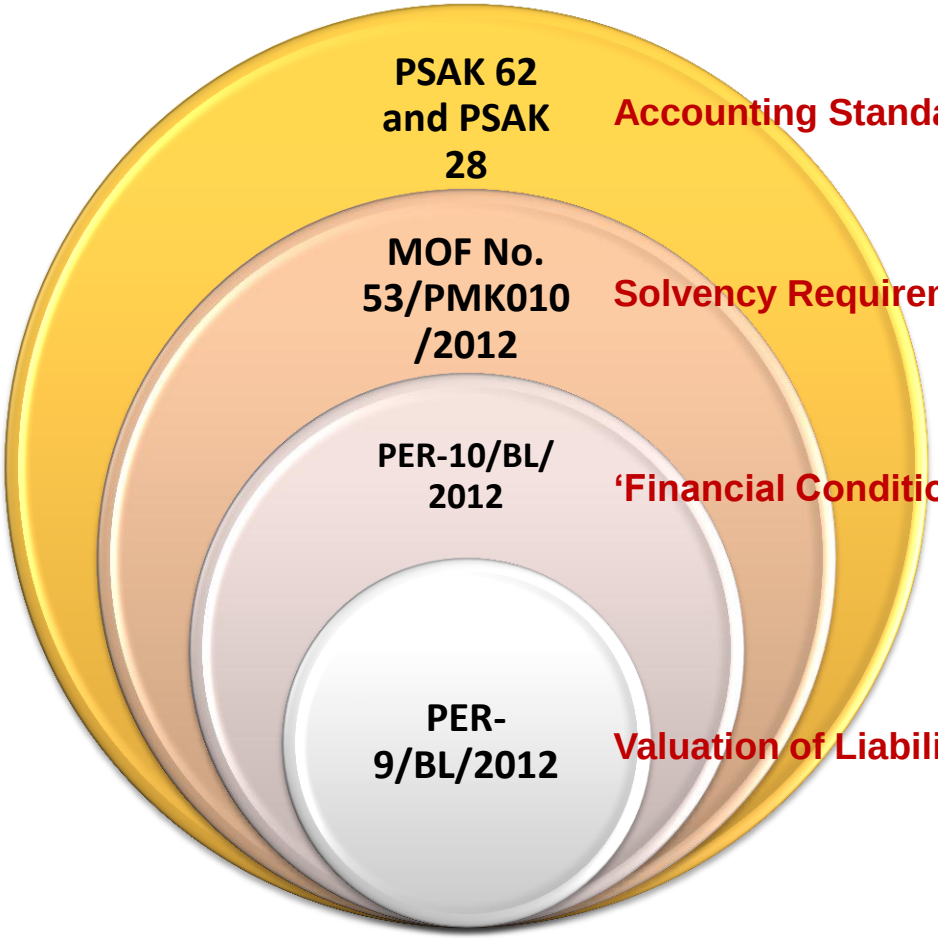


Indonesian FCR



Indonesia – Overview of PER-10

Insurance and Reinsurance Company Actuarial Report (PER-10/BL/2012) effective 1 June 2013

1

Explicit Sign-Off on Actuarial Report

- Sign-off by Actuary
- Sign-off by Board of Directors

2

Data Quality

- Explain data accuracy, reliability, procedures to ensure data is the complete and credible

3

Business Overview

- Product lines
- Target Market
- Distribution Channels
- Human Resources
- IT

4

Financial Health & Capital Adequacy

- Capital Level (last 5 years) and past events that affect capital

Indonesia – Overview of PER-10

Insurance and Reinsurance Company Actuarial Report (PER-10/BL/2012) effective 1 June 2013

5

Projections of Capital Levels

- Min. projection (5 years)
- Analysis of Experience (incl. Actual vs Expected)
- Perform Stress Test
- Access to capital requirement

6

Pricing analysis

- Review pricing if there are changes in assumptions or premiums
- Profitability analysis:
  - All products
  - 5-year historical and projected

7

Liability Valuation

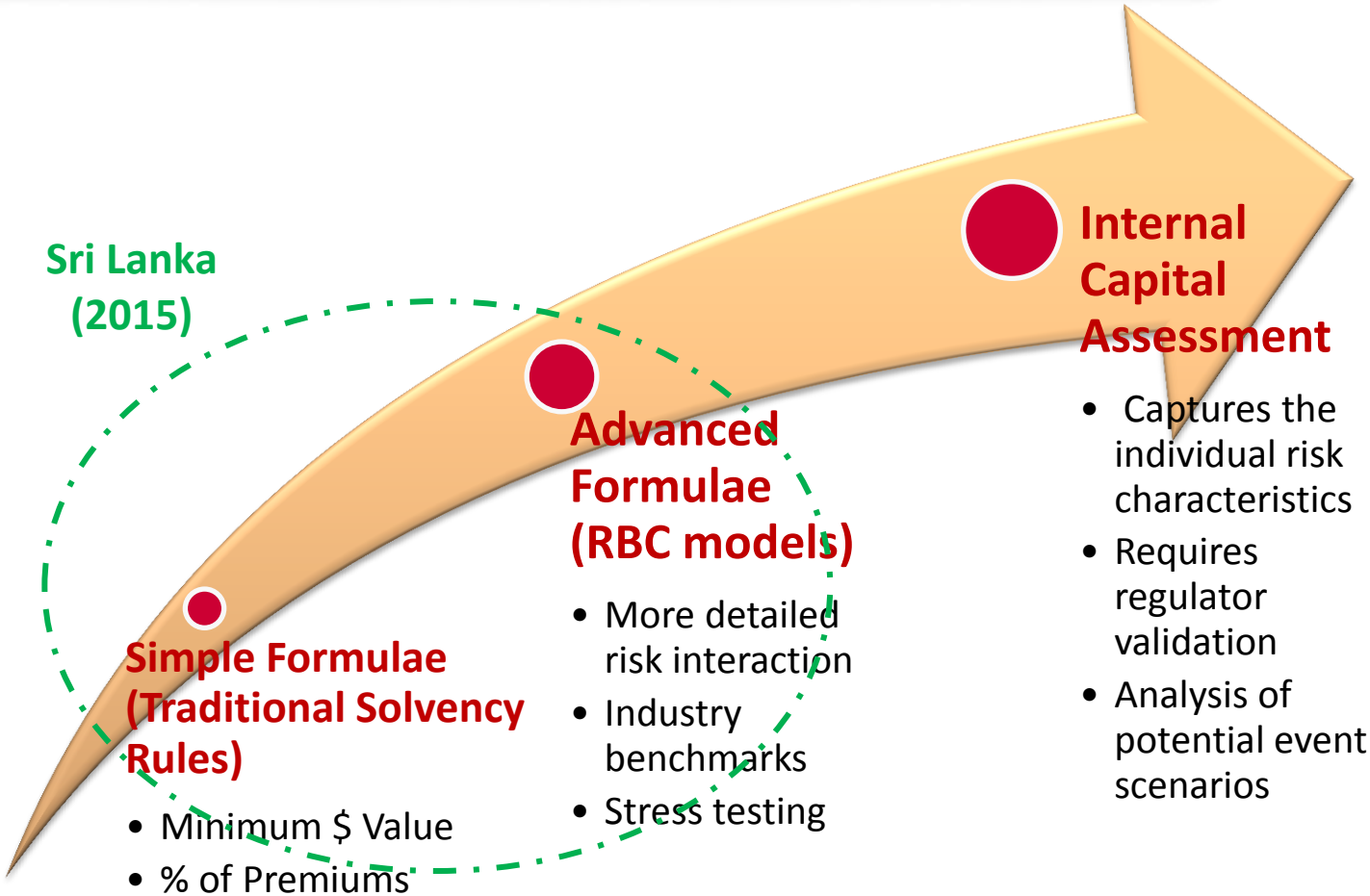
- Methodologies, assumptions and calculations of technical reserves
- Actuary's opinion on selections

8

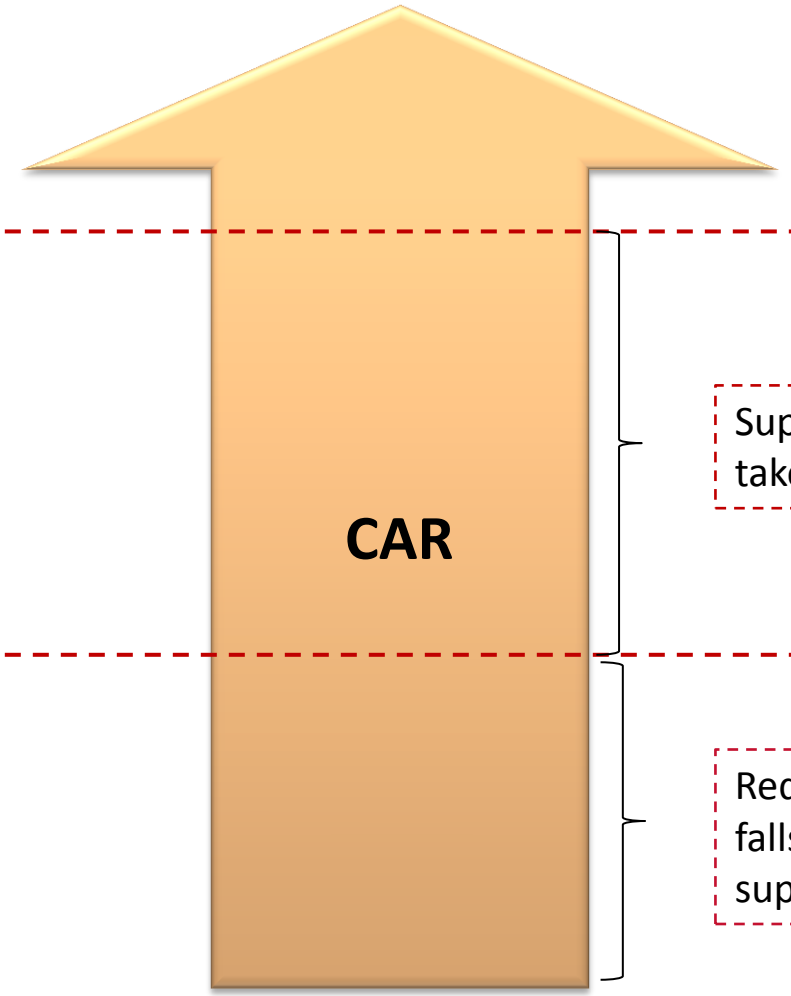
Asset Liability Management

- Valuation of Asset analysis
- Portfolio Diversification
- Asset liability matching:
  - Rate of return
  - Duration
  - Liquidity

Evolution of regulatory capital



Sri Lanka – Capital Adequacy Requirements



Supervisory target CAR = 120%

Supervisory actions of increasing intensity will be taken to resolve financial position of insurer

Statutory Absolute Minimum Capital Required (MCR) = LKR 500 million

Required to be maintained by insurers at all times. If falls below pre-specified level, an appropriate supervisory action will be initiated

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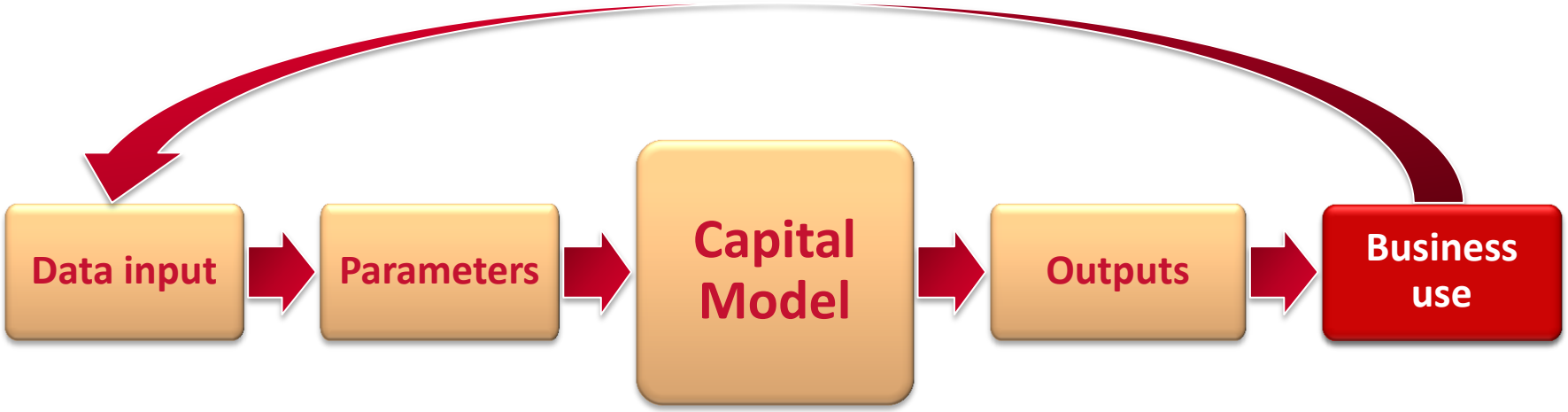
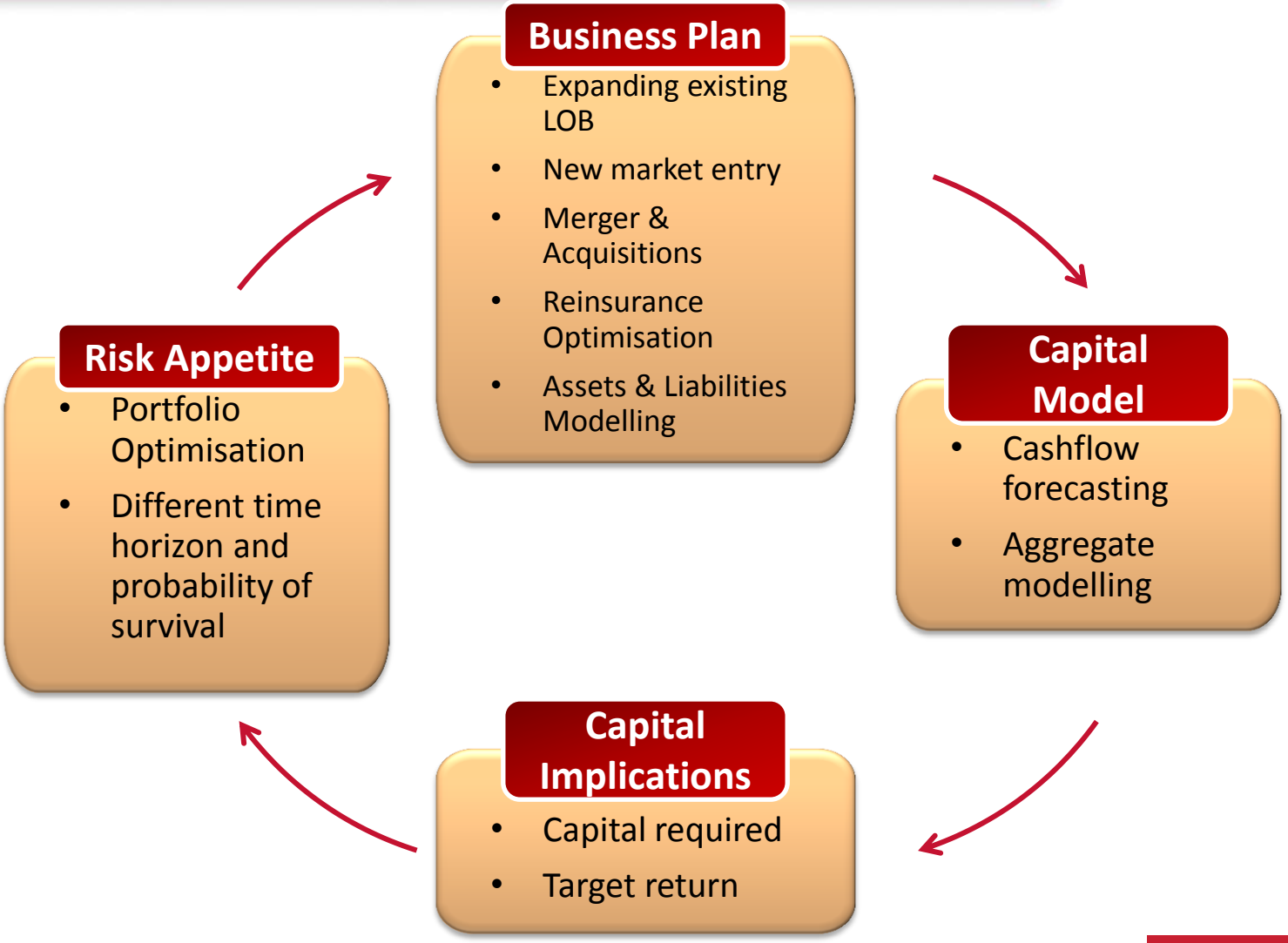
Overview of Capital Modelling process



Integrating your Capital Model – Business Planning



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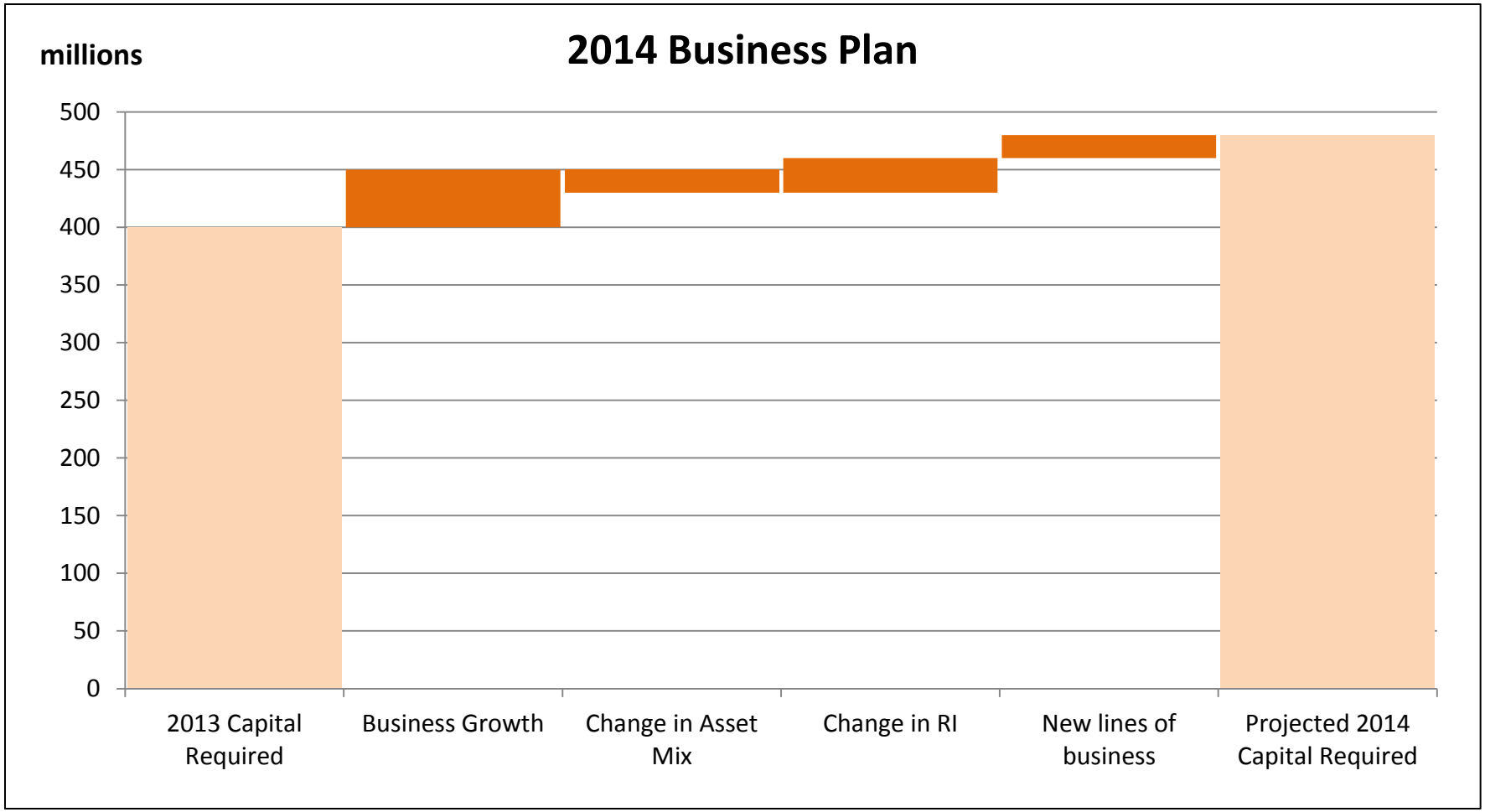
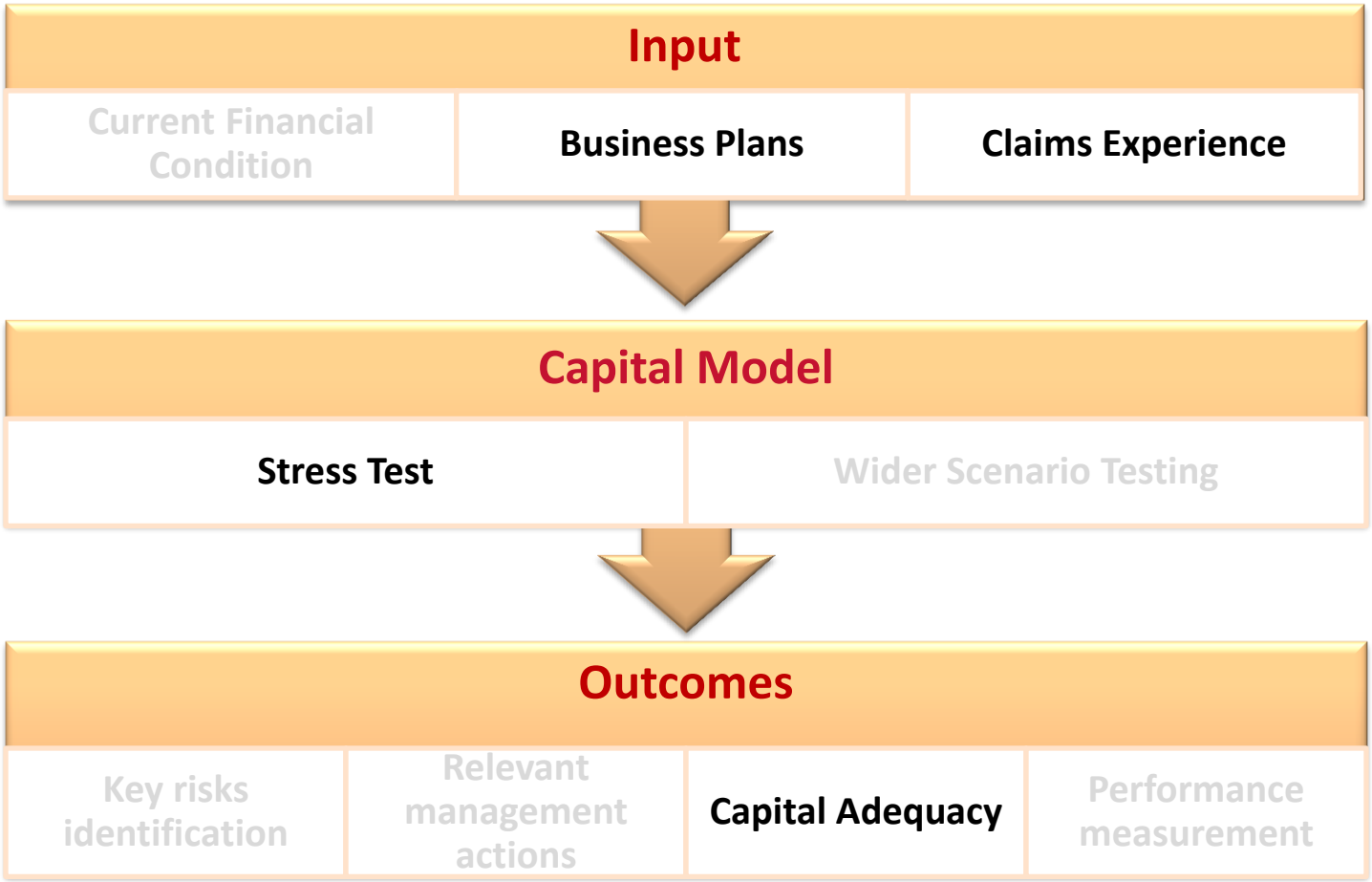


Integrating your Capital Model – Financial Condition Analysis



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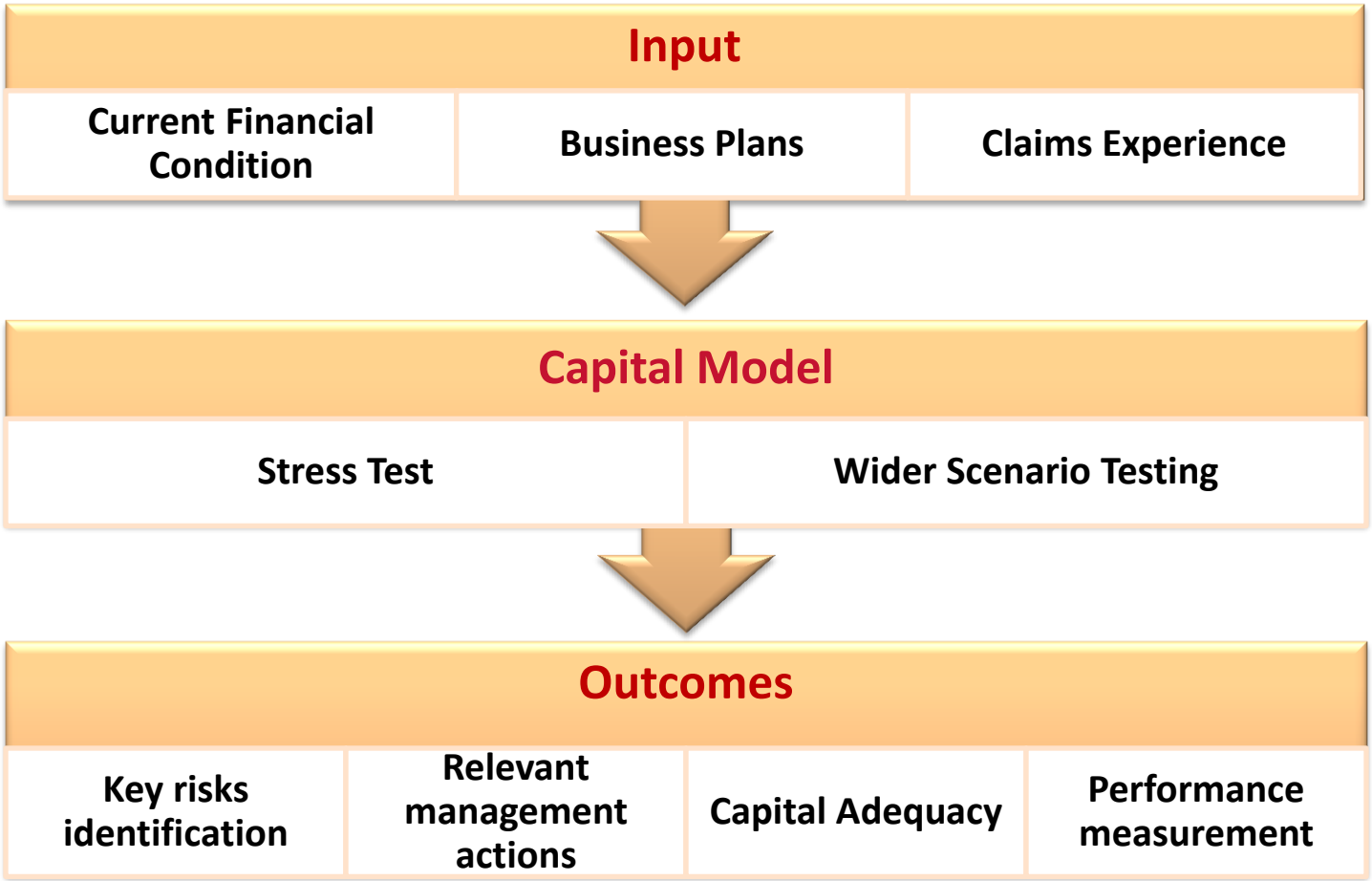

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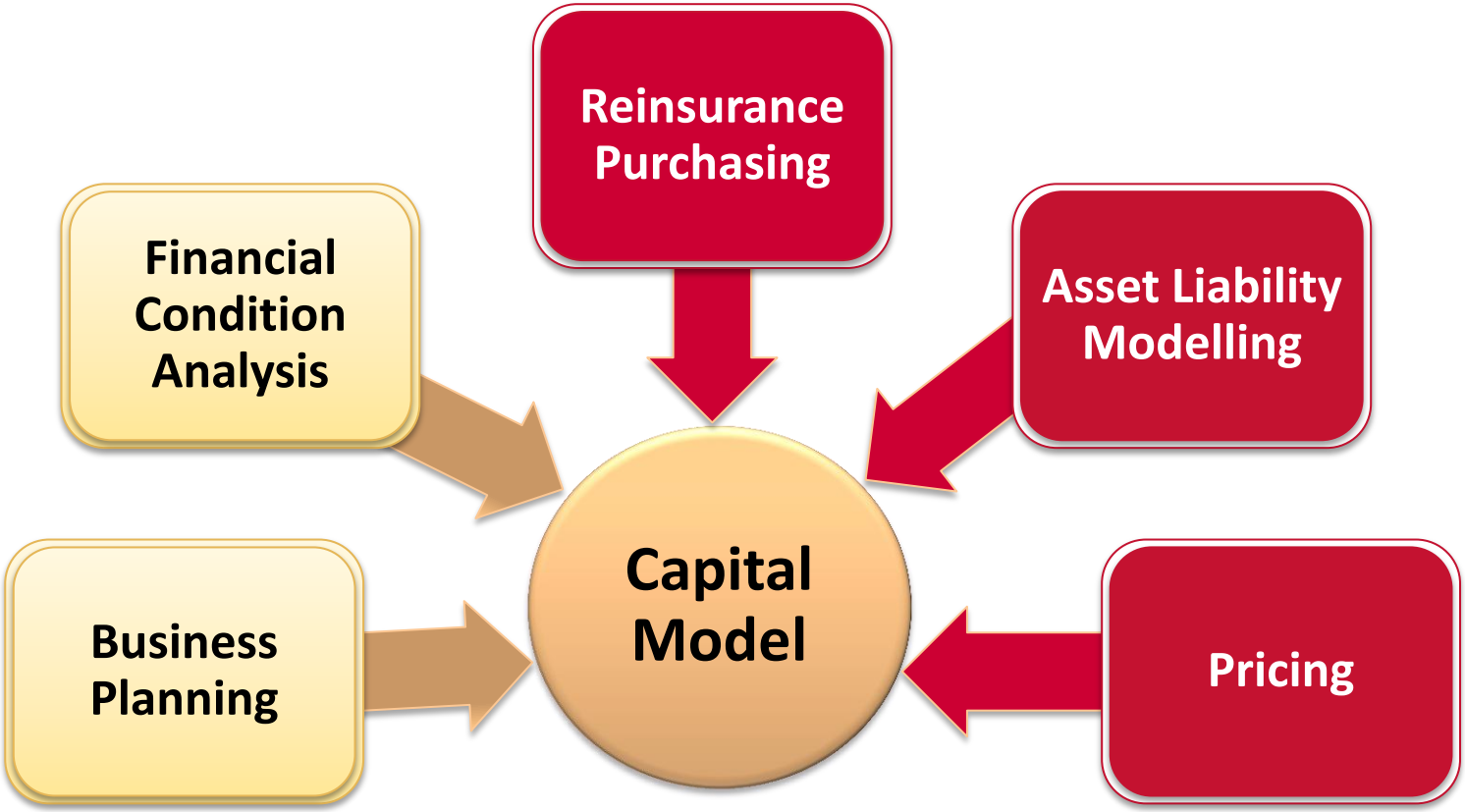
Additional Bolt-ons

Apart from regulatory disclosures…



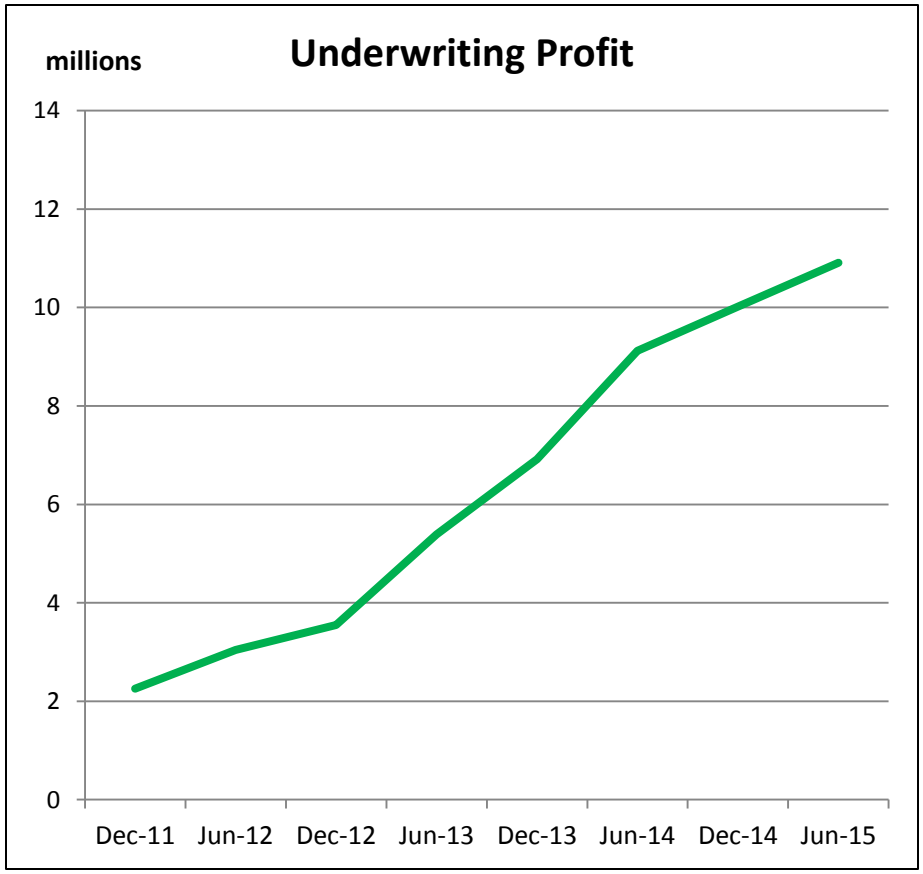
Bolt-ons to your model
Reinsurance Purchasing

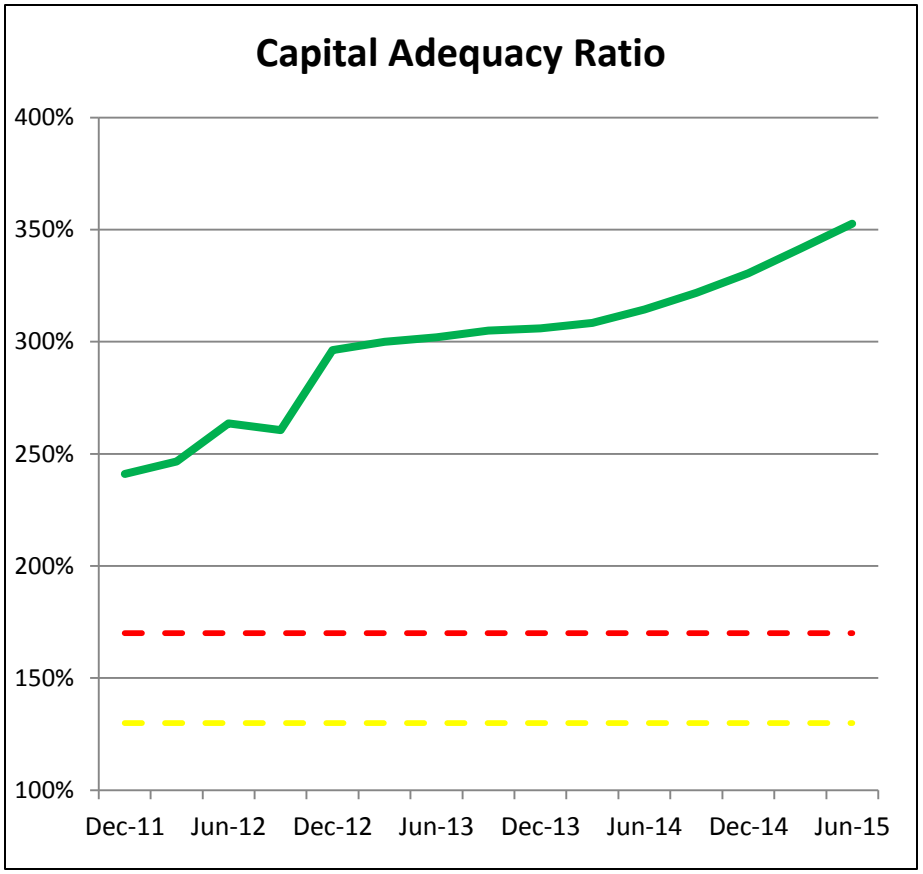
- Current financial position
- Business plan
- Experience data
- Current reinsurance arrangements

- Investigate cost of arrangement
- Investigate the impact from a capital perspective and surplus position

- Tool for discussion with brokers and underwriters
- Optimum retention level
- Optimum structure

Bolt-ons to your model
Reinsurance Purchasing





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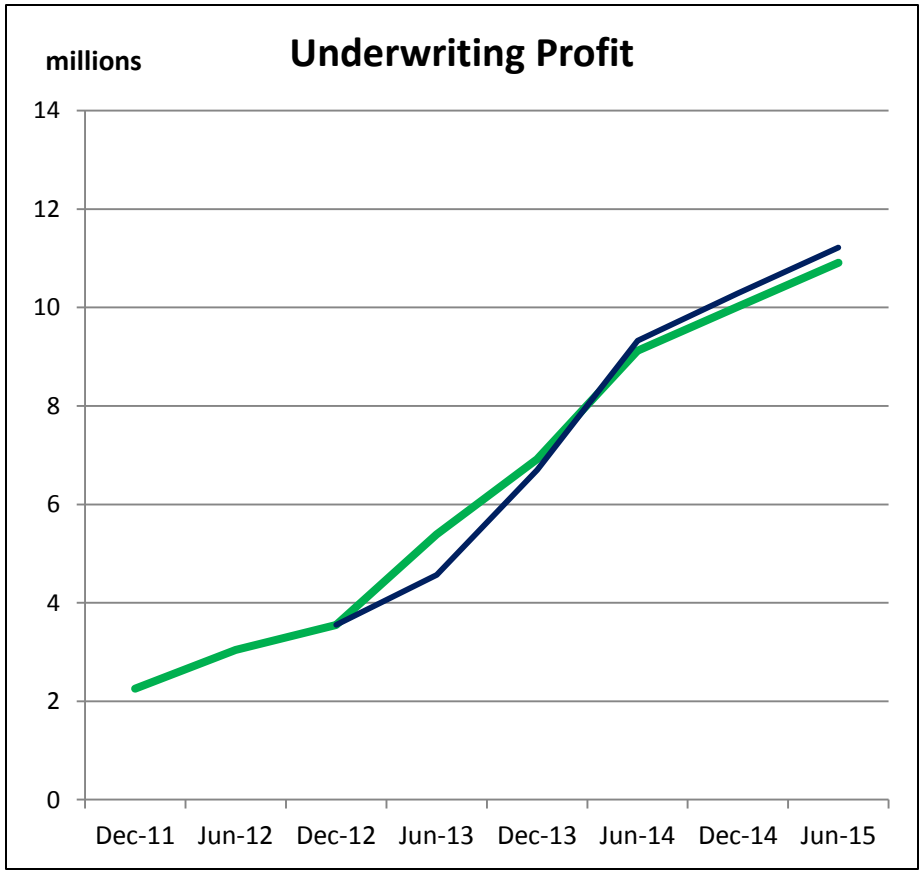

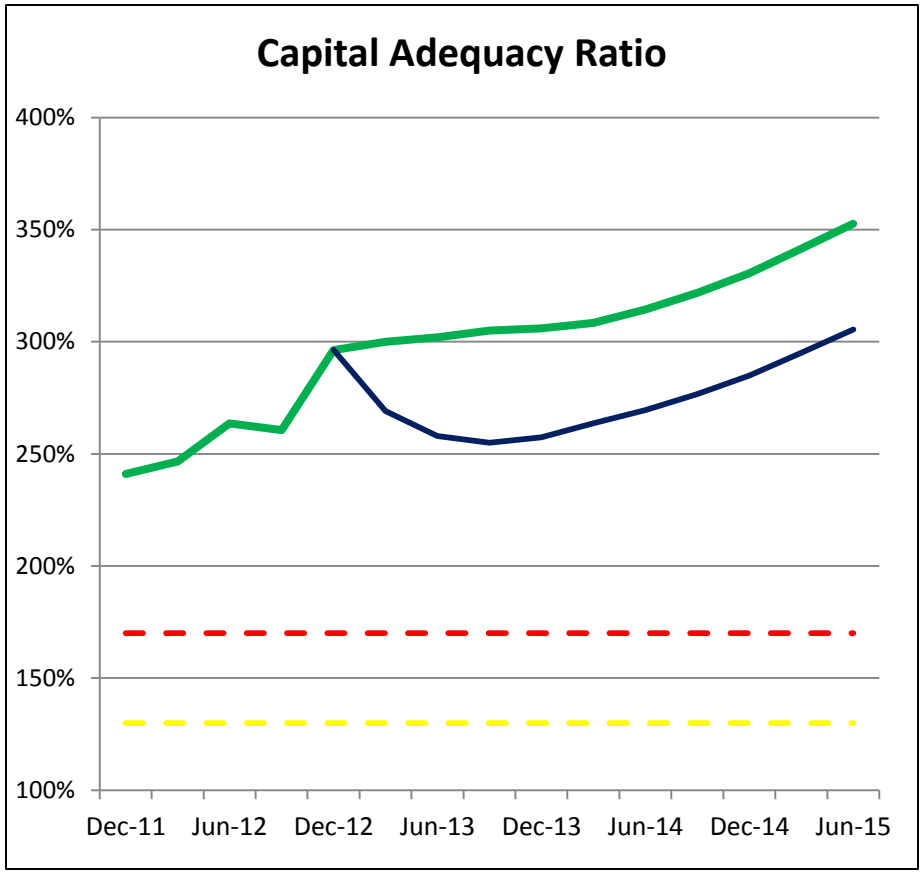

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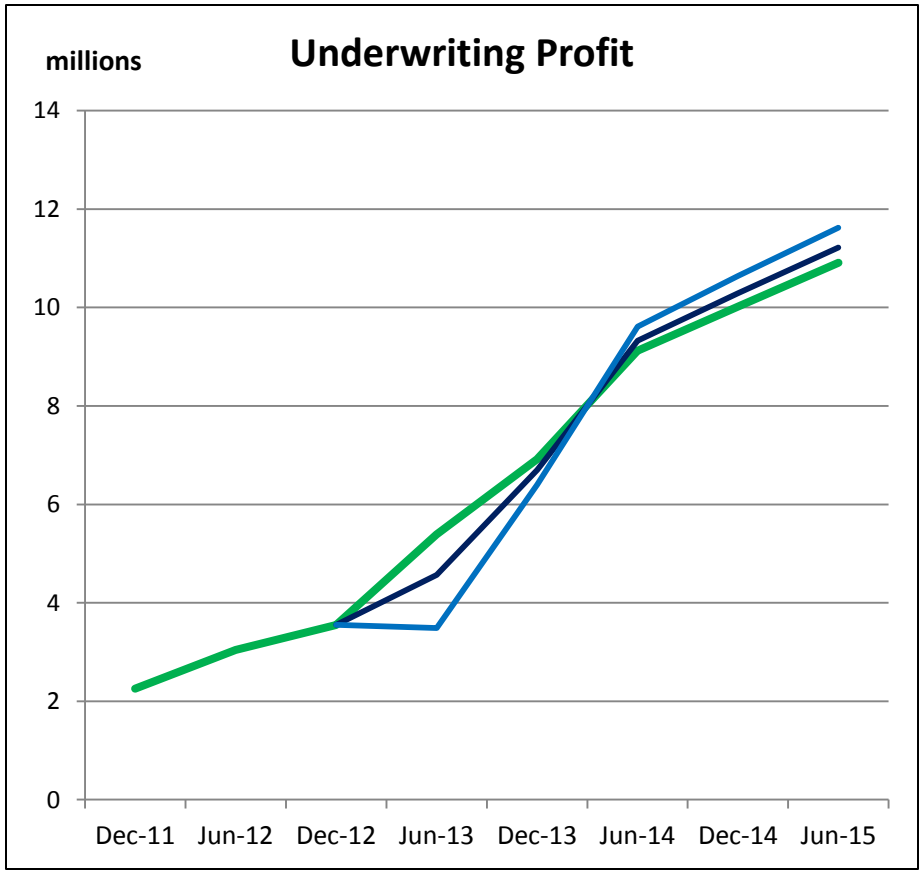
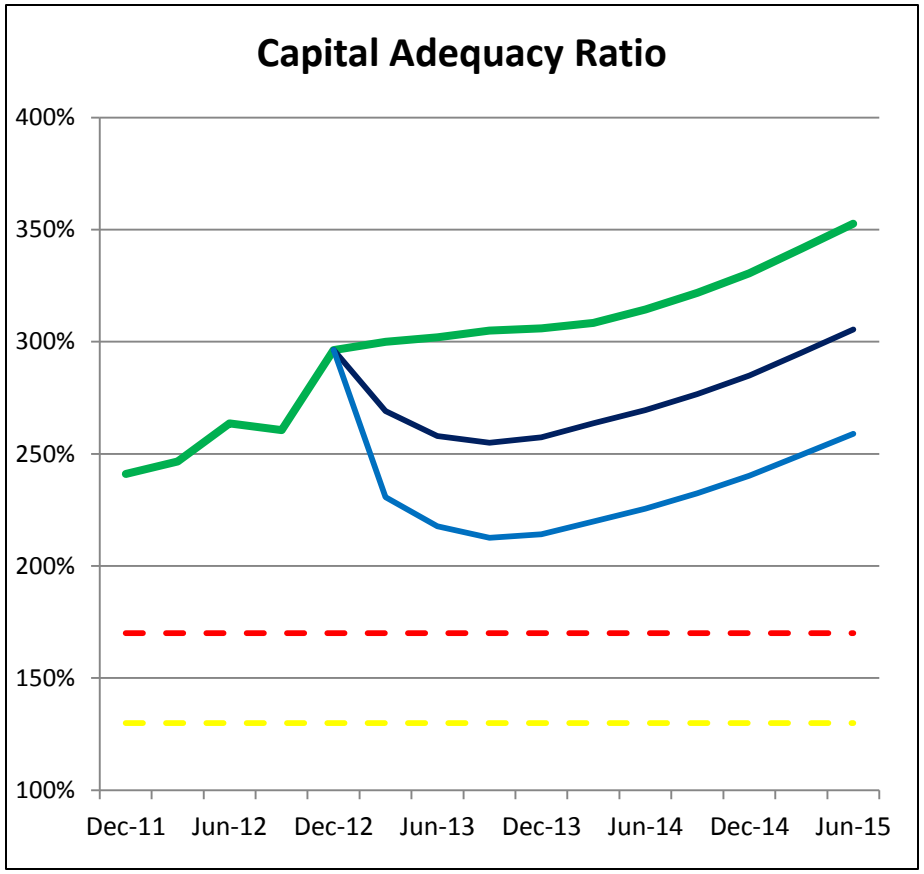
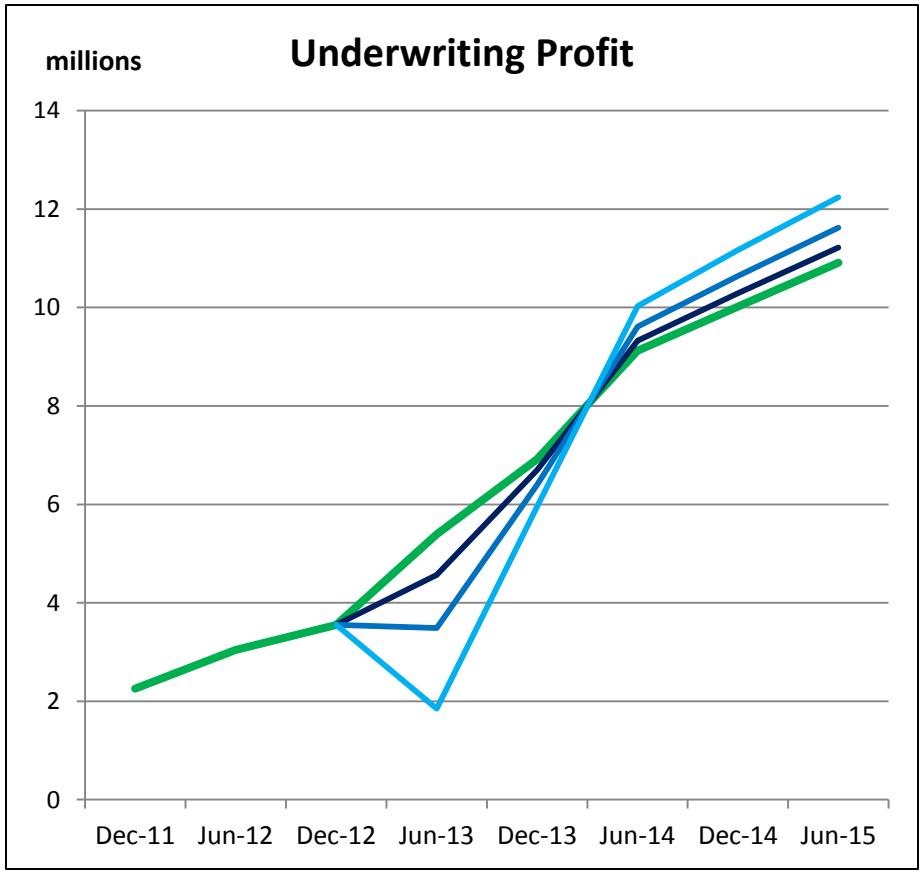
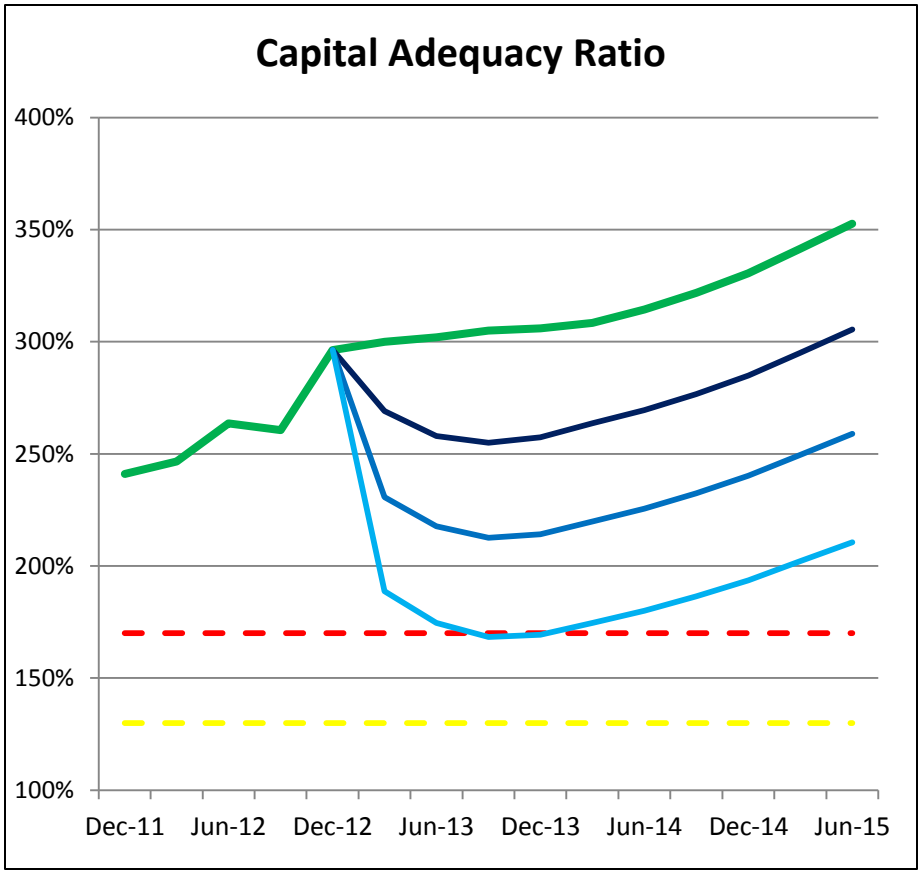




Internal CAR | Statutory CAR | Base - 50%QS | Base - 40%QS | Base - 30%QS

Bolt-ons to your model
Reinsurance Purchasing





Internal CAR | Statutory CAR | Base - 50%QS | Base - 40%QS | Base - 30%QS | Base - 20%QS

Bolt-ons to your model
Asset-Liability Modelling

1

Realignment of investment portfolios

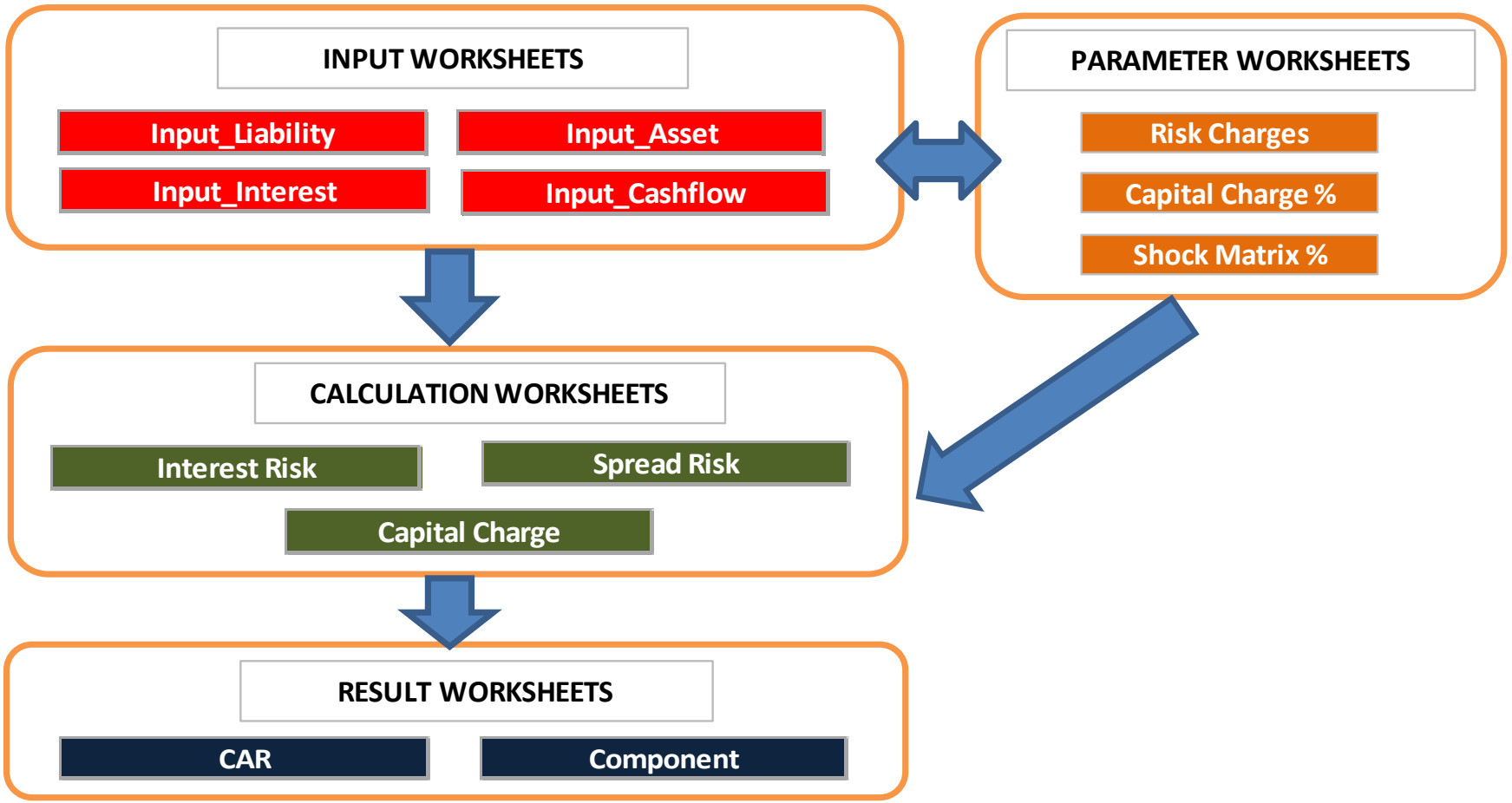
- Understand the effect of various economic scenarios, i.e. fall in equity prices or change in interest rates
- E.g. hold lower equities and higher fixed income instruments
- Derivatives to hedge asset-related risks

2

More active Asset-Liability Management (ALM)

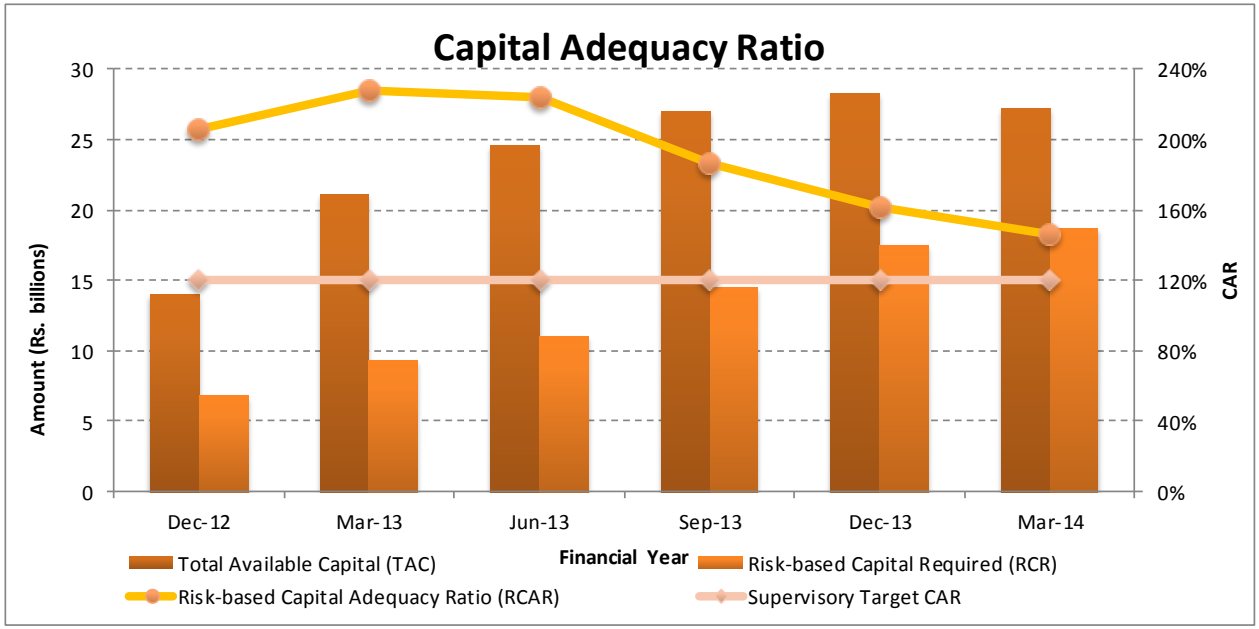
- Use of Economic Scenario Generator (ESG)
- Minimise the duration/currency mismatches
- Punitive market risk charges for mismatches
- Trade off of risk and return of the assets

Workflow of NMG CAR Template



Snapshot of CAR Template Output

	Dec-12	Mar-13	Jun-13	Sep-13	Dec-13	Mar-14
Total Available Capital (TAC)	14.06	21.13	24.64	26.96	28.26	27.23
Tier 1 Capital	14.36	18.16	25.05	21.28	24.89	25.15
Tier 2 Capital	0.52	6.14	1.76	7.86	7.53	6.42
Deductions	0.82	3.17	2.17	2.17	4.17	4.34
Risk-based Capital Required (RCR)	6.84	9.27	11.00	14.44	17.48	18.65
Credit Risk Capital Charge	4.41	4.72	8.62	8.96	11.50	14.85
Market Risk Capital Charge	2.01	4.24	2.22	5.34	5.77	3.60
Insurance Liability Risk Capital Charge	2.35	2.36	1.87	2.02	2.64	2.74
Operational Risk Capital Charge	0.24	0.31	0.33	0.36	0.40	0.39
Risk-based Capital Adequacy Ratio (RCAR)	206%	228%	224%	187%	162%	146%
Supervisory Target CAR	120%	120%	120%	120%	120%	120%



RBC Comparison in Sri Lanka

Scenario	Capital Adequacy Ratio (CAR) under various Scenarios	As at Dec-12	Improvement over Base
	Base scenario	**122%**	
1	Claim Liability deteriorations	118%	-4%
2	Composition in Unit Trust is changed to Corporate Bonds	128%	6%
3	**All Sovereign Bonds have less than 3 months duration**	**171%**	**49%**
4	Alternative investment strategy to match base scenario CAR	122%	0%
5	Shock matrix based on movement in historical interest rate	118%	-4%

Bolt-ons to your model
Pricing

Capital Modelling

- Managing portfolio synergies
- Capital allocation of each LOB
- Set target return on allocated capital

Consistency in methodology, assumptions and data

Pricing

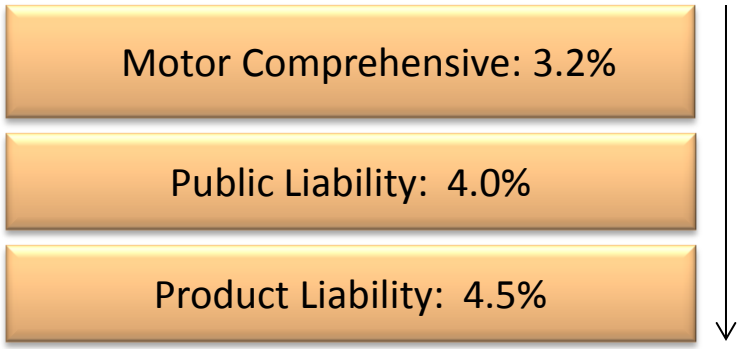
- Determine risk premium
- Measuring value of contract

Optimise expected profit under current market condition

Bolt-ons to your model
Pricing

- **Cost of capital** should be added to the risk price of each insurance contract

- For example, capital loading will be higher for long tailed classes, due to the continued capital cost in subsequent years, arising from:
  - **Reserving** – liabilities might deteriorate
  - **Credit** – reinsurers might go default
  - **Market** – assets that back the technical fund might lose value



Depending on their specific natures, long tailed classes should incur higher capital loading than short tailed classes

Bolt-ons to your model
Pricing

As most firms run their capital models at most quarterly, any **marginal adjustments** may be applied to these loadings during the inter-valuation periods, without the need to re-run the capital model

Trigger Point for Pricing Adjustment	Motor Loadings	Liability Loadings	Reason
5% growth in Motor book	+0.1%	-0.2%	Less/more diversification
5% growth in Liability book	-0.1%	+0.2%	Less/more diversification
10% growth in all business	-0.1%	-0.1%	Non-linearity
1% interest rate rise	+0.2%	+0.5%	Capital more expensive
Economy less stable	+0.1%	+0.3%	Inflation more volatile

Source: Integrating Pricing & Capital Modelling GIRO Working Party

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Solvency II – What has it achieved for insurers?

- **Better risk management**
  - Develop a culture where risks faced are robustly identified and managed
  - Enhanced understanding of sources of risks
  - Improved governance through more informed decision taking
  - Encourage assumptions used in the business to be brought to light and challenged
  - More forward-looking
  - Greater flexibility to review the model as the risk profile of the business changes
- **Greater use of Internal Model**
  - Key strategic decision making (i.e. pricing, reinsurance, investment decisions)
- **Greater transparency**
  - Capital holdings and risk exposure
  - Better insights into their operations for both investors and customers

Solvency II –
What has it achieved for insurers?

"Our company has spent more than £3m implementing Solvency II. Much of the work is now creating benefits including improved information to support business decisions such as reinsurance purchases and business planning."

CRO, Hardy Underwriting
Anthony Williams

Solvency II – What has gone wrong?

- **Too costly, complicated**
  - Risk being ineffective in the future
  - Availability of skilled resources – i.e. actuaries and auditors
  - Higher degree of professionalism needed in setting assumptions for valuation of liability
- **Onerous model approval process**
  - Thousands of pages of documentation as part of the application for approval
- **One-size fits all approach**
  - Doesn't work for EU's 27 member states
- **'Actuarial judgement' is insufficient**
  - Everything must be codified
  - There is little room for flexibility or pragmatism
- **Difficulty in predicting the 99.5th percentile**
  - Very extreme return period
  - Single number having such importance
- **Greater reliance on technical expertise**

Solvency II –
What has gone wrong?

"Imagine if we all drove cars with individually set speed limits based on the suspension and the wheels and the design of the car. Models can never be made that good."

CEO, Hiscox Ltd.
Bronek Masojada

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Challenges around Capital Modelling

- **Resources and time**
- **Communication of the results**
  - To key stakeholders i.e. management, underwriters, brokers etc.
- **Difference in approach**
  - Different level of prudence within assumptions (Pricing vs. Capital Modelling)
  - Different periods
  - Level of granularity required is different
  - Different categories of users
- **Adequate testing of future projections**
  - Back-testing (i.e. comparing the predictions from the model with actual experience)
- **Availability of data**
  - Relevance, reliability and completeness of data
- **On-going maintenance of the model**

Next steps

- **Explore what your model is currently doing**
  - Regulatory requirement?
- **What else can your model do for you**
  - Reinsurance Purchasing
  - Business Planning
  - Pricing
  - Financial Condition Analysis
  - Asset & Liability Modelling
- **To what extent should ERM be mandated?**

Thank you

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