

Capital and Reinsurance Optimization

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Agenda

- Reinsurance as capital
- Capital modelling and reinsurance
- Considerations in structuring reinsurance
- A decision-making framework: risk appetite
- Conclusion

Reinsurance as capital

Reinsurance as source of capital

We will work with a simple example:

- Insurance company with only one line of business
- Uses required regulatory capital for decision-making (assuming economic capital requirements are lesser)
- Only writing business in Singapore, so using the Singapore risk-based capital formula
- How do capital requirements differ under different types of reinsurance, under different scenarios?

Which reinsurance structure is better?

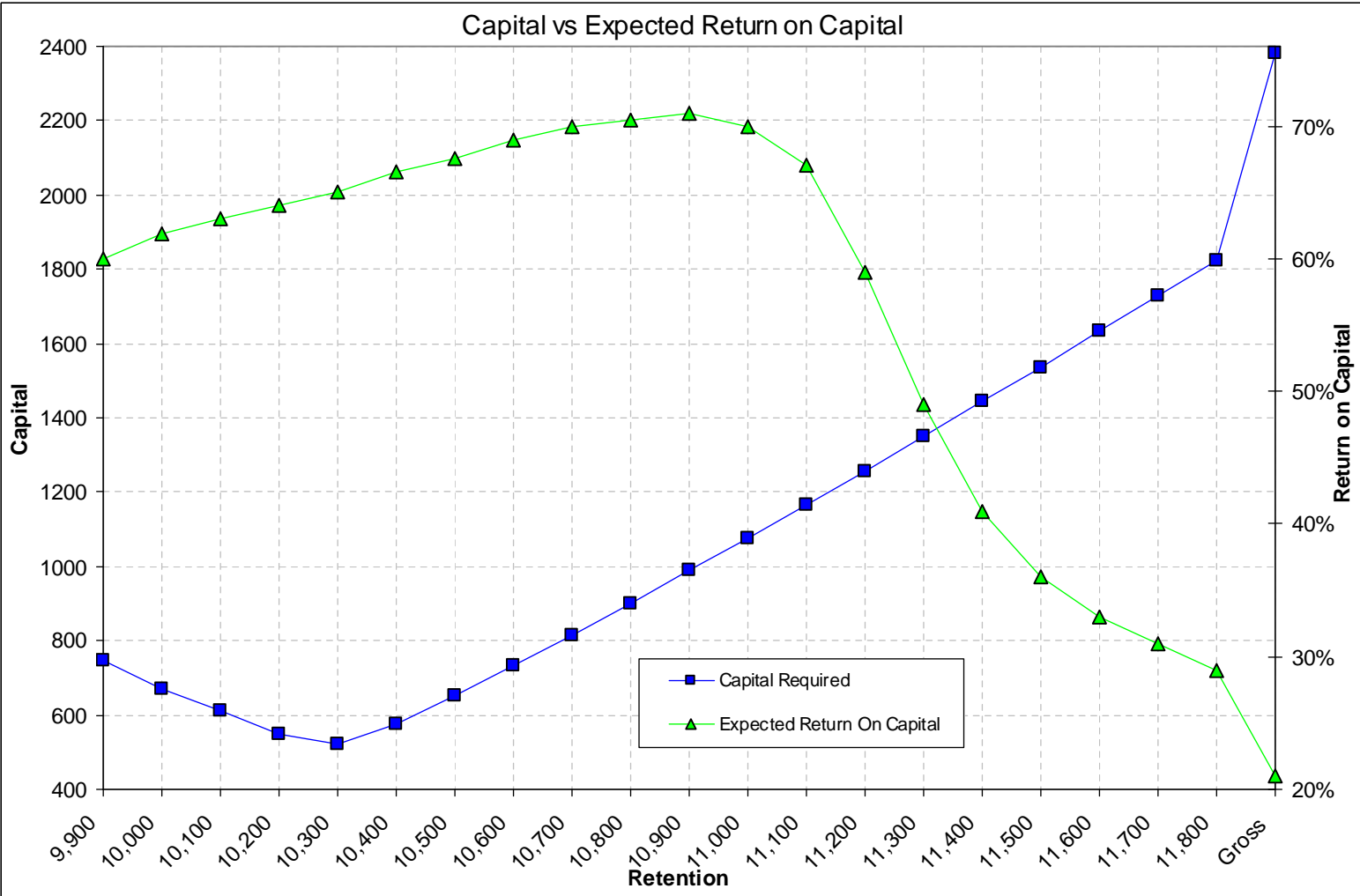
SCENARIO →	No individual claim events above 1M			Two large losses of \$5M each		
1 Year Projection SGD 000s	Gross business	QS - 50%	XOL – xs 1M per loss	Gross business	QS - 50%	XOL – xs 1M per loss
GWP	25,000	25,000	25,000	25,000	25,000	25,000
NWP	25,000	12,500	20,000	25,000	12,500	20,000
Net UPR	7,000	3,500	5,600	7,000	3,500	5,600
Gross Paid	15,000	15,000	15,000	15,000	15,000	15,000
Net Paid	15,000	7,500	15,000	15,000	7,500	15,000
Net Claims Rx	17,000	8,500	17,000	27,000	13,500	19,000
Financial Resource	21,000	30,250	17,850	11,000	25,250	15,850
Risk Charges	7,000	4,350	6,790	9,500	5,600	7,290
CAR	300%	695%	263%	116%	451%	217%

Some considerations:

- XOL seems to provide more stability in earnings
- You may not get coverage for large losses under QS treaty
- Maybe your XOL cover is too expensive (on a risk-adjusted basis)
- What is the likelihood of two losses above \$1M each in a year? Is that acceptable?

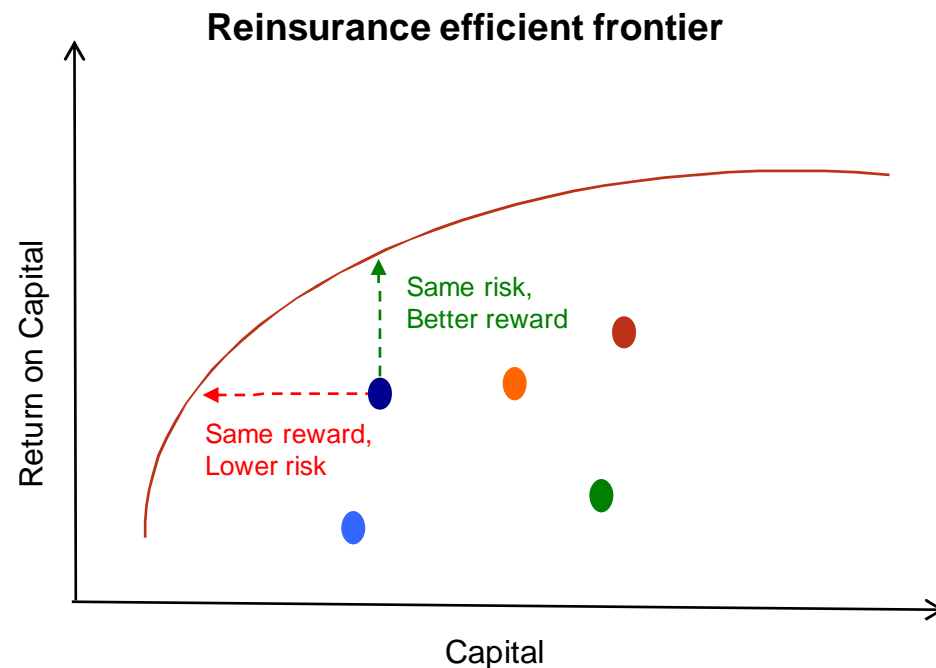
Capital modelling and reinsurance

Different reinsurance designs can be tested against selected risk and reward measures



An efficient frontier gives the optimal design for any given level of risk transfer

- A number of risk and performance measure can be used
- Optimal design to one measure, may not be optimal in another
- Sometime optimal designs may not be usable because of constraints in reality...
- Internal constraints
 - Hurdle rate
 - Available capital
 - Acceptable level of risk
- External constraints
 - Relationship with brokers / reinsurers
 - Capacity in the market
 - Premium rating movements
- Model constraints?



Reinsurance in capital modelling: assumptions

- Good models are simplifications to reflect reality
- Capturing the dynamics of the business is essential when building a model
- Small change in assumption could radically change the conclusion of cost / benefit of a particular reinsurance structure
- Choice of Cat models can change the perspective of the benefits of catastrophe reinsurance
- Models are not the master, but the slave to aid business decisions
- Assumptions used should be open to view and scrutinised in advance, providing transparency and comfort to different stakeholders

Reinsurance in capital modelling: lack of data

- Actuaries rely on the Law of Large Numbers for many of the actuarial methods
- However, there is rarely adequate data of appropriate quality when dealing with extreme events
- Actuaries should make use of other sources of information:
 - external catastrophe models
 - expert advice
 - market view
- Actuaries also need to understand the underlying dynamics of the business, and the limitations of different set of data before selecting the appropriate set of data and approach to modeling

Considerations in structuring reinsurance

Structuring Reinsurance is a balancing act ...

Rating Agency / Regulatory Needs	Excess Capital	Non-traditional solutions	Share higher risk business with reinsurers	Eliminate transaction costs
Pressure from competition	More risks with higher sum insured	Retain More Profit	Peak volatile risk exposure	Less stable/liquid assets
Grow net retained premium	Relationship with brokers	Prediction of worsening claim characteristics	Increase diversification	Hard RI market
Reserve Volatility	Support growth story (capacity requirement)	Alternative Risk Transfer Solutions	Accumulation of exposures	Expert advice on new products

■ Buy more reinsurance

■ Buy less reinsurance

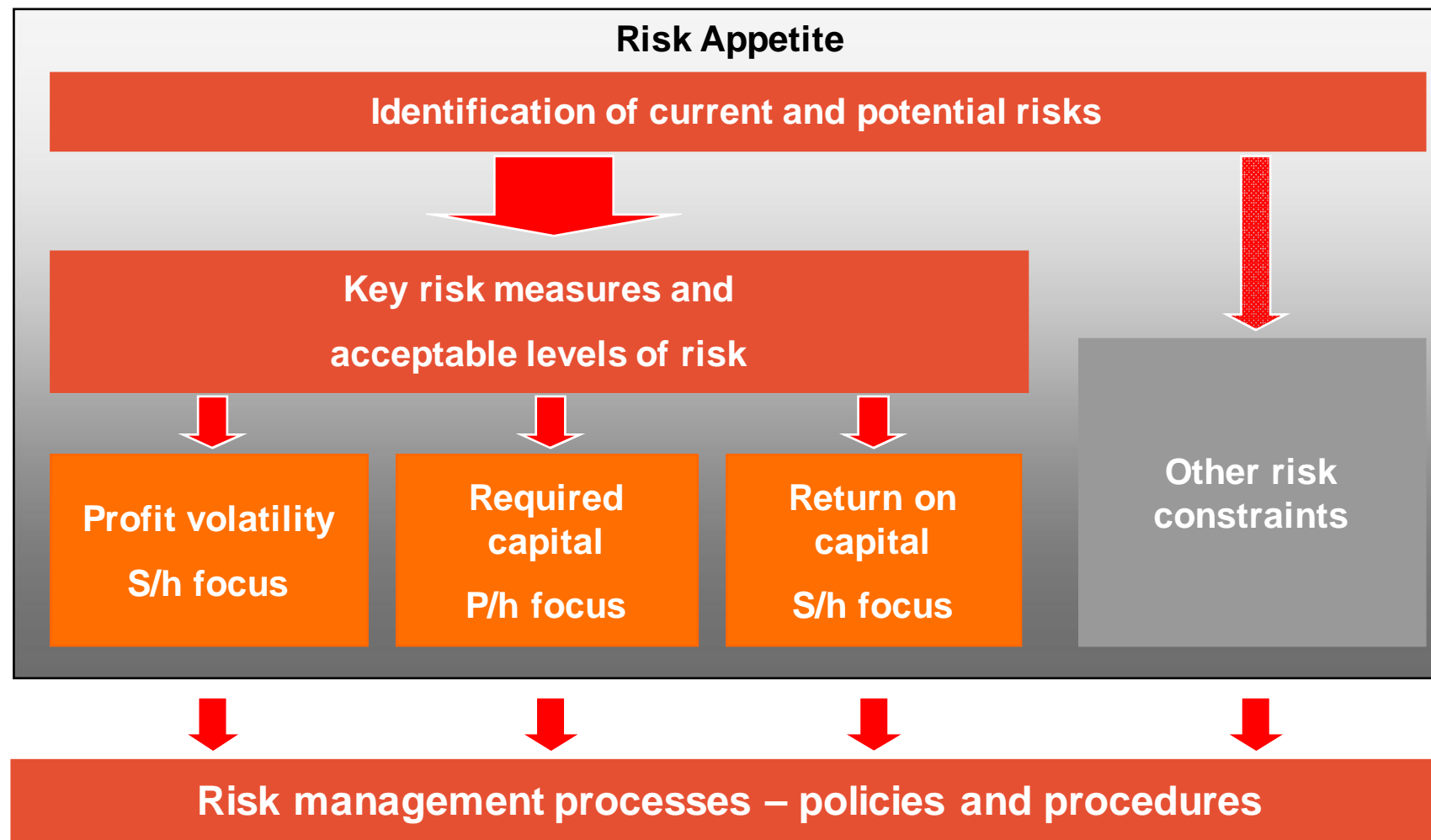
Optimisation must be specific to company because each company has different ...

- Volume and mix of business
- Profitability history and outlook
- Exposure to large claims and natural / man-made catastrophes
- Investment strategy
- Reinsurance availability
- Capital amount and structure
- Reserve adequacy
- Corporate structure
- Stakeholders' expectations
- Rating agency and regulatory considerations



A decision-making framework: risk appetite

The risk appetite provides a framework for managing risk in the business



Case-study: setting reinsurance retentions

Risk appetite can form the basis for optimizing reinsurance program settings

- The elements that make up an insurance risk appetite might include:
 - Nature and extent of the risk exposures to be taken on and retained, for example:
 - Exposure to normal statistical fluctuations in claim costs
 - Large single exposures on individual risks
 - Exposure to risk concentrations
 - Exposure to systemic catastrophic events
 - Limits on profit volatility from insurance claim costs
 - Desired probability of sufficiency in relation to insurance claims (which in turn will define the level of capital to be held against insurance risk)
 - Required return on capital

Case-study: setting reinsurance retentions (cont.)

Insurance risk appetite therefore defines the relevant metrics (and associated tolerances) for assessing insurance risk

- The process of setting reinsurance retentions can involve the following steps:
 - Analyse gross insurance risk exposures (using the defined metrics)
 - Develop “theoretical” reinsurance strategy to align exposures with appetite, considering:
 - types of reinsurance coverages
 - retention limits
 - value of ancillary services
 - Develop “actual” strategy bearing in mind existing reinsurance structure and prices

Risk appetite will influence:

- how the reinsurance program is protecting against different risk exposures
- the use of XOL covers to adjust the overall exposure to insurance risk
- the use of proportional covers to help optimise the risk profile

Conclusion

Conclusion – reinsurance optimisation

- With regulators and rating agencies imposing stricter monitoring and controls on capital requirements, reinsurance is becoming increasingly important as a source of capital
- Reinsurance is a huge spend; it should be analysed critically and actuaries are in a good position to facilitate the analysis
- Ideally reinsurance purchase should be linked with a company's risk appetite

“Chance favors the prepared mind.”
-- Louis Pasteur



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