Reinsurance Counterparty Risk
What Gets Measured Gets Managed

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Agenda

Building blocks of RCR exposure management

Understanding the nature of RCR

Modelling and Measuring RCR

Establishing Limits / Managing RCR

Building blocks of RCR puzzle …

> **"… *what gets measured gets managed* "**

Understand the nature of RCR	Model and measure RCR	Manage RCR

Risk of the reinsurance counterparty failing to pay reinsurance recoveries to the ceding insurer in a timely manner, or even not paying them at all.

It emerges mainly because the ceding insurer pays insurance claims to policyholders before reclaiming reinsurer's part.

Reinsurance Credit Risk (RCR)

RCR Exposure

RCR Exposure Limit

Exposure to RCR is often communicated through a mixture of the following **communication proxies**:

Past Exposure determined by :
- Reinsurer's share of technical provisions

Future Exposure determined by:
- The aggregate policy limit; or
- The amount of ceded premium

RCR Exposure Limit is the amount of *maximum admissible exposure* to RCR *per counterparty* and/or *cohort of counterparties* that allows on-going operations to remain within the risk appetite:

- Calculated with reference to RCR capital attributable to overall capital requirements, expressed as a percentage of communication proxy of RCR exposure

- Must be set at a Group level and at individual entity level

- Counterparty can only be utilised if limits are not exceeded

The nature of RCR

RCR is the risk of the reinsurance counterparty failing to pay reinsurance recoveries in full to the ceding insurer in a timely manner – *unwillingness* to pay, or even not paying them at all – *inability* to pay.

- Usually is a small attributor to SCR, but could be sizeable in the case of fronting.

- **To some extent is similar to Investment Credit Risk** – in both cases the loss can be decomposed into: default *frequency–severity–recoveries*.

- **However, there are fundamental differences** between them that arise in relation to default frequency, severity (exposure), and recoveries.

  - *Different default events:* under financial distress reinsurers often go into run-off and enter into a commutation agreement with ceding insurers compared to bond issuers that default as a result of shortfall in interest and/or principal payments.

  - *Higher risk concentration:* compared to bond issuers, the number of reinsurers is small, and therefore more concentrated exposure.

  - *Higher risk correlation:* RCR exposure is specific to one industry sector (insurance), and therefore correlations are higher than in a diversified bond portfolio.

Modelling and measuring RCR – modelling paradigms

Paradigm 1: Calibration to observed prices *(investment banking approach)*

- <u>Shortcoming 1</u>: It relates to model mis-specification, and how that impacts model derived estimates. If a model is mis-specified, the resulting default rate estimates will be biased.

- <u>Shortcoming 2</u>: When calibrating to CDS prices, the prices reflect all the dynamics of CDS market most of which are not relevant for the purpose of modelling reinsurance credit default.

Paradigm 2: Calibration to observed parameters

- Refers to maximum likelihood estimators based on direct observation of data.

- Usually direct observations (<u>AM Best asset impairment rates for reinsurers</u>) are used to estimate unconditional reinsurance default rates.

Paradigm 3: Calibration to 'emergent properties' or 'stylized facts'

- We have, from observations, some views on how model outputs should behave. The model is then calibrated so that the desired properties are recovered.
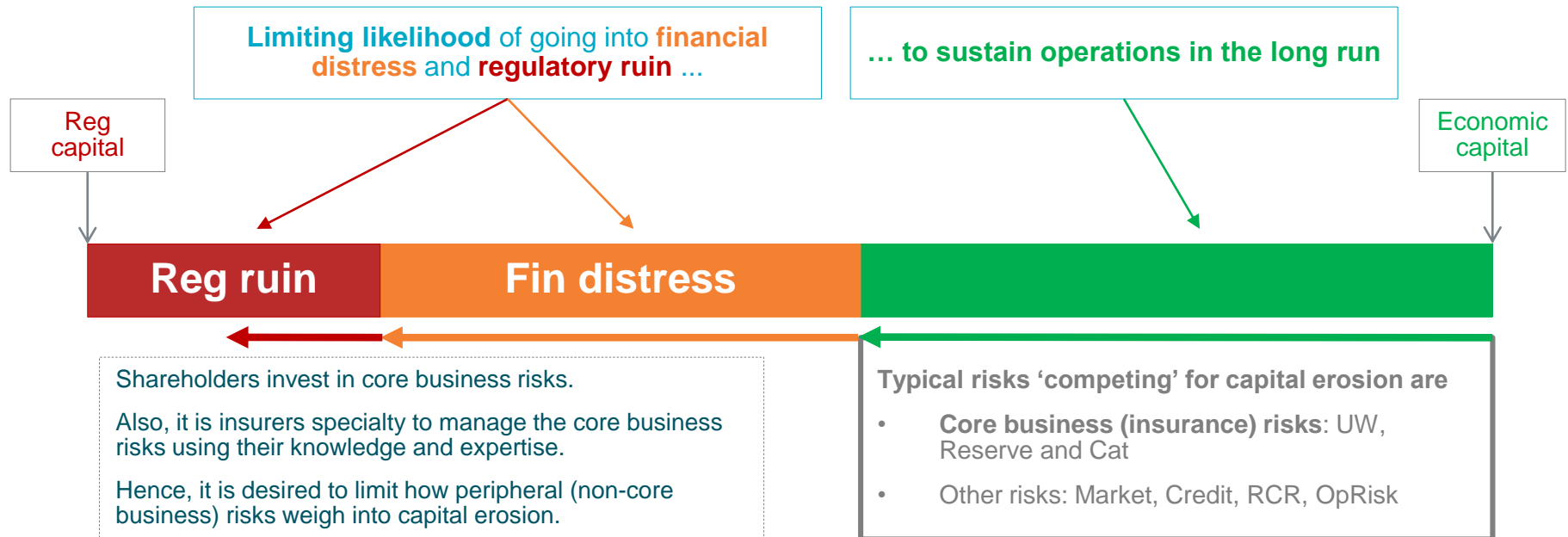
RCR models – industry examples

	ter Berg model (2008-2009)	DFA model (Britt–Krvavych, 2008)
Model type	Stochastic / use of paradigms 2 and 3	Stochastic / use of paradigms 2 and 3
Modelling approach	Common shock: • PD shock size is Beta distributed • Common shock is used to introduce dependence between RI counterparties • LGD can be randomised	Common shock: • PD shock size is Bernoulli (binary) variable • Common shock is used to introduce dependence between RI counterparties • LGD can be randomised
Calibration	AM Best (unconditional) impairment rates for reinsurers are used to calibrate conditional 'normal' and 'stressed' PDs	AM Best (unconditional) impairment rates for reinsurers are used to calibrate conditional 'normal' and 'stressed' PDs Imposes Gaussian dependence structure which is calibrated to empirical asset return
Implementation	Internal model	Internal model / active management is assumed to manage credit migration
Application	SII referenced model	Australia (LAGIC)
References	Arne Sandström, *Handbook of Solvency for Actuaries and Risk Managers,* CRC Press, 2011	International Actuarial Association (ASTIN)

Why managing exposure to RCR?

… because the ceding entity management [the Board] have preferences as to how quickly capital may be eroded and by what types of risk

… these risk preferences are formalised in Risk Appetite (RA)

Link to Risk Appetite

Limiting likelihood of going into **financial distress** and **regulatory ruin** …

… to sustain operations in the long run

Reg capital

Economic capital

Reg ruin	Fin distress	

Shareholders invest in core business risks.

Also, it is insurers specialty to manage the core business risks using their knowledge and expertise.

Hence, it is desired to limit how peripheral (non-core business) risks weigh into capital erosion.

Typical risks 'competing' for capital erosion are

- **Core business (insurance) risks**: UW, Reserve and Cat

- Other risks: Market, Credit, RCR, OpRisk

… therefore, risk composition matters and is part of the Risk Appetite statement !

Risk Appetite in action …

Example of high-level RA

Pre-specified likelihood of triggering various lower multiples of regulatory capital requirements

- E.g., available capital falls below 110% of regulatory capital requirements no more frequently than 1-in-15 yrs.

Risk composition

- E.g., RCR attribution to the regulatory capital requirements is required to be no greater than X% (limit).

- A system of early warnings would be imposed to effectively manage the exposure to RCR:

  - Normal operational range: RCR attribution is between Y% and Z%

  - Amber warning: lower threshold

  - Red warning: upper threshold

Risk Appetite in action … [cont'd]

Example of granular RA

Imposing limits of RCR concentration per credit rating bucket and per single counterparty

Rating	Rating bucket exposure share limit	Minimum number of counterparties	Maximum exposure share per counterparty	LoB Type
AAA	≥ 5%	3	60%	L/M/S
AA+	≥ 20%	3	60%	L/M/S
AA	≥ 25%	4	50%	L/M/S
AA-	≥ 18%	4	50%	L/M/S
A+	≤ 10%	5	40%	M/S
A	≤ 8%	6	35%	M/S
A-	≤ 6%	6	30%	M/S
BBB+	≤ 4%	8	20%	S

Class	Capital ($ m)	Size adjustment factor
I - VII	Less than 100	0.3
VIII	100 to 250	0.5
IX	250 to 500	0.6
X	500 to 750	0.75
XI	750 to 1,000	0.8
XII	1,000 to 1,250	0.85
XIII	1,250 to 1,500	0.9
XIV-XV	1,500 or greater	1.0

Attributes of granular Risk Appetite

- Admissible credit quality of RI counterparties is limited from below, say BBB+ and above

- Each type of exposure proxy is split between credit rating buckets (8 buckets) and between counterparties within each bucket

  - Assigned exposure share increases with the credit quality of bucket / counterparty

  - The minimum number of counterparties sharing admissible exposure assigned to a credit rating bucket increases as the credit quality reduces

  - Lower credit quality buckets would generally be restricted to LoBs with shorter liability duration.

- It is recommended that exposure limit for single counterparty is further differentiated by the size of counterparty

THANK YOU!

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