Seminar on Reinsurance

June 8–9, 2021 • Virtual Event

Risk Transfer Testing

Overview, Basics and Application

Bill Miller, FCAS, MAAA
Managing Director
KPMG Advisory Bermuda

Agenda

- Reinsurance Accounting Risk Transfer Requirements
- Reviewing Contract Risk Transfer
  - Exempt, Self-Evident, or Not Self-Evident
  - Roles and Responsibilities
- Risk Transfer Analysis Example
- Conclusion

Risk Transfer Resource Material

- Accounting Standards
  - US Statutory - SSAP 62R
  - GAAP - FAS 113

- Actuarial References:
  - AAA COPFLR; "Reinsurance Attestation Supplement 20-1: Risk Transfer Practice Note"; January 2007
  - Friehaut & Vendetti; "Common Pitfalls and Practical Considerations in Risk Transfer Analysis"; CAS E-Forum Spring 2009

Reinsurance Attestation

CEO and CFO shall attest, under penalties of perjury, with respect to all reinsurance contracts for which the reporting entity is taking credit on its current financial statement, that to the best of their knowledge and belief after diligent inquiry:

1. There are no separate written or oral agreements
2. When risk transfer is not reasonably considered to be self-evident, documentation concerning the economic intent of the transaction and the risk transfer analysis evidencing the proper accounting treatment is available for review
3. Reporting entity complies with SSAP 62R
4. Controls are in place to monitor adherence to SSAP 62R

Essential Ingredient : Transfer of Risk

Reinsurance requires both of the following:

a) Reinsurer assumes significant insurance risk
b) Reasonably possible that the reinsurer may realize a significant loss

FAS 113
Paragraph 9

SSAP 62R
Paragraph 13

A reinsurer shall not be considered to have assumed significant insurance risk under the reinsured contracts if the probability of a significant variation in either the amount or timing of payments by the reinsurer is remote.

Accounting: Reinsurance vs Deposit

Reinsurance Accounting	Reinsurance Accounting
Credit in the accounting statements for ceded premium and ceded losses and ceded reserves	The net consideration paid does not reduce premium, but creates deposit asset with deposit accounting
Impacts income statement and tax treatment	No reduction in loss reserves
Ceding company can recognize benefit of contracts to underwriting gain and capital levels	As contract experience develops, reserves and payments flow, changes are recorded as “other income or loss”

Risk Transfer - Contract Types

Contracts defined as “exempt”, must have:

- If substantially all of the insurance risk relating to the reinsured portions of the underlying insurance contracts has been assumed by the reinsurer

Contracts defined as “reasonably self-evident”, must have:

- A potential loss to the reinsurer that is much larger than the premium for the coverage provided
- Terms and conditions of coverage that are standardized for the classification or type of contract
- An absence of provisions that enable the reinsurer to recover all or a significant portion of the covered loss

Contracts considered “not reasonably self-evident” include:

- Premium is close to the present value of the coverages provided
- Contract is manuscripted using terms of coverage that are not standard for contracts within the classification or type of contract
- Includes provisions that enable the reinsurer to recover all or a significant portion of the covered losses

AAA Practice Note: Reasonably Self Evident

- Straight Quota Share
  - No risk-limiting features other than a loss ratio cap with negligible effect on the economics of the transaction
  - Fixed commission terms
- Single Year Property Catastrophe
  - Little or no risk limiting features apart from a reinstatement premium common to these types of contracts
- Treaty Per Risk Excess of Loss
  - Arrangements with rates on line well below the present value of the limit of coverage, or without aggregate limits, sub-limits, or contingent features

AAA Practice Note: NOT Reasonable Self Evident

- Quota Share Contracts with Risk Limiting Features
  - Loss ratio corridors, sliding scale commissions, loss ratio caps and/or sub-limits that significantly impact the amount of risk being transferred.
- Aggregate Excess of Loss Contracts
  - Aggregates contracts in general are scrutinized
  - These contracts can either contain significant risk-limiting features, and/or attach in an expected layer of loss so that the premium approaches the present value of the coverage provided.
- Contracts with Experience Provisions
  - Experience accounts, experience rating refunds, or similar provisions if such provisions have a significant impact on the contract's economics.
- Multiple Year Contracts
  - Many of these have provisions that protect the reinsurer from changes in exposure over the contract period and make the analysis complicated, and/or have features that adjust the terms of later years explicitly or implicitly based on results in earlier years;

Risk Transfer Determination

Risk transfer is principles based standard:

Reasonably possible that the reinsurer may realize a significant loss

Risk transfer analysis quantification :

Probability and Size of Loss (10/10 Rule)
Expected Reinsurer Deficit

Risk Transfer Analysis Roles and Responsibilities

Who will commonly do the risk transfer analysis work?

- Ceding company actuary
- Reinsurance intermediary actuary
- Auditor / consulting actuary
- Reinsurer company actuary

Actuarial Work Product Scope

- Purpose is to demonstrate and quantify distribution of treaty results for determination of a contract's risk transfer characteristics
- Actuarial judgement in construction of appropriate model and assumptions
- Documentation standards of modeling assumptions and considerations

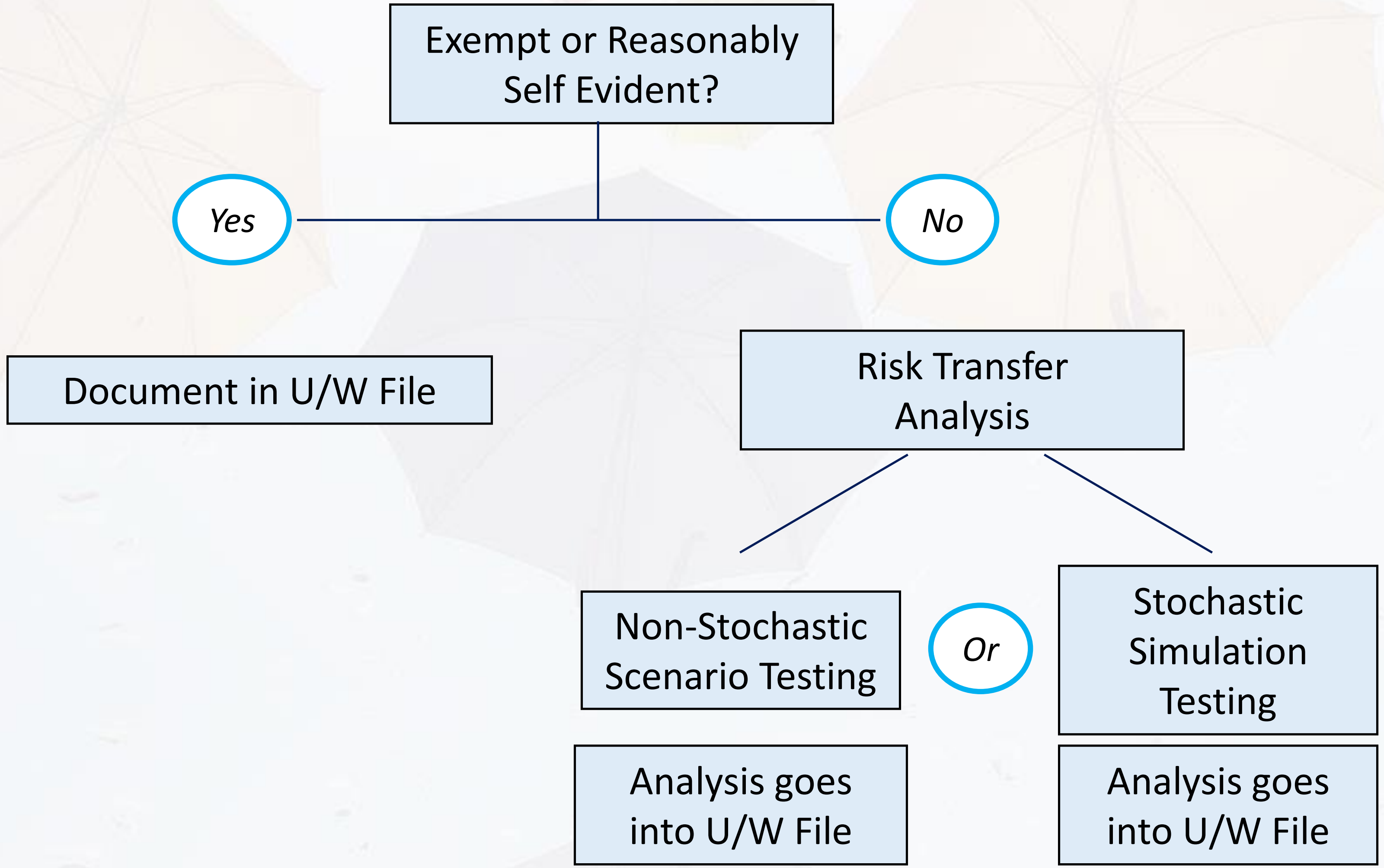
Who is ultimately responsible for risk transfer analysis and determination?

- Company management takes ownership of any external or internal analysis if used in making risk transfer determination
- Management decides upon sufficient risk transfer and reinsurance or deposit accounting treatment, and accounting auditors will need to concur
- Ultimate responsibility cannot be delegated to outside entity

Interactive Poll – Your role in with regards to risk transfer analysis?

A. Student, just learning about risk transfer
B. Would be doing analysis from ceding company perspective
C. Would be doing analysis from assuming company or treaty pricing perspective
D. Consumer of risk transfer analyses to assist with risk transfer reviews

Risk Transfer Process Flow Tree



Risk Transfer Analysis Review Practice Note Outline

- Read and understand the substance of the contract
- Develop appropriate loss model for subject losses and cash flows
- Overlay all significant contract provisions impacting risk transfer
- Discounted cash flow basis (NPV @ fixed discount rate)
- Summarize distribution of results, key ratio :

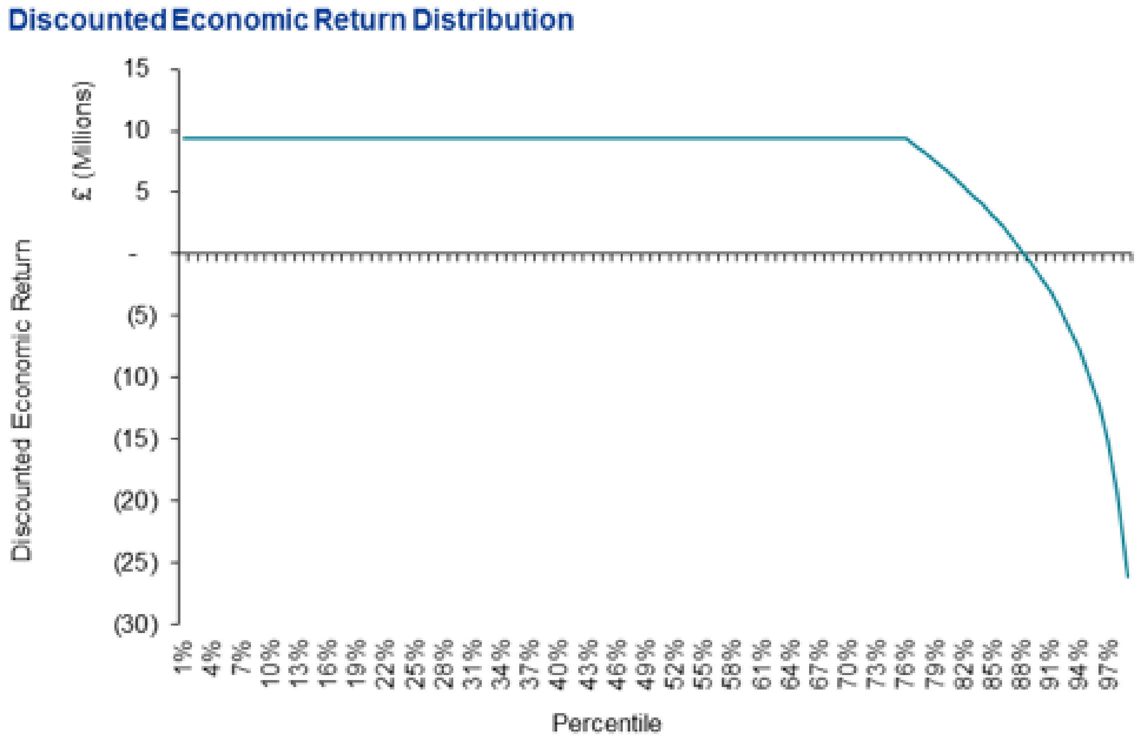
$$\frac{\text{NPV Reinsurer Net Result}}{\text{NPV Total Premium}}$$

- Quantification and summary of cash flows & risk metrics
- Documentation and communication to decision maker

Case Study: QS w Sliding Scale Commission

- Summary of Contract
- Retrocessionaire ABC enters into a 32.5% renewal share of a 100.0% Auto Liability quota share
- Reinsurer XYZ has an 80% quota share participation in all insurance policies issued by Insurer LMN
- Of this 80%, the first $25k of each loss is retained by XYZ
- Expected Net Premium = $82.6m
- Expected Loss Ratio = 78%
- Sliding Scale Commission: The provisional commission is 16%. This is adjusted on a linear scale from a maximum of 26% at a LR of 70% to a minimum of 6% at a LR of 90% (or greater). For each percentage reduction in the LR below 70% then the commission payable shall increase from 26% on the same linear basis.
- Lognormal with a CV = 25% assumed

Graphical Depiction: Discounted Economic Return Distribution



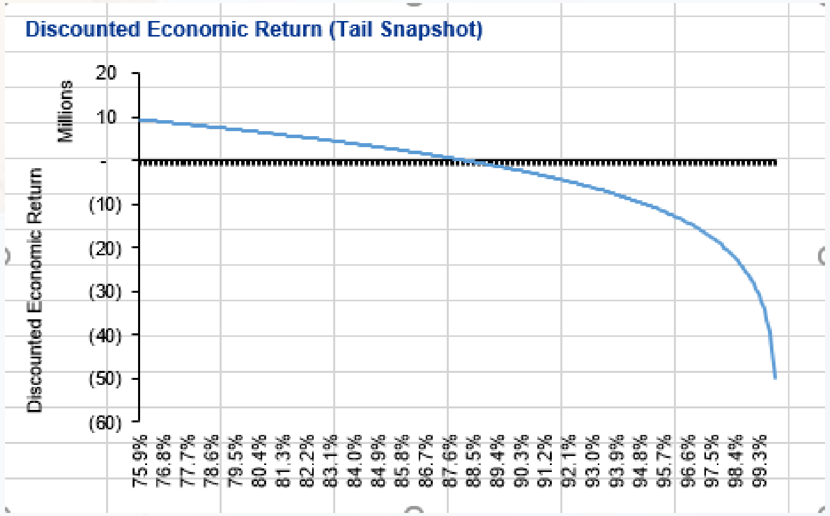
The flat distribution up to the 76th percentile is due to the operation of the ceding commission on the reinsurance structure, the floor combined ratio is 96% in this deal. Thereafter the economic return decays according to the log normally simulated losses.

Results

- The 90th percentile NPV loss is ($1.8M), which is 2.2% of the Net Premium, so this does not pass based on the 10-10 test
- The Expected Reinsurer Deficit is 1.56% so this does pass risk transfer based on the ERD test

Prem	82,606,100
# of losses	117
P(Loss)	11.71%
Avg Sev(Loss)	11,022,229
ERD	1.56%

Percentile	Discounted Economic Return
72%	9,359,271
73%	9,359,271
74%	9,359,271
75%	9,359,271
76%	9,359,271
77%	8,817,284
78%	8,201,439
79%	7,564,160
80%	6,903,305
81%	6,216,415
82%	5,500,643
83%	4,752,668
84%	3,968,584
85%	3,143,746
86%	2,272,574
87%	1,348,280
88%	362,480
89%	(695,340)
90%	(1,838,636)
91%	(3,085,013)
92%	(4,458,157)
93%	(5,991,013)
94%	(7,731,398)
95%	(9,752,631)
96%	(12,175,836)
97%	(15,223,783)
98%	(19,382,097)
99%	(26,111,996)



Documentation Typical Outline

- General Outline
  - Findings memo to decision maker
  - Summary of result distributions and risk metrics
  - Discussion of contract terms
  - Discussion of loss model, modeling of contract provisions, and discount rate assumptions
  - Expanded discussion where appropriate
- Documentation and Considerations
  - ASOP 41
  - Practice Note and other appropriate ASOP's

Summary

- The 10-10 rule provides an intuitive and straightforward measure of risk transfer. However, low-frequency, high-severity events may not be recognized under this approach.

- The ERD better recognizes such low-frequency, high-severity events. As such, reinsurers may wish to utilize ERD particularly if such events are part of the loss profile being transferred.

- Sensitivity testing is a crucial aspect of this exercise. In particular, CVs and payout patterns should be carefully selected by taking into account the various segments making up the portfolio.

Using the Coefficient of Variation for Not-Ad Hoc Evaluation of Risk Transfer

By Joseph Boor, FCAS, PhD, CERA (Retired, consulting occasionally)

joeboor@comcast.net, 850.766.6322

and Michelle Sun, FCAS, MAAA (Actuary, Norcal)

MSun@norcal-group.com, 512-350-0015

The Coefficient of Variation and Risk Transfer

Problems with Existing Methods for Evaluating Risk Transfer

- 10/10 rule (10% chance of at least a 10% loss)
  - Fails to pass high excess treaties with under 10% chance of hit
  - 10’s were ultimately determined subjectively., ad hoc.
- Expected Reinsurer Deficit (expected % of losses over 100% of premium)
  - What deficit is okay? 1% to match 10/10?
  - Amount is ultimately subjective
- Both focus on NAIC’s significant probability of significant loss, but don’t deal directly with what reinsurance does for the cedant

Suggestion: Require that Most Contracts Reduce Coefficient of Variation of Net Loss

- Coefficient of Variation (CV) is measure of riskiness relative to size.
- Why? CV = standard deviation of (net) loss , or volatility, divided by the mean.
- Requiring that reinsurance contract reduce CV of the net loss, means that the reinsurance makes the net losses less risky.

Other Benefits of Using the CV

- Not Ad-Hoc
- Wide Applicability, but other situations may have other issues.

NAIC Guidelines

- Reinsurer must assume significant insurance risk
  - After all, it's reducing the CV
- Reasonably possible that reinsurer may suffer a significant loss from the transaction
  - Consider this in light of later requirement for prudence.

Example

- Forgetting CV, ERD, 10/10, which of contracts appears to have risk transfer
- Base distribution: Pareto order 3, truncated and shifted by 20 (mean = 10)
- Options
  - Coverage all losses excess of $6
  - Underlying coverage all losses limited to $6

Which Covers Do You Think Contain Risk Transfer?-Tell Us on the Chat Feature

- Excess cover only
- Underlying cover only
- Both

Chat Feature Poll-Tell Us Which You Think Should Pass Risk Transfer and Why

Reason to Consider Requiring CV of Ceded Losses to be Larger than CV of Retained Losses

- Total Business: CV = 1.73
- Excess: CV = 1.19, obviously passes 10/10, ARG, CV
- Underlying : CV = .53, passes 10/10, No Expense ERD Ratio = 24%, passes base CV test because 1.19 < 1.73,

- The choice of requiring CV(ceded)>CV(retained) depends on whether reinsuring just the very limited underlying coverage should pass risk transfer

FPoll Question: Should One Require that CV(ceded)>CV(retained)?

- Yes
- No

Poll Results

What Should We Conclude from the Poll Results on CV(ceded)>CV(retained)?

Is it a Prudent Purchase?

Is the Net Cost of Reinsurance Less than the Cost of Any Additional Capital Needed to Cover the Losses Without Reinsurance?

- There are all kinds of treaties in reinsurance, a small part are viewed as passing income/profit more than transferring risk.
- Some actuaries I've spoken to are quite vocal that this must be addressed.
- Consider prudency of the purchase: Is the expense, profit and other markup of expected less than the cost of obtaining additional capital to cover the losses without reinsurance.

Computing Whether Contract is a Prudent Purchase- Key Factors

- Need type of criteria for needed capital-I like VaR-%likelihood that all claims will be covered (TVaR, etc., too)
- Need numerical criterion for capital-say 95% chance that all claims will be covered
  - Typically, would use current capital level after contract, maybe higher target amount for troubled companies
- Need cost of capital
  - Surplus note rate, cost of capital, increased if loan would lower credit rate/ stock sale overdilute capital.

Computing Whether Contract is a Prudent Purchase- Additional Capital

- Without treaty there is more volatility
- Could use loss ratio variance (in wheelhouse), etc. to estimate the 95% VaR, x%TVaR, x% VaR amount.
- That minus current capital funding is the additional capital needed
- Multiply that by cost of capital – for cost of foregoing reinsurance.
- Compare to net cost of reinsurance, as cedant estimates it.

CV Approach Appears to Comply with NAIC Risk Transfer Requirements

- Considering prudence requirement, losses transferred must be significant enough to require more capital, hence they are significant losses.
- Discussed earlier that reinsurance passing CV test, generate reasonable probability of those losses.
- CV approach appears to comply with NAIC requirements for risk transfer

A Couple of Caveats

- Consider that everything we don’t explicitly address would be unchanged from present practices
- In particular, all cash flows and values (except US loss reserves) are discounted.

Special Situations

Special “Fronted-Type” Programs

- Boiler and Machinery
- Cyber
- Umbrella (sometimes)
- Etc., all where reinsurer has special expertise and perhaps technology

- Consider cost of replicating risk selection and assessment (excluding any sales or marketing) along with cost of capital
- Allowing sales or marketing could open the door to transactions some regulators have concerns about.

Poll

- Which of the following could use the CV/prudent purchase approach? [yes /no]
  - A - Aggregate Excess
  - B – 50% cover on a new venture that “matches” a competitor’s profitable program with a substantial reinsurer’s profit
  - C – Loss Portfolio Transfers
  - D – Quota Share

Possible Poll Answers

- A-Aggregate Excess only
- B-New Ventures only
- C-Aggregate Excess and New Ventures
- D-Quota Share only
- E-Loss Portfolio Transfers only
- F-Quota Share and Loss Portfolio Transfers

Poll Results

Believe All but Quota Share and Loss Portfolio Transfers - Yes

- But for Quota Share and Loss Portfolio Transfers – Consider Financial Prudence- Why?

Quota Share and Loss Portfolio Transfers

- Purpose of Quota Share is to reduce Absolute Risk (Absolute Surplus Need)
  - This is contained in prudence, consider just requiring prudence of the purchase.
  - Loss Portfolio Transfers serve similar purpose---suggest similar treatment
  - May consider whether adding CV requirement would cause a problem with treaties that are appropriate.