AN EXPOSURE RATING APPROACH TO PRICING PROPERTY EXCESS OF LOSS REINSURANCE

Introduction:

Salzmann developed cumulative loss distributions by % of insured value to demonstrate the direct relationship between property size of loss distributions and amounts at risk.

The methodology employed by Salzmann is theoretically sound, however, the loss data used in her analysis differs significantly from that which is covered by a property excess of loss treaty.

Salzmann's Study:

The following individual claim and policy information was captured in the study:

Company:	INA
Line of Business:	Homeowners
Accident Year:	1960
Cause of Loss:	Fire
Coverage:	Building Losses Only (Coverage A)
Construction:	Frame, Brick
Protection:	Protected, Unprotected
Insured Values (Homeowners Cov. A Limit)	$10,000, $15,000, $20,000, $25,000.

Reasons for selecting Homeowners lines of business:

1. Insured Value, or policy amount, was a fair approximation of the amount at risk.
2. Underinsurance, if any, would be consistent by class, due to incentives to satisfy replacement cost requirements.

Only the building loss portion was considered, since it was assumed that these losses have the most direct relationship with the policy amount.

Salzmann constructed two tables:

- Cumulative Claim Count Distribution by % of Insured Value, and
- Cumulative Loss Cost Distribution by % of Insured Value.

To derive the $ amount of losses within the 1st X% of insured value, Salzmann combined:

1. X% of insured value, per claim, for claims > X% of insured value, and
2. 100% of the incurred loss, per claim, for those claims < X% of insured value.

Salzmann concluded that the relationship between size of loss distributions and insured values were **constant** across all amounts of insurance (10,000, $15,000, $20,000, $25,000).

Using Salzmann Tables to Price Reinsurance:

Exposure Rating is based on current or projected treaty year distribution of direct premium by policy limit.

- In property reinsurance, Salzmann Tables are used to estimate the proportion of losses falling within the layer being priced.
- In casualty reinsurance, ILFs are used to estimate the proportion of losses falling within the layer being priced.

The following example is shown in Exhibit 1, page 115.

Exposure Rating Example: $100,000 Excess of $100,000 Layer

Ceding Co.Retention: 100,000
Reinsurance Limit: 200,000

Coverage A Limit (1)	Direct Premium (2)	Ceding Co. Retention as a % of Cov. A Limit (3)	% Allocation of Total Premium (4)	Retention + Limit as a % of Cov. A Limit (5)	% Allocation of Total Premium (6)	Exposure Factor (6) - (4) (7)	Exposure Premium (2) * (7) (8)
25,000	200,000	400%	100%	267%	100%	0%	0
50,000	200,000	200%	100%	400%	100%	0%	0
75,000	200,000	200%	100%	267%	100%	0%	0
100,000	200,000	100%	100%	200%	100%	0%	0
200,000	200,000	50%	89%	100%	100%	11%	22,000
	1,000,000						22,000

Column 3 = Ceding Co. Retention / Column 1.
Column 5 = Reinsurance Limit / Column 1.
Column (3) %'s are used a lookup values in Salzmann Table 2 to determine the loss cost by % of insured value, with the results shown in Column (4).

Column (8) indicates that **the company will collect $22,000 in direct premium** to cover losses and expenses in the 100,000 xs 100,000 Layer.

To convert this to a **reinsurance premium**, several adjustments are necessary:

Exposure Rate Assumptions:

1. Expected **loss** ratio: .60. Removal of ceding company underwriting expenses can be accomplished by applying the ELR to the exposure premium.
2. ALAE load: 1.10 This allows for the reinsurer to share the cost of ALAE.
3. Rate adequacy adjustment factor 1.00 This allows for any perceived inadequacy in the ceding company's rates.
4. Expense and profit load 100/ 80ths

$$Exposure\ Rate = \frac{Exposure\ premium * ELR * ALAE\ Load}{Total\ \text{Pr}emium} * Rate\ adequacy\ factor * Expense\ \&\ profit\ load$$

$$\frac{\$22{,}000 * .60 * 1.1}{1{,}000{,}000} * 1.0 * \frac{100}{80} = 1.82\%$$