
PROPERTY PROPORTIONAL REINSURANCE

SEMINAR SESSION IV

Summaries, Supplementary Questions and Solutions

SYLLABUS READINGS REFERENCED

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Clark – Property Proportional Reinsurance

1. Introduction

- A proportional treaty is an agreement between a reinsurer and a ceding company (the reinsured) in which the reinsurer assumes a given percent of losses and premium.
- Clark discusses the following types of proportional **property** reinsurances:
 - ❶ Quota share (see Introduction to Reinsurance section for more detail)
 - ❷ Surplus share (see Introduction to Reinsurance section for more detail)

Other types of proportional reinsurances (non-property):

Fixed and variable quota share (a.k.a. surplus share) arrangements on excess business (e.g. umbrella policies). In these arrangement, the underlying business is excess of loss, but the reinsurer takes a proportional share of the ceding company's business.

2. Property proportional pricing system (6 easy steps)

Clark identifies the following six steps in pricing property proportional treaties.

Step 1	<p>Compile the historical experience on the treaty</p> <p>Actual treaty premium and incurred losses for five or more years should be accumulated. If treaty experience is not available, the gross experience (i.e. prior to the reinsurance treaty) can be adjusted "as if" the treaty had been in place. This adjustment can be especially important in the evaluation of a surplus share treaty.</p>
Step 2	<p>Exclude catastrophe and shock losses</p> <p>Catastrophe losses results from a particular event/occurrence that impacts more than one risk (e.g., hurricane or earthquake). Shock losses are large losses that usually impact only a single policy/risk. Both types of losses can distort results. Can these concepts be applied to casualty reinsurances?</p>
Step 3	<p>Adjust historical experience to ultimate and project forward</p> <p><i>Losses</i></p> <ol style="list-style-type: none"> 1. Develop losses to ultimate 2. Trend losses forward to anticipated average date of occurrence. <p><i>Premiums</i></p> <ol style="list-style-type: none"> 1. Put on-level (Clark specifically mentions use of the parallelogram method) 2. Note: The impact of rate changes anticipated during the treaty period should also be included. This requires judgment since these changes may not yet have been filed for or approved. 3. If the exposure base is inflation-sensitive (e.g., insured value/amount of insurance for property risks), an exposure inflation factor should be used to project historical exposure amounts forward.
Step 4	<p>Select the non-catastrophe loss ratio</p> <p>For reasonableness, compare the selection to the ceding company's actual gross experience and industry averages.</p>
Step 5	<p>Load selected loss ratio for catastrophes</p> <p>(see below for more)</p>

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Step 6	Estimate the combined ratio Requires consideration of: 1. Ceding Commission 2. Reinsurer's general expenses and overhead 3. Brokerage fees (where applicable)
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More on loading for catastrophes:

The historical loss experience used above is generally not sufficiently predictive to use as the basis for determining a catastrophe load. The catastrophe load, however, is a critical part of the pricing of most property treaties. Four approaches are mentioned:

- 1) Use **average catastrophe loads** based on the projected distribution of premium by state. These load can be obtained from rate filings, ISO circulars, or they can be estimates based on the reinsurer's experience/judgment.
- 2) Since most property proportional treaties now contain a per occurrence limit, an estimate of the expected **number of times the occurrence limit will be exhausted** per year can be developed.

Example:

Treaty occurrence limit: \$25,000,000

Limit is expected to be exhausted once in every five year interval

Annual catastrophe load is therefore \$5,000,000

[This is a rate-on-line approach, see *Catastrophe section* for more].

- 3) Evaluate historic catastrophe losses over a longer experience period. Historic losses need to be adjusted for changes in price and exposure levels.
- 4) Use the catastrophe load indicated by a catastrophe simulation model (*for more on cat modeling, see the Clark handout on catastrophe coverages*).

Question: Is a catastrophe load appropriate for casualty treaty pricing?

More on cost accumulation periods:

1. "Losses occurring" treaties provide coverage based on date of claim occurrence. For these treaties, experience is accumulated on an accident year basis. Subject base is earned premium during the coverage term.
2. "Risks attaching" treaties provide coverage for policies that become effective during the treaty period. For these treaties, experience is accumulated on a policy year basis. Subject base is written premium during the coverage term.

Last "step" (but not one of the six steps above): Accept or reject the business.

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In addition to the estimated combined ratio (step 6), the reinsurer should take into account the following items to determine if the treaty provides an acceptable return:

- potential investment income
- the risk level of the exposures

3. Detailed Example:

Property quota share treaty effective 1/1/97

Losses occurring coverage

Historical Experience at 9/30/96

Accident Year	Earned Premium	Case Incurred Losses/ALAE	Loss Ratio to date
	(1)	(2)	(3)=(2)/(1)
1991	1,640,767	925,021	56.4%
1992	1,709,371	2,597,041	151.9%
1993	1,854,529	1,141,468	61.6%
1994	1,998,751	1,028,236	51.4%
1995	2,015,522	999,208	49.6%
1996	1,550,393	625,830	40.4%
Total	10,769,333	7,316,804	67.9%

Notes:

Accident Year 1992 losses include **\$ 1,582,758**
due to Hurricane Andrew

Trended and Developed Losses

Accident Year	Inurred Losses (excl. cats)	LDF	Ultimate Losses (excl. cats)	Trend Factor at 4%	Trended Ult Losses (excl. cats)
	(1)	(2)	(3)=(1)x(2)	(4)	(5)=(3)x(4)
1991	925,021	1.000	925,021	1.265	1,170,152
1992	1,014,283	1.000	1,014,283	1.217	1,234,382
1993	1,141,468	1.000	1,141,468	1.170	1,335,518
1994	1,028,236	1.000	1,028,236	1.125	1,156,766
1995	999,208	1.075	1,074,149	1.082	1,162,229
1996	625,830	1.600	1,001,328	1.040	1,041,381
Total	5,734,046	n/a	6,184,485	n/a	7,100,427

Notes:

Annual rate of loss trend selected at 4.0%
LDF for Accident Year 1996 projects incurred losses through the full accident year

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Rate change information

Effective Date	Average Rate Change
01/01/91	2.00%
01/01/93	10.00%
07/01/94	-4.00%
04/01/97	10.00% (pending)

The +10% rate increase to be effective 4/1/97 is an estimate based on the rate filing that the ceding company expects to make.

On-Level Premiums

Calendar Year	Unadjusted Earned Premium	On Level Factor	Trend Factor at 3%	On-Level Premium
	(1)	(2)	(3)	(4)=(1)x(2)x(3)
1991	1,640,767	1.096	1.194	2,147,147
1992	1,709,371	1.086	1.159	2,151,541
1993	1,854,529	1.034	1.126	2,159,198
1994	1,998,751	0.992	1.093	2,167,158
1995	2,015,522	1.023	1.061	2,187,654
1996	2,067,191	1.028	1.030	2,188,824
Total	11,286,131	n/a	n/a	13,001,522

Notes:

Annual rate of exposure trend (change in property value) at 3.0%
 1996 earned premium adjusted to full-year (9-month value multiplied by 4/3)
 On-level factors determined using the parallelogram method. They assume that the 4/1/97 rate increase will occur.

Projected Loss Ratio

Accident Year	Trended Ult Losses (excl. cats)	On-Level Premium	Projected Loss Ratio
	(1)	(2)	(3)=(1)/(2)
1991	1,170,152	2,147,147	54.5%
1992	1,234,382	2,151,541	57.4%
1993	1,335,518	2,159,198	61.9%
1994	1,156,766	2,167,158	53.4%
1995	1,162,229	2,187,654	53.1%
1996	1,041,381	2,188,824	47.6%
Total	7,100,427	13,001,522	54.6%