

Complete the Loop: Reinsurance Reserving to Pricing

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Sarah Krutov, FCAS, MAAA, CERA
CRO and Chief Reserving Actuary, Americas



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Reserving-To-Pricing: Feedback Loop

1	Critical pricing parameters
2	What do reserving people know better
3	Hot or Cold - Examples
4	Joint Effort: Step-by-Step
5	Conclusions

Pricing Parameters – What Can Be Tested? Actual Versus Expected Framework

- Business mix
- Contract terms
- Loss and premium data
- Data you exclude
- Frequency/severity trend
- Exposure trend
- Rate changes
- Emergence/payout patterns
- Premium flows
- Appropriate benchmarks/defaults
- CAT loads
- Loss distributions

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What Do Reserving People Know Better? But Later...

	Yes	No
Cedant loss and premium data	😊	
Mix of business	😊	
Emergence/payout pattern	😊	
Premium flows	😊	
Large losses	😊	
Everything else?	😊	

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Hindsight is 20/20

- ❑ **Cedant's Data.** Always a good idea to make sure you are looking at the same thing
 - How does the renewal submission compare to what is on the books?
 - How much credibility should be given to an “as if” presentation? Particularly the one that excludes certain “unusual” claims?
 - Could the remaining difference be explained by reporting lag?
 - Be prepared to deal with accident year vs. underwriting year presentations.
- ❑ **Emergence patterns**
 - As expected?
 - For high excess – high loss cost/ultimate loss sensitivity.
- ❑ **Payout** – faster or slower? **Premium collection** – faster or slower? Could make or break the ROE.

Unfortunately, some of the profound revelations take time to make themselves known. Even to the reserving actuaries.

The Fact Is

- ❑ When the ultimate outcomes are known, it's often too late and not very useful.
- ❑ However, having some facts could be better than running on pure assumptions.
- ❑ But one should be careful in not confusing the two.
- ❑ For example, a real life loss development factor triangle

Accident Year	1	2	3	4	5
1992					1.031
1993				1.108	1.113
1994			1.124	1.112	1.050
1995		1.397	1.198	1.115	0.974
1996	2.224	1.299	1.193	1.072	1.122
1997	2.345	1.090	1.145	1.176	1.162
1998	2.451	1.192	1.468	1.248	1.168
1999	2.129	1.526	1.334	1.202	
2000	2.471	1.385	1.370		
2001	2.192	1.331			
2002	2.342				

A trend or an anomaly?

Actual Versus Expected: Loss Development

Question to answer is “Is there appreciable difference?”

- ❑ If yes, then why?
 - Got the mix of business wrong?
 - Got the reporting assumptions wrong?
 - Anything else?
- ❑ Is it a trend or an anomaly?
- ❑ Higher LDF's at earlier ages mean
 - a) Speed up – all of the development happens upfront, and the tail is shorter?
 - b) Lengthening – LDF's at later ages will be higher as well?

Example: General Liability

Ultimate Loss	@12 months	@24	@36	@48	@60	@72	@84	@96	@108	@120
Expected = 1,000,000	241,036	531,442	766,445	909,726	956,416	971,039	974,240	977,307	981,876	1,000,000
Expected ATU LDF	4.149	1.882	1.305	1.099	1.046	1.030	1.026	1.023	1.018	1.000
Actual = 1,000,000	197,496	424,920	603,944	728,849	782,356	822,393	856,260	885,012	909,927	930,000
Implied	819,364	799,561	787,981	801,174	818,008	846,921	878,901	905,562	926,722	930,000

What happened ????

- Expected – Prem/Ops
- Actual – Products

Portfolio vs. Individual Account

- ❑ Arguably, impossible to see trends on an individual account basis. Solution: Use Portfolios.
 - Ensure consistent definitions between pricing and reserving:
 - Does the liability section of homeowners treaties go into property or casualty class in your reserving system?
- ❑ Reserving classes could be heterogeneous. Hard to identify appropriate patterns for in-force book. Solution: analyze individual treaties.
 - Pick a materiality threshold. Consider
 - Credibility
 - Time and effort

Applicability of portfolio experience

- ❑ Consider and adjust for
 - Change in attachment points
 - Underlying treaties' inception dates
 - Geographical distribution
 - Extraordinary losses
- ❑ Possible adjustments could be in form of relativity factors based on industry benchmarks
 - RAA LDF's by range of attachment point
 - ISO/NCCI LDF's by layer
- ❑ Adjusted company experience could be used to validate pricing benchmark LDF's

The Cycle Messes It All Up.

- ❑ On the downslope – overstate or understate
 - Rate drop
 - Loss ratio
- ❑ If combined with lousy economy?
 - Could the spread between CPI and severity trend be affected?
- ❑ Are there trends in LDF's?
 - Reporting lag – could be measured in reserving data
 - Affects the tail
 - Case reserve may lag if the spread expands
- ❑ LDF triangle (the real life one)

Underwriting Cycle Affects the Loss Development Patterns

Reinsurance Association of America (RAA) Loss Development Study
Presented by Chris Bozman, FCAS, MAAA (TW) at the CLRS 2011

Accident Year	1	2	3	4	5	6	7	8	9	10	11
1988						1.082	1.061		1.022	0.998	1.001
1989					1.062	1.044		0.989	0.996	1.010	0.969
1990				1.092	1.095		0.977	0.998	1.037	0.992	1.005
1991			1.264	1.142		1.032	1.052	1.041	1.023	1.057	1.019
1992		1.255	1.060		1.031	1.052	1.016	1.041	1.102	1.057	1.030
1993	2.689	1.305		1.108	1.113	1.043	1.014	1.096	1.091	1.008	1.020
1994	2.321		1.124	1.112	1.050	1.067	1.089	1.060	1.037	1.085	1.107
1995		1.397	1.198	1.115	0.974	1.059	1.137	1.094	1.129	1.059	1.032
1996	2.224	1.299	1.193	1.072	1.122	1.153	1.123	1.064	1.096	1.076	1.032
1997	2.345	1.090	1.145	1.176	1.162	1.150	1.118	1.088	1.066	1.058	1.068
1998	2.451	1.192	1.468	1.248	1.168	1.131	1.102	1.111	1.084	1.127	
1999	2.129	1.526	1.334	1.202	1.169	1.154	1.088	1.060	1.091		
2000	2.471	1.385	1.370	1.309	1.174	1.161	1.103	1.099			
2001	2.192	1.331	1.472	1.267	1.175	1.145	1.092				
2002	2.342	1.387	1.465	1.230	1.176	1.097					
2003	1.853	1.213	1.178	1.111	1.110						
2004	2.645	1.278	1.226	1.166							
2005	2.460	1.208	1.093								
2006	2.258	1.243									
2007	2.286										
2008											

Straight averages

1988-96	2.411	1.314	1.168	1.107	1.064	1.066	1.059	1.048	1.059	1.038	1.024
1997-01	2.318	1.305	1.358	1.240	1.170	1.148	1.101	1.089	1.080	1.093	1.068
post 2001	2.307	1.266	1.240	1.169	1.143	1.097	NA	NA	NA	NA	NA

Miscellaneous

- ❑ Classic Five. The claims excluded from experience. They'll never happen again. In pricing, used a large loss (or CAT) load.
- ❑ Did the experience support the approach?

- ❑ Return on Equity. Do cash flow assumptions come through as expected?

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Process: Communication Points

Pricing Parameter / Indication	Timing of Test	Reserving Tool
Business Mix	When treaty reaches meaningful volume	Actual vs. Expected
Loss and Premium Data (renewals)	Before pricing analyses	Rigorous comparison of historical experience vs. submission
Exclusions	All reserving reviews	Data analysis
Frequency/Severity Trends	Annually	Observed aggregate frequency/severity
Expected Rate Changes	On contract expiration	Actual vs. expected analysis
Emergence/Payout Patterns	Annually	Aggregate and contract-specific comparison of expected to actual patterns
Premium flows	Prior to renewal	Actual vs. expected
Benchmarks	Annually	Portfolio vs. benchmark
Loss Distributions	Annually	Size of loss analysis

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Connect the Dots

- ❑ Sadly, reserving actuaries do not know everything
- ❑ But what they do see, should be shared with pricing (and underwriting)
- ❑ Particularly when things look different from expected in terms of
 - Exposure (losses happen to be products as opposed to prem/ops or PPO instead of LS)
 - Number of large losses (or CAT's)
 - Loss emergence or payout pattern
 - Premium flows
- ❑ Knowing what happens with the rates (within the cycle) could help distinguish patterns from aberrations
- ❑ So together Pricing and Reserving could get it right (almost)