Seminar on Reinsurance

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Intro to Experience & Exposure Rating

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Experience Rating

Process Steps & Methodology

1) Compile historical / projected premium (or exposures), historical / projected rate change, and individual large loss & ALAE data
2) Adjust historical subject premium to prospective period rate level
3) Adjust historical losses to future price and treaty coverage levels
4) Develop adjusted layer losses to ultimate (estimate Incurred but not Reported (IBNR) for Reported, Unpaid for Paid)
5) Select non-catastrophe / non-shock experience loss & ALAE
6) Load for any catastrophe or shock losses, which may be considered over a longer selection horizon than non-cat

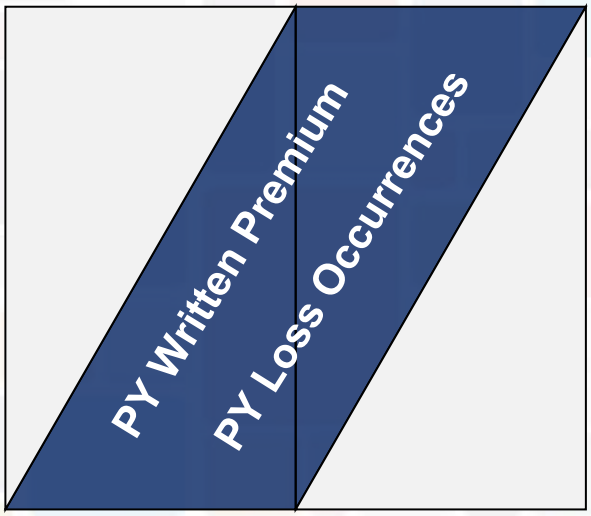
Experience Rating

<u>Step 1:</u> Compile Historical Experience

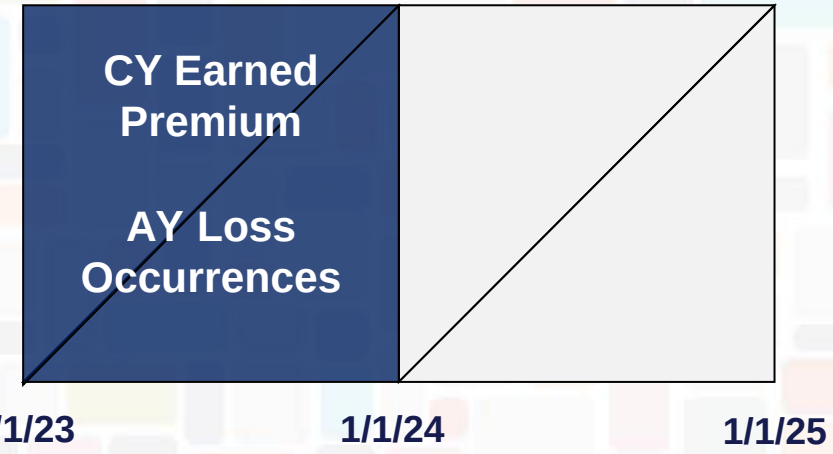
- Historical premiums and losses should align in time to link loss outcomes with the exposures they mostly likely emanated from:
  - Calendar Year (CY) Earned Premiums with Accident Year (AY) Losses
  - Policy Year (PY) Written Premiums with Policy Year Losses
- Either of the above datasets can be used to rate either of the most common prospective treaty accounting periods, with only the trend period changing between approaches. However, typically there is a preference to use:
  - CY / AY for “Losses Occurring” / “Losses Occurring During”
  - PY / PY for “Risks Attaching” / “Losses Occurring on Risks Attaching”

Experience Rating

Step 1: Compile Historical Experience



- PY WP and PY Loss link back to the effective date of when the actual policy was written, mapping to the actual underlying exposure



- CY EP and AY Loss could come from policies written in the current or prior period (e.g. assuming one year policies), not necessarily mapping to the actual underlying exposure

Experience Rating

Step 1: Compile Historical Experience

- Gather all losses with necessary attributes:
  - Large claims at half the retention of lowest XOL accounts for trending
  - Split out Allocated Loss Adjustment Expense (ALAE)
    - ALAE at the policy level is often treated differently by LOB. For reinsurance, ALAE can be excluded, included, or ceded pro rata
  - Include historical policy terms if available: 100% Limit, Company Limit, Attachment, Self-Insured Retention (SIR)
    - Common practice to trend claims from ground-up, i.e. add back attachment + self-insured retention, and cap at historical policy limit
    - Another approach is to simply trend the net of policy term loss amounts directly at an appropriately higher excess trend factor
- Ensure losses can aggregate in line with treaty (claimant, occurrence)
- Consider if 'As Iffing' experience is appropriate
  - Has the ceding company exited a class? Have typical policy terms materially changed such that a historical adjustment is warranted?
- Include catastrophe / clash indicator so data can be separated

Experience Rating

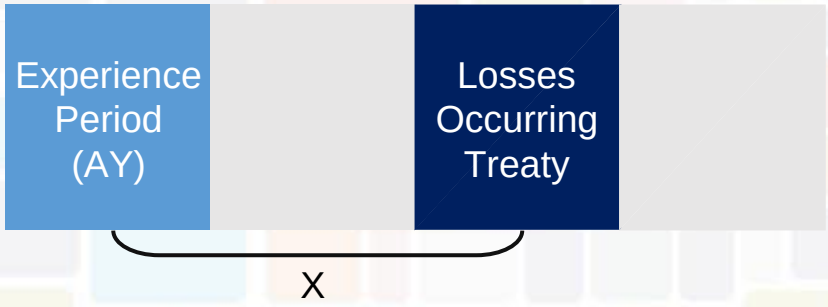
Step 2: Adjust subject premium to prospective level

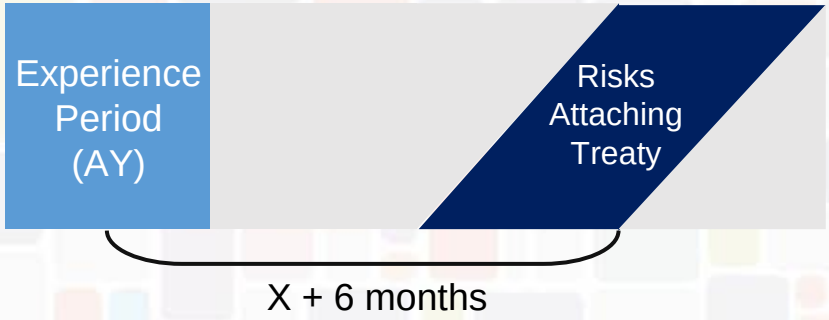
- Goal: adjust premium to level "as if" written during prospective period
- Premium typically "on-leveled" using rate changes:
  - Filed (manual) rate changes may be available for some LOBs, otherwise cedent rate changes on renewal business often utilized
    - Have renewals been adjusted for changing policy terms?
    - Should rate levels on new business be considered in the on-leveling?
    - Are policy changes and/or exposure trend factored into the calculation?
  - Price-level changes
    - Schedule rating, company tiers, etc. should be incorporated
    - "Soft" changes may be considered, such as terms & conditions, changes in underwriting standards, etc.
  - Exposure trend applied for inflation-sensitive exposure bases
    - Workers' compensation: payroll, which is influenced by wage trends
    - Auto: # of cars, which is not inflation sensitive

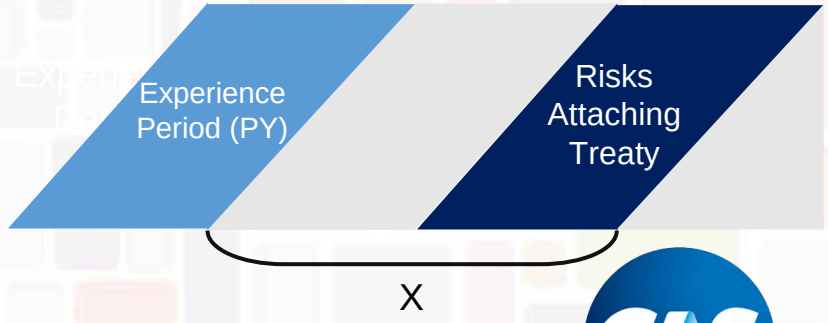
Experience Rating

Step 3: Adjust losses to prospective level

- Loss trend can be selected from industry sources, the cedent's actual experience, or judgment – and can vary by year
- Loss trend periods vary based on experience & treaty average accident dates





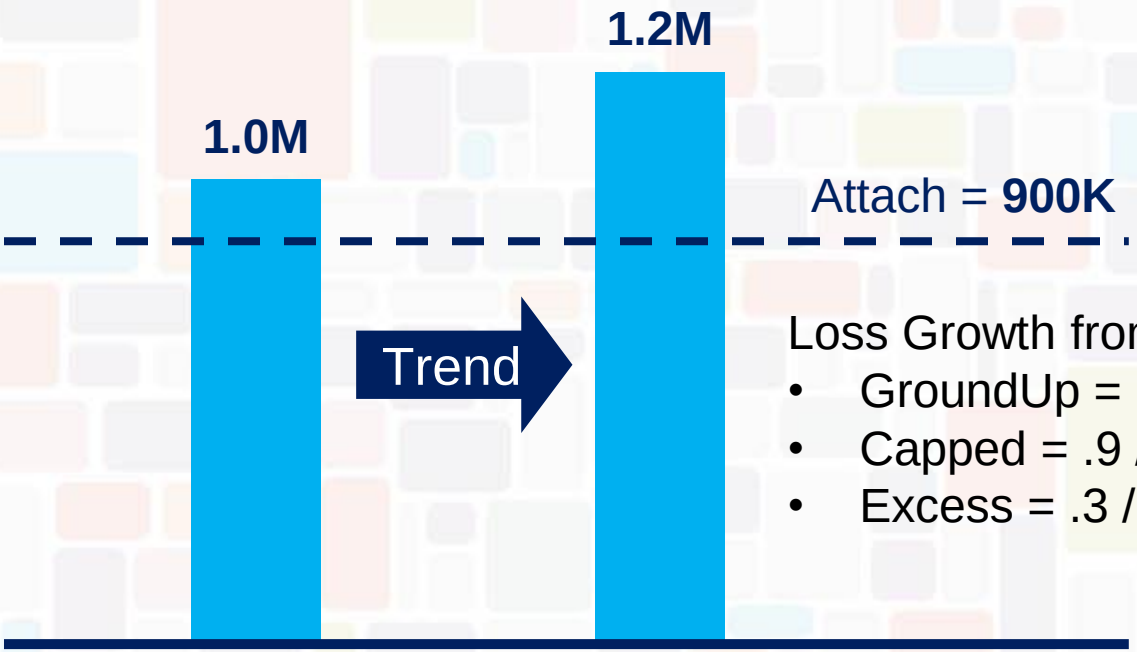


Note: Premium on-leveling applies similarly

Experience Rating

Step 3: Adjust losses to prospective level

- Trended losses imply a trend to excess layers that is **leveraged higher**
- Ground-up trended losses can be split between the capped and excess portions to understand the effect



Loss Growth from Trend:

- GroundUp = 1.2 / 1 - 1 = **20%**
- Capped = .9 / .9 - 1 = **0%**
- Excess = .3 / .1 -1 = **200%**

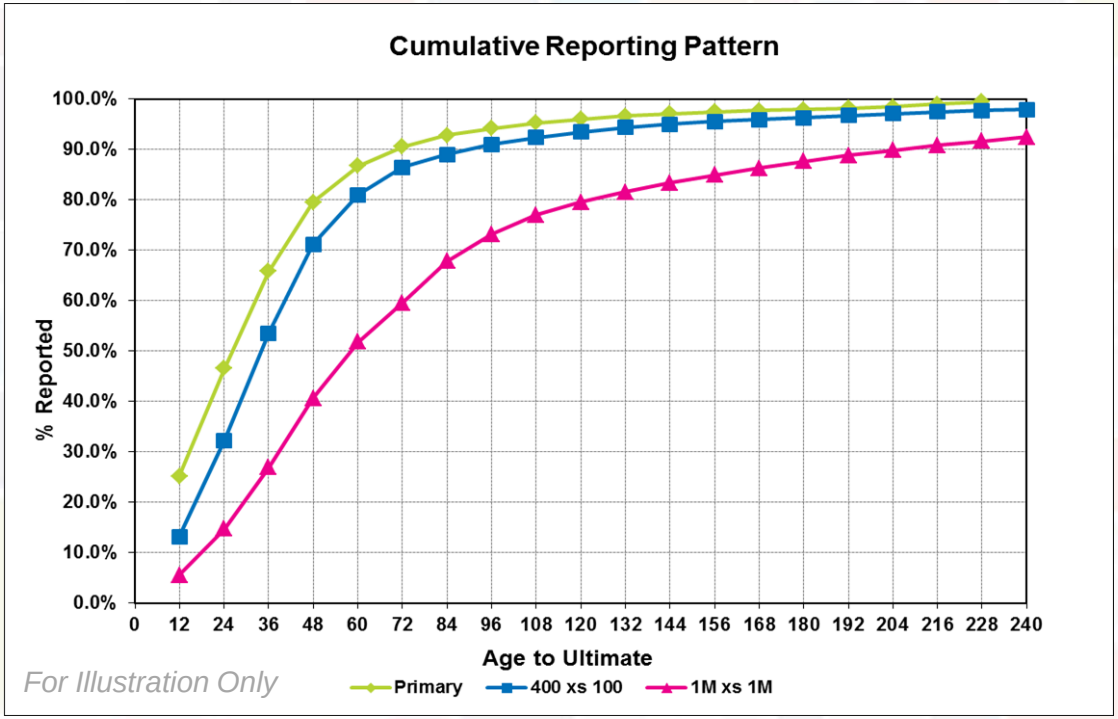
Experience Rating

Step 4: Develop losses to ultimate

- Loss development factors (LDF) depend on reinsurance layer priced
  - Lower attaching layers tend to start / stop developing sooner than higher
  - Can be challenging to select LDFs for higher layers where data is sparse
- Losses should be individually trended to the same cost level before triangulating the trended claims to reduce distortions in excess triangles
  - *"Are recent year losses only developing into the layer sooner than older years because they're at higher cost levels? Or is it true development?"*
- Common to develop layer losses in aggregate, effectively including all of:
  - New Claim Development (true IBNR = Incurred but not Reported)
  - Known Claim Development (IBNER = Not "Enough" Reported)
- Examples of Development Approaches:
  - **Chain Ladder / LDF Method** = loss * historical triangle growth patterns
  - **Cape Cod** = B-F approach where a priori calculated with actual experience
    - C-L less reliable in recent years given uncertainty in current loss amount

Experience Rating

Step 4: Develop losses to ultimate



- In this example, the higher attaching the layer, **the slower the development**
- One logical reason this is true is that larger losses often take longer to assess and grow into their true incurred values
- Retention isn't all – layer limit matters as losses get capped sooner for lower limits

Steps 5 & 6 illustrated via example (next slide)

Experience Rating – Example

Structure:

- Umbrella Insurance Company A
- 5M xs 5M excess of loss treaty
- Losses Occurring During
- ALAE included in treaty limit
- 1/1/23 – 12/31/23 term
- 100% of policies are supported umbrella attaching at 1M
- New CUO started in 2019 with a goal to improve the portfolio

Experience Rating – Example

Step 1: Compile Historical Experience

Calendar Year	Written Premium	Earned Premium
2012	25,000,000	22,500,000
2013	30,000,000	27,500,000
2014	35,000,000	32,500,000
2015	40,000,000	37,500,000
2016	45,000,000	42,500,000
2017	50,000,000	47,500,000
2018	55,000,000	52,500,000
2019	35,000,000	45,000,000
2020	37,500,000	36,250,000
2021	40,000,000	38,750,000
2022	45,000,000	42,500,000
Projected 2023:	55,000,000	50,000,000

Historical Losses >= $2.5M as of 9/30/22

Date of Loss	Policy Eff Date	AY	Claim #	Policy Limit	Attachment Point	Indemnity	ALAE	Total Rept L+ALAE
1/1/2012	9/1/2011	2012	1	10,000,000	1,000,000	5,000,000	1,000,000	6,000,000
11/1/2012	7/1/2012	2012	2	7,500,000	1,000,000	7,500,000	900,000	8,400,000
1/1/2013	9/1/2012	2013	3	10,000,000	1,000,000	10,000,000	800,000	10,800,000
4/1/2013	12/1/2012	2013	4	5,000,000	1,000,000	4,000,000	700,000	4,700,000
7/1/2013	3/1/2013	2013	5	2,500,000	1,000,000	1,600,000	1,000,000	2,600,000
10/1/2014	6/1/2014	2014	6	10,000,000	1,000,000	8,000,000	500,000	8,500,000
5/1/2015	1/1/2015	2015	7	7,500,000	1,000,000	2,250,000	400,000	2,650,000
6/1/2015	2/1/2015	2015	8	10,000,000	1,000,000	10,000,000	500,000	10,500,000
7/1/2015	3/1/2015	2015	9	5,000,000	1,000,000	4,000,000	300,000	4,300,000
8/1/2015	4/1/2015	2015	10	2,500,000	1,000,000	2,500,000	200,000	2,700,000
5/1/2016	1/1/2016	2016	11	7,500,000	1,000,000	5,940,000	500,000	6,440,000
7/1/2016	3/1/2016	2016	12	10,000,000	1,000,000	10,000,000	1,000,000	11,000,000
8/1/2017	4/1/2017	2017	13	7,500,000	1,000,000	7,500,000	900,000	8,400,000
9/1/2017	5/1/2017	2017	14	7,500,000	1,000,000	5,500,000	1,000,000	6,500,000
9/1/2017	5/1/2017	2017	15	2,500,000	1,000,000	1,880,000	1,000,000	2,880,000
6/1/2018	2/1/2018	2018	16	10,000,000	1,000,000	10,000,000	200,000	10,200,000
11/1/2018	7/1/2018	2018	17	10,000,000	1,000,000	10,000,000	1,000,000	11,000,000
8/1/2020	4/1/2020	2020	18	7,500,000	1,000,000	5,000,000	1,000,000	6,000,000
12/1/2020	8/1/2020	2020	19	5,000,000	1,000,000	1,960,000	1,000,000	2,960,000
7/1/2021	3/1/2021	2021	20	2,500,000	1,000,000	1,790,000	1,000,000	2,790,000

For an LOD treaty, prefer to pair Earned Premium with Accident Year losses

Experience Rating – Example

Step 2: Adjust subject premium to prospective level

	(1)	(2)	(3)	(4)	(5)	(6)
Year	Earned Premium	Rate Change	Exposure Trend	On-level Factor	Exposure Trend Factor	On-level Earned Premium
2012	22,500,000	3.00%	1.00%	1.933	1.172	50,965,885
2013	27,500,000	2.50%	1.00%	1.881	1.160	60,026,381
2014	32,500,000	3.00%	1.00%	1.831	1.149	68,355,990
2015	37,500,000	0.00%	1.00%	1.795	1.137	76,571,273
2016	42,500,000	1.00%	1.00%	1.795	1.126	85,921,560
2017	47,500,000	5.00%	1.00%	1.734	1.115	91,852,911
2018	52,500,000	9.00%	1.00%	1.636	1.104	94,809,494
2019	45,000,000	12.50%	1.00%	1.494	1.093	73,463,940
2020	36,250,000	15.00%	1.50%	1.306	1.077	50,972,801
2021	38,750,000	10.00%	2.00%	1.149	1.056	47,004,975
2022	42,500,000	7.00%	3.00%	1.060	1.025	46,161,519
2023	50,000,000	5.00%	2.50%	1.000	1.000	50,000,000
	(1) & (2) provided					
	(3) based on industry/client data					
	(4) and (5) calculated from (2) and (3)					
	(6) = (1) * (4) * (5)					

Experience Rating – Example

Step 3: Adjust losses to prospective level

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Date of Loss	AY	Claim #	Policy Limit	Attachment Point	Indemnity	ALAE	Total Rept L+ALAE	Trend Factor	Trended Indemnity	Trended ALAE	Trended L+ALAE	Reported Layer L+ALAE	Trended Layer L+ALAE
1/1/2012	2012	1	10,000,000	1,000,000	5,000,000	1,000,000	6,000,000	1.71	9,262,036	1,710,339	10,972,376	1,000,000	5,000,000
11/1/2012	2012	2	7,500,000	1,000,000	7,500,000	900,000	8,400,000	1.71	7,500,000	1,539,305	9,039,305	3,400,000	4,039,305
1/1/2013	2013	3	10,000,000	1,000,000	10,000,000	800,000	10,800,000	1.63	10,000,000	1,303,116	11,303,116	5,000,000	5,000,000
4/1/2013	2013	4	5,000,000	1,000,000	4,000,000	700,000	4,700,000	1.63	5,000,000	1,140,226	6,140,226	-	1,140,226
7/1/2013	2013	5	2,500,000	1,000,000	1,600,000	1,000,000	2,600,000	1.63	2,500,000	1,628,895	4,128,895	-	-
10/1/2014	2014	6	10,000,000	1,000,000	8,000,000	500,000	8,500,000	1.55	10,000,000	775,664	10,775,664	3,500,000	5,000,000
5/1/2015	2015	7	7,500,000	1,000,000	2,250,000	400,000	2,650,000	1.48	3,801,730	590,982	4,392,712	-	-
6/1/2015	2015	8	10,000,000	1,000,000	10,000,000	500,000	10,500,000	1.48	10,000,000	738,728	10,738,728	5,000,000	5,000,000
7/1/2015	2015	9	5,000,000	1,000,000	4,000,000	300,000	4,300,000	1.48	5,000,000	443,237	5,443,237	-	443,237
8/1/2015	2015	10	2,500,000	1,000,000	2,500,000	200,000	2,700,000	1.48	2,500,000	295,491	2,795,491	-	-
5/1/2016	2016	11	7,500,000	1,000,000	5,940,000	500,000	6,440,000	1.41	7,500,000	703,550	8,203,550	1,440,000	3,203,550
7/1/2016	2016	12	10,000,000	1,000,000	10,000,000	1,000,000	11,000,000	1.41	10,000,000	1,407,100	11,407,100	5,000,000	5,000,000
8/1/2017	2017	13	7,500,000	1,000,000	7,500,000	900,000	8,400,000	1.34	7,500,000	1,206,086	8,706,086	3,400,000	3,706,086
9/1/2017	2017	14	7,500,000	1,000,000	5,500,000	1,000,000	6,500,000	1.34	7,500,000	1,340,096	8,840,096	1,500,000	3,840,096
9/1/2017	2017	15	2,500,000	1,000,000	1,880,000	1,000,000	2,880,000	1.34	2,500,000	1,340,096	3,840,096	-	-
6/1/2018	2018	16	10,000,000	1,000,000	10,000,000	200,000	10,200,000	1.28	10,000,000	255,256	10,255,256	5,000,000	5,000,000
11/1/2018	2018	17	10,000,000	1,000,000	10,000,000	1,000,000	11,000,000	1.28	10,000,000	1,276,282	11,276,282	5,000,000	5,000,000
8/1/2020	2020	18	7,500,000	1,000,000	5,000,000	1,000,000	6,000,000	1.16	5,945,750	1,157,625	7,103,375	1,000,000	2,103,375
12/1/2020	2020	19	5,000,000	1,000,000	1,960,000	1,000,000	2,960,000	1.16	2,426,570	1,157,625	3,584,195	-	-
7/1/2021	2021	20	2,500,000	1,000,000	1,790,000	1,000,000	2,790,000	1.10	2,075,975	1,102,500	3,178,475	-	-

(1) - (7) provided in submission	(10) = Min{ [(6) + (5)] * (9) - (5), (4) }	(13) = Min [$5M, Max{ $0, (8) - $5M}]
(8) = (6) + (7)	(11) = (9) * (7)	(14) = Min [$5M, Max{ $0, (12) - $5M}]
(9) based on industry data	(12) = (10) + (11)	

Experience Rating – Example

Step 4-6: Develop adjusted layer losses to ultimate & select experience loss & ALAE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
AY	Historical SEP	Reported Layered L+ALAE	Rept Layer Loss Cost	Onlevel Earned Premium	Trended Layer L+ALAE	Trended Layer Loss Cost	CDF	% Rept	CL Ult & Trended Layer L+ALAE	CL Ult & Trended Layer Loss Cost	BF Ult & Trended Layer L+ALAE	BF Ult & Trended Layer Loss Cost
2012	22,500,000	4,400,000	19.56%	50,965,885	9,039,305	17.74%	1.08	93.0%	9,717,253	19.07%	9,544,874	18.73%
2013	27,500,000	5,000,000	18.18%	60,026,381	6,140,226	10.23%	1.13	88.6%	6,930,780	11.55%	7,113,733	11.85%
2014	32,500,000	3,500,000	10.77%	68,355,990	5,000,000	7.31%	1.21	82.4%	6,067,031	8.88%	6,709,326	9.82%
2015	37,500,000	5,000,000	13.33%	76,571,273	5,443,237	7.11%	1.33	74.9%	7,265,343	9.49%	8,173,666	10.67%
2016	42,500,000	6,440,000	15.15%	85,921,560	8,203,550	9.55%	1.53	65.1%	12,592,112	14.66%	12,461,232	14.50%
2017	47,500,000	4,900,000	10.32%	91,852,911	7,546,182	8.22%	1.84	54.3%	13,899,695	15.13%	13,515,833	14.71%
2018	52,500,000	10,000,000	19.05%	94,809,494	10,000,000	10.55%	2.30	43.4%	23,024,384	24.28%	17,625,501	18.59%
2019	45,000,000	-	0.00%	73,463,940	-	0.00%	2.99	33.4%	-	0.00%	6,955,599	9.47%
2020	36,250,000	1,000,000	2.76%	50,972,801	2,103,375	4.13%	4.49	22.3%	9,443,638	18.53%	7,736,614	15.18%
2021	38,750,000	-	0.00%	47,004,975	-	0.00%	11.22	8.9%	-	0.00%	6,087,877	12.95%
2022	42,500,000	-	0.00%	46,161,519	-	0.00%	56.12	1.8%	-	0.00%	6,446,431	13.96%
Total	425,000,000	40,240,000	9.47%	746,106,731	53,475,875	7.17%			88,940,237	11.92%	102,370,686	13.72%
Total '12-18	262,500,000	39,240,000	14.95%	528,503,495	51,372,500	9.72%			79,496,599	15.04%	75,144,165	14.22%
											a priori LC	14.22%
											Selected	14.22%

(1)	provided	(7)	based on industry/internal data, client specific if credible
(2)	based on loss data provided	(8)	= 1 / (7)
(3)	= (2) / (1)	(9)	= (5) * (8)
(4)	calculated prior slide	(10)	= (9) / (4)
(5)	calculated slide	(11)	= (5) + (4) * (apriori) * (1-(8))
(6)	= (5) / (4)	(12)	= (11) / (4)

Experience Rating

Additional Considerations:

- General
  - What is the treatment of ALAE? (underlying and reinsurance)
  - Do any historical claims need to be stacked on top of each other?
  - What years should be included in final selection?
  - Are there any changes in the experience that cannot be fully quantified?
  - Are there any insights from a recent underwriting or claims audit?

- Line of business specific
  - Are any of the historical claims cat/shock losses that need to be removed?
  - Should claims be capped at policy limits?

Exposure Rating

What is Exposure Rating?

- Pure Exposure Rating
  - Used by primary companies (also called “Manual Rating”)
  - Rating agencies generally designate a “Basic Limit” size ($100K)
  - For higher limits, **Increased Limits Factors** determine the price

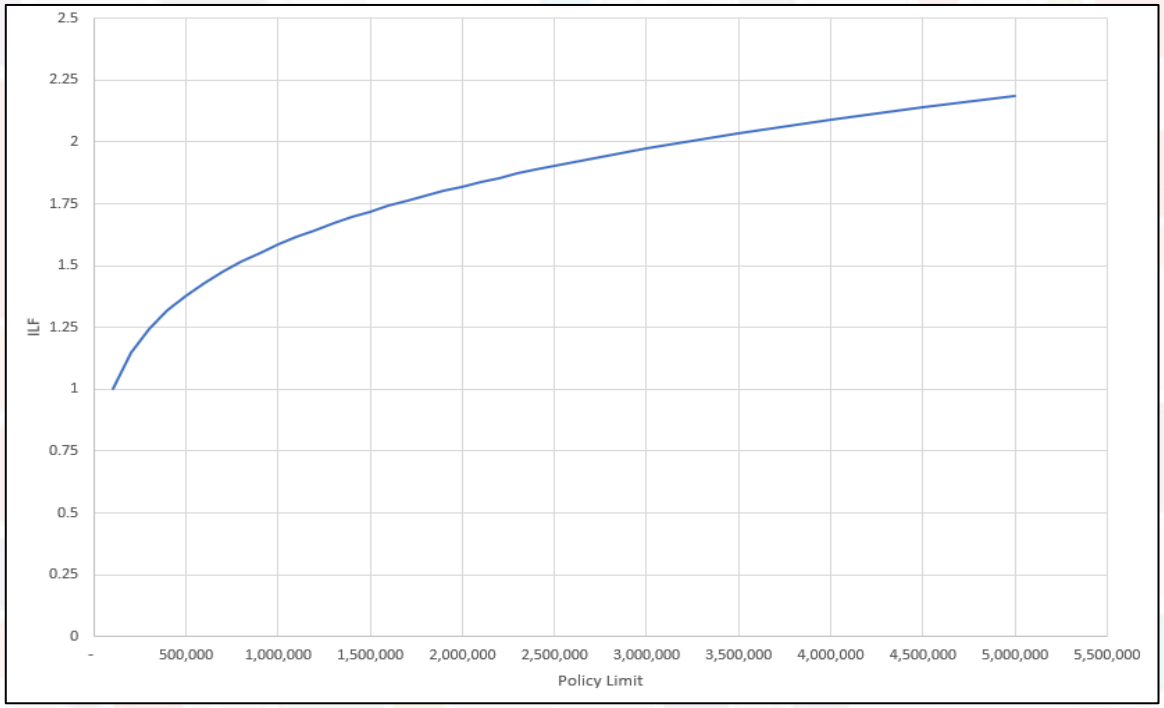
- ILF (L) = {Expected Severity (L) } / {Expected Severity (B)}
  - Assumes frequency is independent of claim severity

- Premium for higher limit L = (Base Rate) * (ILF(L)) * (Exposure)

Exposure Rating

ILF Properties

- ILF values should be monotonically increasing
- ILF curves should increase at a decreasing rate



Exposure Rating

Pure Exposure Rating (ILF)

- If base rate = $50, what rate will policyholder be charged for a limit of:
  - 100k?
  - 1M?
  - 5M?

Limit	ILF
100,000	1.0
250,000	1.4
500,000	1.7
1,000,000	2.0
2,000,000	2.3
5,000,000	2.5

- 100k = ($50)*(1.0) = $50
- 1M = ($50) *(2.0) = $100
- 5M = ($50)*(2.5) = $125

Exposure Rating

What is Exposure Rating for a reinsurer?

- Allocation of premium/loss to various layer bands through use of some generated curve/equation (i.e. severity distribution)
  - Based on industry data
  - Based on company data

- Calculate the portion of the direct policy premium exposed to a reinsurance layer, then calculate expected loss to the layer
  - Can be applied to each individual policy or to an aggregated risk profile

Policy Layer Premium = (Base Premium)*(Top ILF – Bottom ILF)

Expected Layer Loss = (Policy Layer Premium)*(Expected Loss Ratio)

Exposure Rating

Data needed for Exposure Rating:

- Company Specific
  - Limit/Deductible/Attachment Profiles
    (individual policy listing preferred)
  - Premium
  - Ground-up Loss Ratio
  - ALAE to total loss ratio

- Other Data
  - Loss curve / Increased Limit Factors

- Liability data should be split by line of business and by state
- WC data should include hazard class, state info
- Property data will need to provide occupancy data

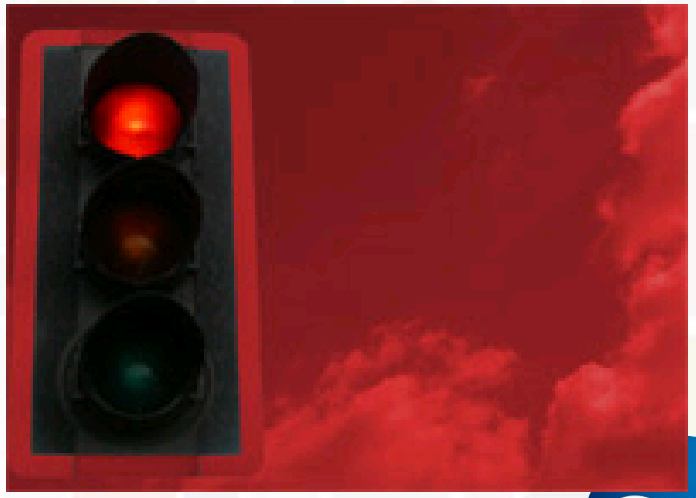
Exposure Rating

When do we exposure rate:

- When company experience is
  - Approximately comparable to industry
  - Insufficient
    - Low volume or new line of business
  - Not-credible
    - Mix changes
    - Changing profiles

When don't we exposure rate:

- When company experience is not comparable to industry
- Needed information is not available
  - Company doesn't provide the necessary info
  - No industry data is available



Exposure Rating

Property vs. Liability:

- The actual mechanics of exposure rating may differ by line of business, but the ideas behind it don't change
  - Liability uses Increased Limits Factors (ILFs)
  - Workers' Comp uses Excess Loss Factors (ELFs)
  - Property uses Size of Loss Curves (PSOLD)

- For liability we think in terms of dollars
  - A slip and fall costs $5,000

- For property we think in terms of % of Total Insured Value (TIV)
  - A HO claim is for 20% of the TIV

Exposure Rating

Example – Umbrella Portfolio

- The cedent is requesting quotes for a **5M XS 5M** layer
- Assume as given:
  - Projected Premium = **$50M** (earned for LOD treaty)
  - Projected Loss Ratio = **60%**
    - Assume “Loss” includes Loss & ALAE
  - Assume ALAE contained within policy limit for simplicity
  - Increased Limit Factors (ILF) utilized are based on relevant mix of Premises/Operations (GL), Products (GL), and Commercial Auto (AL)
  - Umbrella policies written over cedent’s own underlying General Liability (GL) and Auto Liability (Auto) policies – “Supported”
    - However, intention is for reinsurance to assume Umbrella “Unsupported”

Exposure Rating

Example – Umbrella Portfolio

- Calculating E(Loss) to the 5x5 for one policy group:

Original Policy Groups

LOB	100% Lim	Copart	Attach	Premium
(1)	(2)	(3)	(4)	(5)
Umbrella	10,000	100%	1,000	14,143

Limit	ILF
500	0.828
1,000	1.000
2,000	1.163
3,000	1.248
4,000	1.304
5,000	1.346
6,000	1.378
7,000	1.404
7,500	1.415
8,000	1.426
8,500	1.435
9,000	1.444
10,000	1.460
11,000	1.475
12,000	1.488

11M

6M

Values in 000s.

Key Formulas

$$ILF\ RI/Pol = ILF\ Top - ILF\ Bottom$$

$$ILF\ Final = \frac{ILF\ RI}{ILF\ Policy}$$

$$Reins.\ (RI)\ Layer\ Loss = ILF\ Final * GU\ Loss$$

Exposure Rating

Example – Umbrella Portfolio

- Calculating E(Loss) to the 5x5 for one policy group:

Original Policy Groups					Reinsurance Layer Calcs										
LOB	100% Lim	Copart	Attach	Premium	GULR	GU Loss	RI Top	RI Bot	Pol Top	Pol Bot	ILF RI	ILF Pol	ILF Fin	RI Loss
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Umbrella	10,000	100%	1,000	14,143	60%	8,486	11,000	6,000	11,000	1,000	0.097	0.475	0.204	1,735

11M

6M

Limit	ILF	
500	0.828	
1,000	1.000	Pol Bottom
2,000	1.163	
3,000	1.248	
4,000	1.304	
5,000	1.346	
6,000	1.378	Reins. Bot
7,000	1.404	
7,500	1.415	
8,000	1.426	
8,500	1.435	
9,000	1.444	
10,000	1.460	
11,000	1.475	RI & Pol Top
12,000	1.488	

ILF Reins. = 1.475 – 1.378 = .097

ILF Policy = 1.475 – 1.000 = .475

ILF Final = .097 / .475 = .204

GU Loss = 14.14M * 60% = $8.5M

Reinsurance Layer Loss
= 8.5M * .204 = **$1.7M**

Values in 000s.

Exposure Rating

Example – Umbrella Portfolio

- Aggregating E(Loss) to 5x5 across entire portfolio:

Original Policy Groups					Reinsurance Layer Calcs:									
LOB	100% Lim	Copart	Attach	Premium	GULR	GU Loss	RI Top	RI Bot	Pol Top	Pol Bot	ILF RI	ILF Pol	ILF Fin	RI Loss
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Umbrella	1,000	100%	1,000	6,068	60%	3,641	2,000	2,000	2,000	1,000	0	0.163	0	0
Umbrella	2,000	100%	1,000	9,244	60%	5,547	3,000	3,000	3,000	1,000	0	0.248	0	0
Umbrella	5,000	100%	1,000	14,063	60%	8,438	6,000	6,000	6,000	1,000	0	0.378	0	0
Umbrella	7,500	100%	1,000	6,482	60%	3,889	8,500	6,000	8,500	1,000	0.058	0.435	0.132	514
Umbrella	10,000	100%	1,000	14,143	60%	8,486	11,000	6,000	11,000	1,000	0.097	0.475	0.204	1,735
				50,000	**60%**	**30,000**						5x5 Loss		**2,249**
												5x5 Loss Rate		**4.50%**

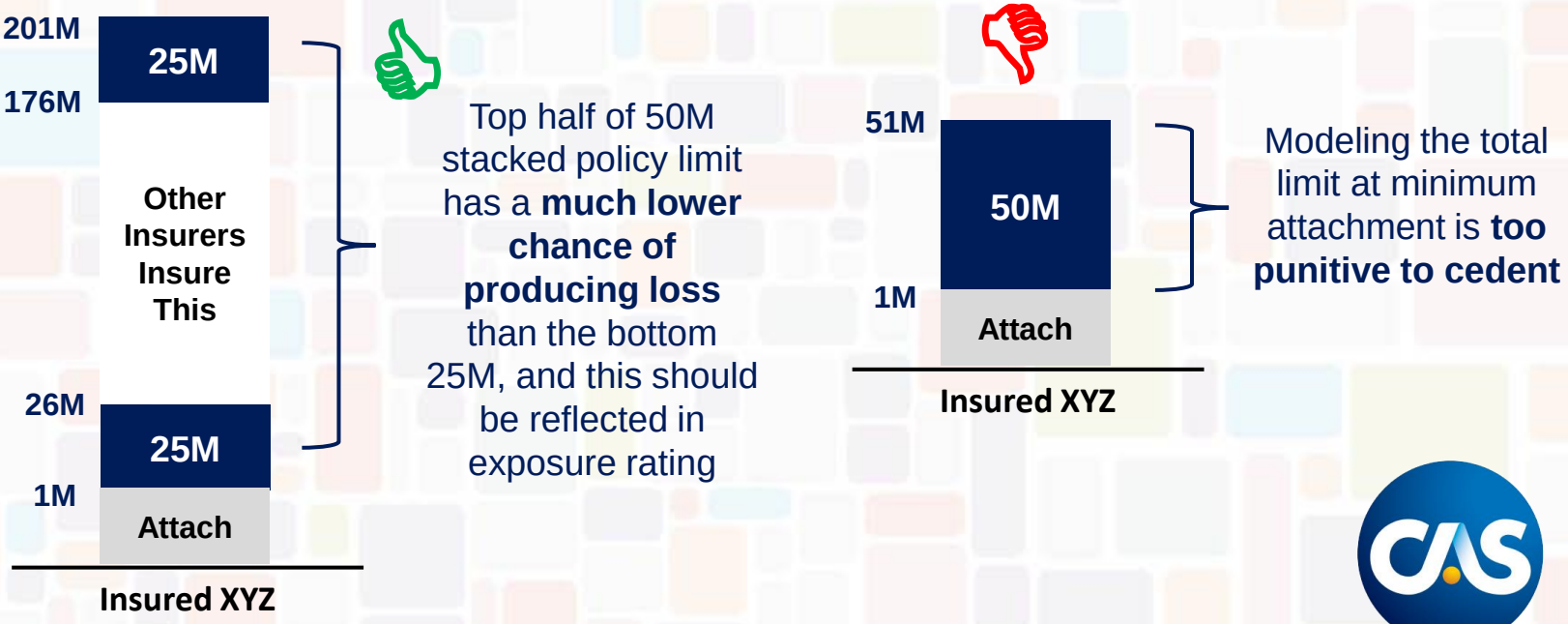
- Of the $30M of ground-up expected loss we expect for this portfolio, $2.25M allocates into the 5x5 layer according to the selected Increased Limit Factors
- About 60% of the portfolio (by premium) does not have limits that expose the 5x5, and therefore would not cede any loss to the layer (how does this compare to the past?)
- The exposure loss cost ratio is significantly lower than experience, which could be driven by the reducing portfolio limit composition (i.e. ↓ experience credibility)

Values in 000s.

Exposure Rating

Additional Considerations:

- Underlying policy deductibles/SIR
- Excess/umbrella policy attachment point
- ALAE treatment (both for underlying and reinsurance)
- Are there any stacked and ventilated policies?



Selected Layer Loss

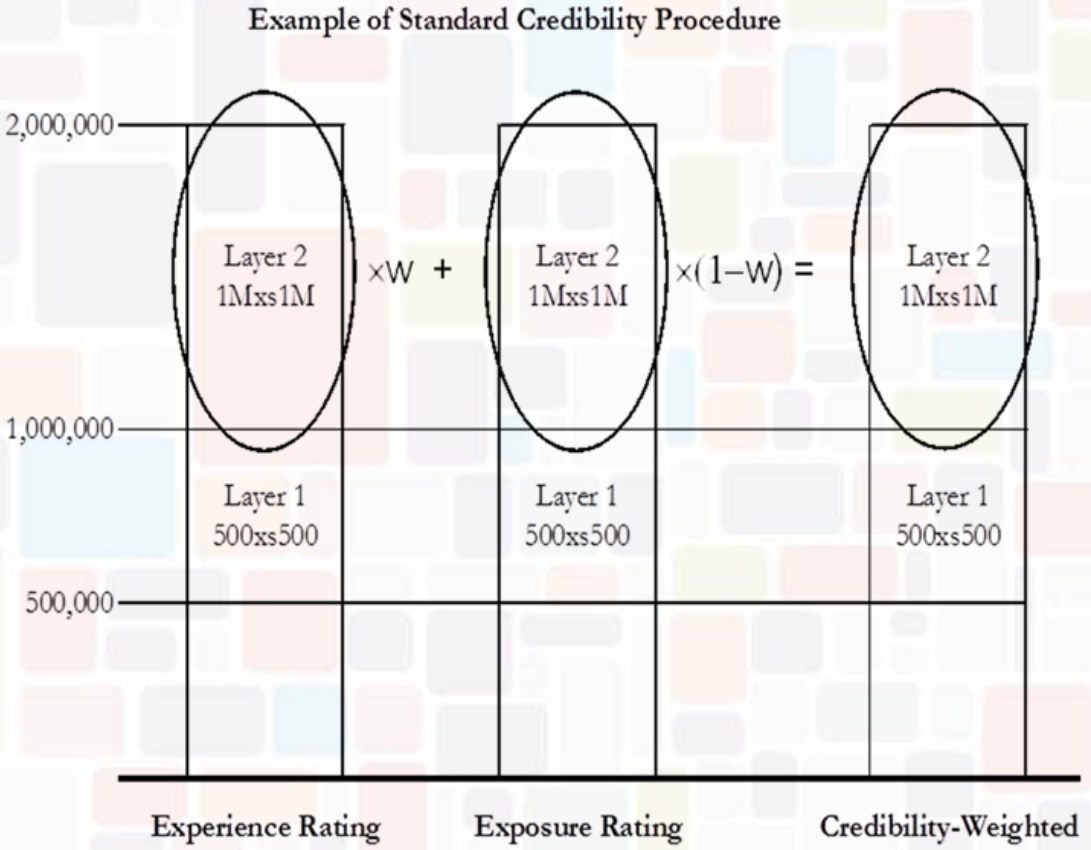
Credibility

- Final loss cost = [experience loss cost] x (credibility) + [exposure loss cost] x (1 – credibility)

- Experience credibility can have a technical basis, but is often judgmentally considered due to a variety of factors
- Factors that increase (decrease) credibility:
  - Large # of claims expected (small # of claims expected)
  - Low (high) retention and stability (volatility) of historical loss costs
  - Consistency in mix of business / policy terms written across history (changing mix of business / policy terms)
  - Data is high quality and reliable (data introduces questions & concerns)
  - Availability of data-specific assumptions (reliance on industry assumptions)
- Final selections can be based on more than just two methods if warranted (see next slide)

Selected Layer Loss

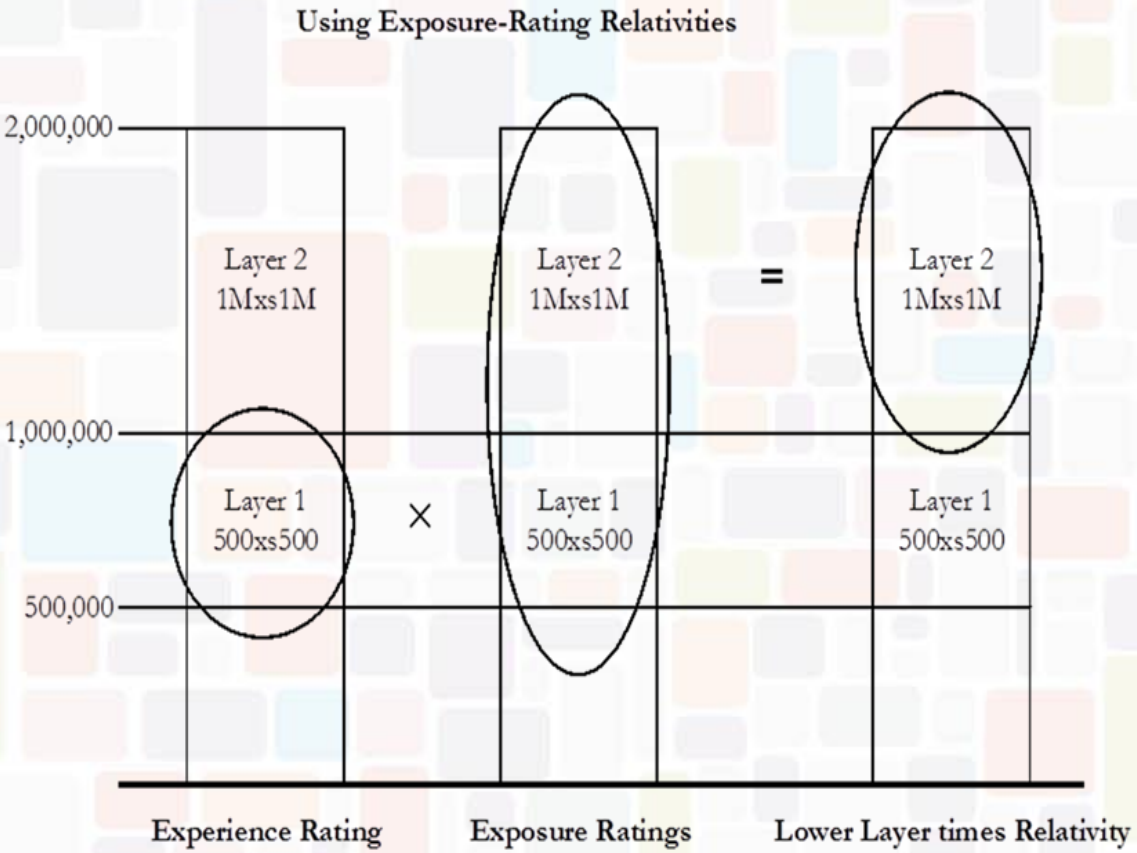
Credibility



- **Standard approach** calculates a selected point estimate using a credibility weighting of experience and exposure rating for the same reinsurance layer
- **"Free cover" issue** – need to capture all potential loss from currently modeled in-force policy profile

Selected Layer Loss

Credibility



Alternative approach considers a more credible lower layer (e.g. 500x500) experience rate and extrapolates into a higher layer (e.g. 1x1) using the exposure rating relativities across those two layers. This method allows consideration to experience when there are no or minimal losses to a higher layer

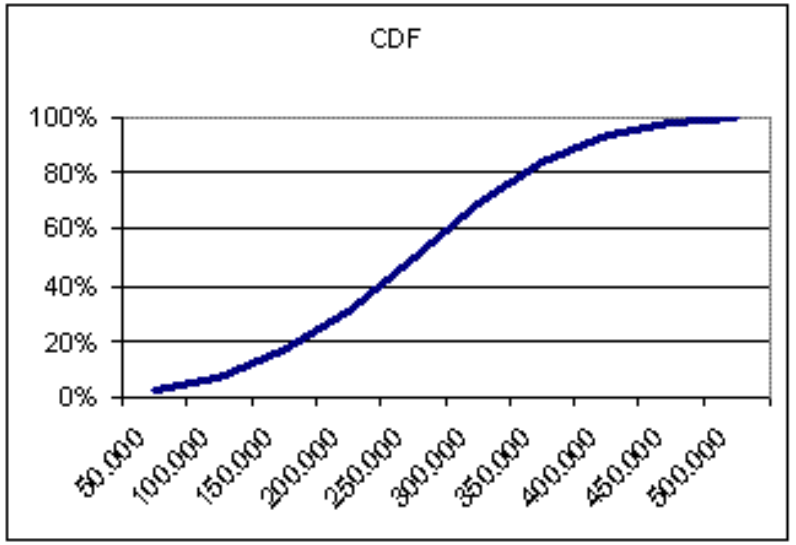
Simulated Loss Distribution

Volatility around selected mean losses

- After all that fancy work, your selection will be wrong ☹
- BUT the distribution around those selections could be useful!

Applications

- Assess upside & downside around selected point estimate
- Price reinsurance contracts
  - Standard deviation risk load
  - Function of tail proxy capital
- Price reinsurance features
  - Reinstatements
  - Loss Corridor
  - Annual Aggregate Deductible
  - Profit Commission



Thank you for your time!

Any Questions?