CAS/CARe Seminar

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INT-2: Intermediate/Advanced

Exposure and Experience Rating – Next Steps

THE SCIENCE OF **RISK**SM

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INT-2: Intermediate / Advanced Agenda

A. Benchmarking

- Pigeonholing What Actuaries Do
- Actuarial Utopia – Benchmark Assessment Matrix

B. Excess Casualty Trends

- Frequency and Severity Trends
- Numerator / Denominator Issue – Interplay with Rate changes

C. Stratified Rate Changes

- Impact of Premium Size

D. Excess Development Factors

- Variations by attachment points, etc.

E. Excess Loss Factors

- Rolling up Exposure and Experience Results

F. Bringing it All Together

- Emergence Testing – Impact on Reserving
- Underwriting Cycle

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A. Benchmarking

Benchmark Assessment Matrix
A Suggested Framework

- All information received can be slotted ("pigeonholed") for further analysis
- Set up an initial matrix of lines of business and types of analyses of interest to a primary company or reinsurer
  - US some 30 LOBs and 20 types of analyses
  - Trends, LDFs, ILFs, …, cycle analysis
  - Similar for Global

- Visual framework to systematically:
  - Survey and slot internal and external info into each cell
  - Assess confidence of each item in each cell
  - Establish priorities for pricing projects – direct and proxy
- Ultimately chief actuaries and upper management use all information to assess market cycles for each LOB
- Framework for slotting actuarial presentations, including today's

Pigeonholing:
Putting What Actuaries Do in a Box

Perspectives From America: By John Buchanan – May 2012

Benchmark Assessment Matrix
Estimating Confidences - Illustrative

	1	2	3	4	5	6	7
	Trends						
	Ground Up			Excess		Loss Dev't Factors	
	Severity	Freq	Exposure	Severity	Freq	Ground Up	Excess
Property	●	⊙	●	⊙	⊙	●	●
Casualty	●	⊙	○	⊙	⊙	●	●
Specialty	●	⊙	○	⊙	⊙	⊙	⊙

	8	9	10	11	12	13	14	15
	Rate Changes		Ground-Up	Excess Loss		State/ Hazard/	Layer Experience/	Emergence
	Primary	Reinsurance	Loss Costs	Factors	ALAE	Subline	Exposure	Testing
Property	●	●	●	●	●	●	●	●
Casualty	●	●	●	●	●	●	●	⊙
Specialty	⊙	⊙	●	⊙	●	⊙	⊙	⊙

	16	17	18	19	20	21	22	23
		Loss Ratios				Industry	LOB	Where
	External Forces	Primary	Reinsurers	Volatility	Aggregate Distribution	Macro Application	Redund/Def/ Correlations	in the Cycle?
Property	●	●	⊙	⊙	⊙	●	⊙	●
Casualty	●	●	⊙	⊙	⊙	⊙	⊙	⊙
Specialty	●	●	⊙	⊙	⊙	⊙	⊙	⊙

Confidence	Good	Medium	Some	Minimal
	●	⊙	⊙	○

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B. Excess Casualty Trends

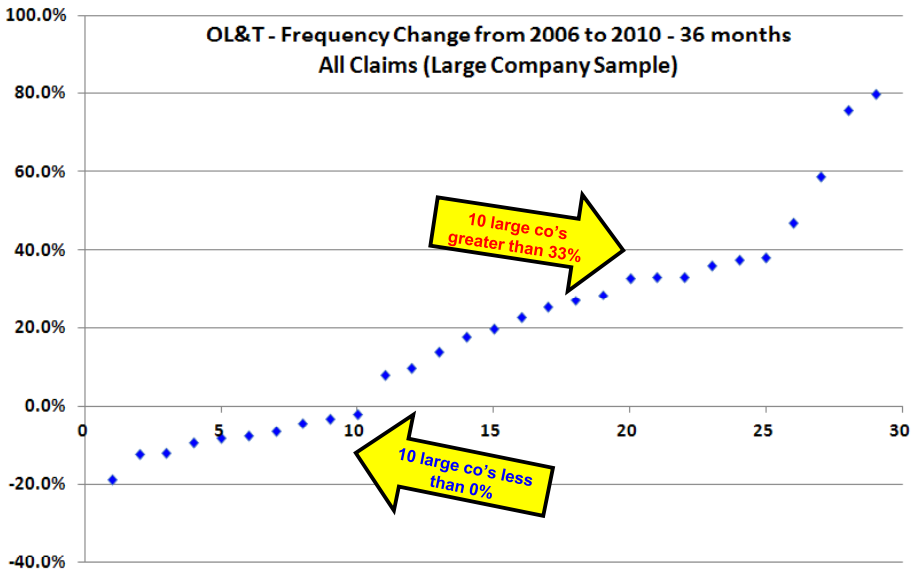
Frequency Trends: Which way are they going?

A spotlight has been shone on claim frequency changes over the last dozen years. This session will use the new ISO size-of-loss and concomitant rate-change data sources to survey the level of frequency and related severity and loss ratio changes in various lines of business under various sets of assumptions. This session will include investigating the impact of differences in nuisance claims and large claims by size-of-loss, and assess the qualitative impact of various claim frequency drivers.

Frequency Trends: Which way are they going?

- **Importance of getting it right**
  - The two major company killers: US Liability and US Catastrophe exposure
  - An accumulation of many years of getting it wrong is an avalanche of red ink, or worse
  - Role of benchmarks
- **Investigating frequency trends by size-of-loss**
  - Company variations
  - Data sources
  - Overview and difficulty in assessing – numerator vs. denominator issue
  - Sample ground-up vs. excess frequency calculations – new source
    - Using new raw losses, claim counts, and earned premium triangles
    - Using on-level rate factors, premium size and new vs. renewal, and detrended excess thresholds
  - Other sources: Comparing incoming case loads to large settled verdicts and settlements
- **Assessing frequency trend impact components**
  - Frequency trend assessment matrix
  - Two sample impact analyses
    - Personal Auto
    - MPL
  - Emerging issues

Frequency Trend: Company Dispersion



Average increase in Frequency (# ground-up claims per reported Earned Premium – not on-level) from 2006 to 2010 for this group is 24.0%

Comparison of ISO Sources

Excess Development, Trend, Rate Changes

	Excess Layer Loss Development Manuals	Size-of-Loss Matrix	Size-of-Loss Utility	MarketWatch Unleashed
Release	First released 1998; every other year since	First released Fall 2012; Second release Summer 2013; Third release Summer 2014	First release expected Summer 2014	First release 2000; released every quarter; MW Unleashed first released 2nd Qtr 2012
Type of Data	Aggregated loss and claim count triangles - 20 years	Aggregated loss and claim count triangles, associated premiums and on-level factors	Individual claims/ histories (masked), associated aggregated premiums and on-level factors	Individual policy renewals with final charged pricing, matching footprints; by state and subline
Lines / Classes of Business Covered	GL (PremOps, Prods), CAu (StGrp), MPL (PS, HPL; CM, Occ)	GL (7 sublines, total), CAu (3 sublines, total)	same as SOLM	GL, CAu, CP, BOP
Accident Years	Last 20 years	Last 16 years	same as SOLM	PY's 1996-2013
# of Companies	550	600	same as SOLM	Drawn from 1800 insurers
Volume (untrended): Ground-Up >100k >1M	GL, CAu, MPL 147.2B (#=13.5M) 60.2B (#=910K) * 5.1B (#=16.5K) *	GL, CAu 114.3B (#=7.3M) 48.0B (#=145.2K) 8.0B (#=4.0K)	GL, CAu same as SOLM same as SOLM same as SOLM	Drawn from over 16B records same source as SOLM
Types of Analyses	Layer Loss Development Factors - Incurred, Paid	Layer Loss Development Factors - Incurred	Layer Loss Development Factors - Incurred, Paid	Aggregated Rate Monitor Factors
	Ground-up and Excess Severity Trends	Ground-up and Excess Frequency and Severity Trends	Ground-up and Excess Frequency and Severity Trends	Rate Monitor Factors by Size-of-Premium
		Line/class profitability	AY vs. RY	Used to on-level actual premiums in SOLM and SOLU
			Claim dispersions	Rate Dispersions
			Company differentials - size, speed	Line of business correlation
			Excess percentile distributions	Primary Company Benchmarking Option

* XSLDM # claim volume is >= threshold shown

SOLM: Subclasses, Volumes, and Information Available

Major Class	Line of Business	Market	Total # of Claims
1	General Liability	Owners, Landlords, and Tenants	1,481,044
2	General Liability	Contractors	724,926
3	General Liability	Manufacturers	235,151
5	General Liability	Products	138,747
11	General Liability	Errors and Omissions	211,379
13	General Liability	Local Products	62,786
14	General Liability	Completed Operations	199,853
GL			3,053,886
10	Commercial Automobile	Trucks Tractors and Trailers	3,389,468
20	Commercial Automobile	Private Passenger Types	756,034
70	Commercial Automobile	Trucks Tractors and Trailers-Zone Rated	102,700
AL			4,248,202
GL&AL			7,302,088

Loss Types Available

Incurred Indemnity
Incurred ALAE
Occurrence Count
Incurred Indemnity & ALAE
Severity (Indemnity/count)
Severity ((Indemnity+ALAE)/count)

Premium Info Available

Earned Premium Triangles by Market
MarketWatch Aggregate Price Monitors (Policy Year)

Size-of-Loss Matrix: Sample Exhibit

GL Subline 1

Distribution of losses at 39 month maturity

SIZE OF LOSS RANGE	STATISTIC	ACCIDENT YEAR 1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
0-0	INCURRED INDEMNITY	0	0	0	0	0	0	0	0	0	0	0	0
0-0	INCURRED ALAE	13,599,439	14,158,465	12,414,728	8,791,334	11,037,136	8,023,261	6,547,579	5,076,017	6,075,653	5,356,090	4,923,851	5,369,093
0-0	OCCURENCE COUNT	4,768	3,747	3,311	2,401	2,210	1,606	1,528	1,371	1,335	1,114	1,232	1,252
1-100	INCURRED INDEMNITY	66,507	63,835	56,970	46,597	33,673	24,798	21,410	16,465	14,138	11,914	12,217	11,498
1-100	INCURRED ALAE	1,467,737	1,198,849	523,916	1,198,414	313,721	633,757	115,203	1,313,583	764,478	574,781	1,125,642	1,762,505
1-100	OCCURENCE COUNT	1,239	1,128	1,039	850	654	508	420	324	302	241	239	222
5001-10000	INCURRED INDEMNITY	15,974,875	15,713,670	15,011,338	11,764,726	10,455,496	8,860,116	7,682,813	7,348,043	7,277,050	6,950,938	7,393,069	6,691,362
5001-10000	INCURRED ALAE	4,789,623	4,063,309	3,710,736	3,226,484	2,644,978	2,330,274	1,976,995	2,098,134	2,063,173	1,693,002	1,721,988	1,278,192
5001-10000	OCCURENCE COUNT	2,081	2,061	1,972	1,564	1,387	1,168	1,021	980	963	935	976	893
10001-25000	INCURRED INDEMNITY	30,779,863	31,692,836	30,170,836	23,567,139	21,077,007	17,090,694	15,505,714	15,140,991	12,621,825	13,596,886	13,823,634	13,118,620
10001-25000	INCURRED ALAE	7,763,591	13,959,823	7,299,818	6,179,151	5,383,201	4,498,981	4,022,560	4,153,983	3,428,923	3,802,923	3,938,490	3,120,559
10001-25000	OCCURENCE COUNT	1,781	1,833	1,748	1,377	1,254	1,004	895	891	740	806	807	769
25001-50000	INCURRED INDEMNITY	33,754,277	34,322,870	34,299,041	26,202,898	22,236,604	19,413,193	19,754,037	17,340,592	15,777,674	16,543,418	15,508,850	15,185,790
25001-50000	INCURRED ALAE	7,856,317	8,299,210	6,852,323	5,740,062	5,074,411	6,228,246	4,803,747	3,906,266	4,260,656	4,119,995	3,208,286	3,532,573
25001-50000	OCCURENCE COUNT	885	904	891	711	601	507	522	464	416	436	409	405
50001-100000	INCURRED INDEMNITY	38,244,077	39,108,844	42,476,479	32,364,620	27,450,038	27,974,064	23,593,009	25,298,980	24,703,981	20,104,905	21,646,911	21,002,152
50001-100000	INCURRED ALAE	7,298,334	8,150,441	6,790,922	6,438,844	5,524,548	6,909,154	4,705,091	6,301,545	4,453,345	3,613,932	6,168,463	4,129,669
50001-100000	OCCURENCE COUNT	506	519	562	435	362	371	314	332	331	273	286	278
100001-250000	INCURRED INDEMNITY	47,620,222	50,030,641	54,116,170	42,298,192	35,032,281	37,401,777	32,357,081	35,761,489	30,114,004	29,307,715	36,557,085	29,182,200
100001-250000	INCURRED ALAE	8,241,131	9,952,714	8,020,849	6,412,332	6,104,697	9,191,973	5,411,382	7,666,665	5,229,612	4,355,517	5,965,216	5,395,627
100001-250000	OCCURENCE COUNT	292	314	336	265	212	224	199	214	183	175	220	181
250001-500000	INCURRED INDEMNITY	44,266,748	46,643,277	40,354,874	38,504,019	31,740,584	34,694,423	28,371,650	26,136,233	26,554,976	29,580,238	27,795,072	24,589,379
250001-500000	INCURRED ALAE	6,375,440	6,921,522	4,569,491	5,366,274	6,171,096	5,044,736	5,590,589	2,438,613	3,024,513	4,054,341	3,903,097	3,478,120
250001-500000	OCCURENCE COUNT	121	125	109	104	86	93	76	71	70	80	76	65
500001-1000000	INCURRED INDEMNITY	55,847,358	57,937,742	57,888,577	53,635,885	43,389,281	38,817,189	42,475,804	50,056,769	31,610,534	32,704,720	47,810,336	34,472,022
500001-1000000	INCURRED ALAE	4,907,367	8,193,414	6,224,802	6,409,820	4,577,918	3,704,574	3,825,920	3,497,827	2,695,174	3,601,330	8,775,713	4,894,130
500001-1000000	OCCURENCE COUNT	69	68	71	67	52	49	50	60	40	40	59	41
>1000000	INCURRED INDEMNITY	17,055,135	10,303,726	9,452,502	17,385,921	7,915,396	6,852,310		7,691,451	15,081,532	6,720,005	7,684,356	3,129,176
>1000000	INCURRED ALAE	238,954	434,398	283,456	880,296	2,802,675	204,494		130,292	1,850,338	1,511,107	837,331	465,342
>1000000	OCCURENCE COUNT	9	6	5	11	5	5		6	8	6	6	3
1,478,916,571	**Total Indemnity**	**306,549,696**	**309,129,577**	**306,013,085**	**264,484,739**	**214,412,316**	**203,542,314**	**180,631,697**	**195,650,189**	**173,943,567**	**165,275,287**	**188,395,183**	**157,066,018**
330,831,702	**Total ALAE**	**68,126,331**	**80,306,611**	**61,341,379**	**53,859,461**	**52,258,682**	**49,259,223**	**39,429,574**	**39,928,490**	**36,038,372**	**34,504,967**	**43,897,691**	**35,514,703**
93,495	**Occurrence Count**	**28,118**	**27,207**	**25,630**	**20,763**	**17,127**	**13,576**	**11,687**	**11,305**	**10,453**	**9,711**	**10,037**	**9,599**
4,742,032,061	**EARNED PREMIUM**					**512,637,147**	**512,069,014**	**601,592,626**	**638,906,992**	**639,194,023**	**614,239,742**	**604,657,222**	**618,735,296**
38.2%	**To Date Ground-Up LR**					**52.0%**	**49.4%**	**36.6%**	**36.9%**	**32.9%**	**32.5%**	**38.4%**	**31.1%**
2001-2008													

SOLM: Triangle Utility – Select Raw Data

Development Triangle - User Defined Class of Business, Loss Ranges & Loss Types

Major Class	GL
Loss Range Min	5,001
Loss Range Max	>5,000,000
Loss Type	INCURRED INDEMNITY & ALAE

Line of Business: GL | Market: Combined

	12	24	36	48	60	72	84	96	108	120	132	144	156	168
AY 1997	944,399,848	1,954,905,954	2,733,063,786	3,248,442,726	3,264,936,173	3,407,948,127	3,529,820,863	3,583,016,028	3,595,174,799	3,615,082,487	3,647,818,662	3,656,267,755	3,660,045,834	3,658,686,056
AY 1998	985,476,534	2,021,431,419	2,907,798,298	3,017,812,139	3,295,050,142	3,495,556,032	3,590,119,179	3,619,673,954	3,650,732,017	3,682,658,339	3,715,219,117	3,731,767,798	3,743,822,969	3,750,678,465
AY 1999	1,089,860,042	2,191,181,583	2,458,869,137	2,975,316,975	3,350,127,113	3,492,560,276	3,545,254,311	3,623,166,879	3,684,599,877	3,733,320,279	3,750,953,393	3,762,386,436	3,779,927,087	3,789,659,265
AY 2000	1,162,930,711	2,359,780,568	3,232,104,804	3,922,929,684	4,217,478,612	4,324,692,051	4,403,607,003	4,497,251,209	4,546,466,996	4,570,100,365	4,589,006,872	4,593,410,667	4,591,132,721	
AY 2001	1,087,910,842	2,095,173,981	3,084,505,011	3,788,179,610	4,008,904,336	4,145,722,535	4,168,486,605	4,243,600,397	4,278,935,696	4,288,838,439	4,303,895,018	4,335,289,682		
AY 2002	898,337,977	1,868,398,433	2,806,007,620	3,453,880,162	3,637,629,520	3,757,448,193	3,830,611,788	3,842,967,649	3,900,834,985	3,918,429,554	3,920,613,123			
AY 2003	959,219,248	1,902,272,260	2,572,263,831	3,012,544,643	3,266,967,139	3,426,056,415	3,490,199,862	3,492,296,595	3,538,100,140	3,549,838,664				
AY 2004	1,201,002,667	2,206,404,136	2,885,214,417	3,373,603,694	3,528,757,451	3,596,044,479	3,612,513,738	3,642,914,780	3,657,974,195					
AY 2005	1,051,847,693	2,324,306,859	3,097,091,613	3,545,204,660	3,805,263,934	3,914,566,367	3,988,865,683	4,047,836,785						
AY 2006	1,226,852,554	2,306,136,511	3,102,450,649	3,602,461,881	3,846,991,108	4,002,175,930	4,053,672,943							
AY 2007	1,228,252,794	2,448,775,412	3,368,648,740	3,889,087,655	4,248,819,928	4,403,830,862								
AY 2008	1,163,705,596	2,341,910,141	3,220,841,222	3,777,242,207	4,160,156,810									
AY 2009	1,173,145,121	2,298,474,501	3,168,696,728	3,765,393,292										
AY 2010	1,250,513,018	2,387,991,754	3,216,559,013											
AY 2011	1,280,816,413	2,573,571,723												
AY 2012	1,093,153,349													
	54,048,844,151	58,576,013,270												

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108	132/120	144/132	156/144	168/156	180/168
AY 1997	2.070	1.398	1.189	1.005	1.044	1.036	1.015	1.003	1.006	1.009	1.002	1.001	1.000	1.002
AY 1998	2.051	1.438	1.038	1.092	1.061	1.027	1.008	1.009	1.009	1.009	1.004	1.003	1.002	1.000
AY 1999	2.011	1.122	1.210	1.126	1.043	1.015	1.022	1.017	1.013	1.005	1.003	1.005	1.003	
AY 2000	2.029	1.370	1.214	1.075	1.025	1.018	1.021	1.011	1.005	1.004	1.001	1.000		
AY 2001	1.926	1.472	1.228	1.058	1.034	1.005	1.018	1.008	1.002	1.004	1.007			
AY 2002	2.080	1.502	1.231	1.053	1.033	1.019	1.003	1.015	1.005	1.001				
AY 2003	1.983	1.352	1.171	1.084	1.049	1.019	1.001	1.013	1.003					
AY 2004	1.837	1.308	1.169	1.046	1.019	1.005	1.008	1.004						
AY 2005	2.210	1.332	1.145	1.073	1.029	1.019	1.015							
AY 2006	1.880	1.345	1.161	1.068	1.040	1.013								
AY 2007	1.994	1.376	1.154	1.092	1.036									
AY 2008	2.012	1.375	1.173	1.101										
AY 2009	1.959	1.379	1.188											
AY 2010	1.910	1.347												
AY 2011	2.009													

- Select Specific GL or CA Markets, All GL, All CA, GL and CA Combined
- Set a minimum and maximum loss range to analyze
- Choose either Indemnity, Indemnity + ALAE, ALAE Only, Occurrence Count, Severity (with and without ALAE)

SOLM: Triangle Utility - Assumptions

Select Loss Development Factors

Loss amounts yield a loss ratio calculation. Occurrence counts yield a frequency calculation

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156	156 - 168	168 - 180	180 ult
3-Yr ATA	1.960	1.367	1.172	1.088	1.035	1.012	1.008	1.011	1.003	1.003	1.004	1.002	1.001	1.001	1.000
3-Yr ATU	3.699	1.887	1.381	1.179	1.084	1.047	1.034	1.026	1.015	1.011	1.008	1.005	1.002	1.001	1.000
5-Yr ATA	1.977	1.364	1.194	1.077	1.035	1.015	1.009	1.010	1.006	1.004	1.004	1.002	1.001	1.001	1.000
5-Yr ATU	3.687	1.8[illegible]	1.367	1.174	1.090	1.054	1.038	1.029	1.018	1.012	1.008	1.004	1.002	1.001	1.000
All-Yr ATA	1.992	[illegible]	1.174	1.073	1.037	1.017	1.013	1.010	1.006	1.005	1.004	1.002	1.001	1.001	1.000
All-Yr ATU	3.762	1.888	1.385	1.180	1.100	1.061	1.043	1.029	1.019	1.013	1.008	1.004	1.002	1.001	1.000
Sel ATA	1.992	1.363	1.174	1.073	1.037	1.017	1.013	1.010	1.006	1.005	1.004	1.002	1.001	1.001	1.000
Sel ATU	3.762	1.888	1.385	1.180	1.100	1.061	1.043	1.029	1.019	1.013	1.008	1.004	1.002	1.001	1.000
% Reptd	26.6%	53.0%	72.2%	84.8%	90.9%	94.3%	96.9%	97.1%	98.1%	98.7%	99.2%	99.6%	99.8%	99.9%	100.0%
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	1999		
To Date	1,093,153,349	2,573,571,723	3,216,559,013	3,765,393,292	4,160,156,810	4,403,830,862	4,053,672,943	4,047,836,785	3,657,974,195	3,549,838,664	3,920,613,123	4,335,289,682	4,591,132,721	3,789,659,265	
Est Ult Unadjusted	4,112,371,77[illegible]	4,859,397,562	4,455,935,910	4,441,999,736	4,575,133,815	4,670,507,435	4,225,974,746	4,167,039,885	3,728,112,289	3,596,291,951	3,952,151,876	4,354,443,737	4,602,326,982	3,793,733,791	
Threshold Adj	[illegible]0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Est Ult Adj	4,112,[illegible],753	4,859,397,562	4,455,935,910	4,441,999,736	4,575,133,815	4,670,507,435	4,225,974,746	4,167,039,885	3,728,112,289	3,596,291,951	3,952,151,876	4,354,443,737	4,602,326,982	3,793,733,791	
Act Prem To Date	8,[illegible],270,752	8,854,981,632	8,643,993,251	8,933,073,236	9,537,798,653	10,182,371,047	10,165,926,108	9,924,157,928	9,812,783,176	9,096,405,227	7,203,566,271	6,511,489,209			
Ult Prem To Date	,019,285,924	8,850,366,919	8,643,706,452	8,933,203,284	9,537,690,748	10,182,371,047	10,165,926,108	9,924,157,928	9,812,783,176	9,096,405,227	7,203,566,271	6,511,489,209			
MW On-level Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
Sel On-level Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000			
On-level Ult Prem	9,019,285,924	8,850,366,919	8,643,706,[illegible]	8,933,203,284	9,537,690,748	10,182,371,047	10,165,926,108	9,924,157,928	[illegible]783,176	9,096,405,227	7,203,566,271	6,511,489,209			
Partial LR	0.456	0.549	0.516	0.497	0.480	0.459	0.416	0.420	[illegible]380	0.395	0.549	0.669			

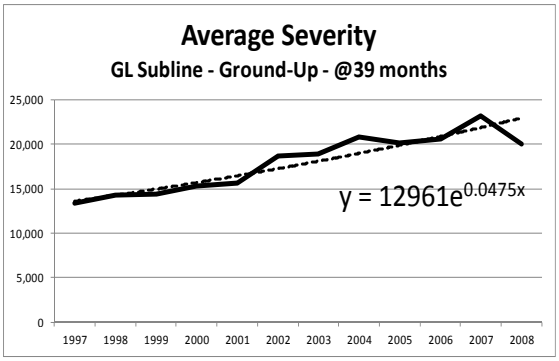
Choose a threshold adjustment to compensate for impact of severity trend on thresholds

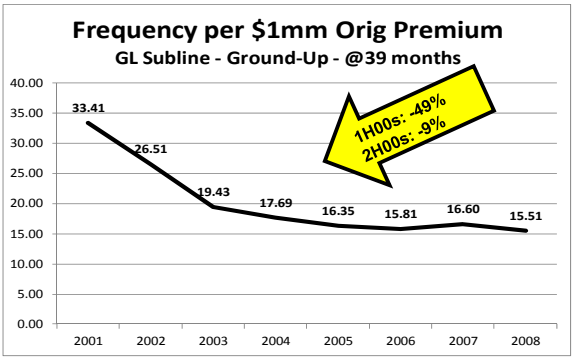
Select rate changes and new/renewal adjustments to on-level earned premium

Select premium development factors

Illustration of Excess Trend Issue
Ground-Up Severity and Frequency Trends - Unadjusted

GL Subline #1 (6.4%) - @39mo	2001	2002	2003	2004	2005	2006	2007	2008	2001-2008
Incurred Indemnity	214,412,316	203,542,314	180,631,697	195,650,189	173,943,567	165,275,287	188,395,183	157,066,018	**1,478,916,571**
Incurred ALAE	52,258,682	49,259,223	39,429,574	39,928,490	36,038,372	34,504,967	43,897,691	35,514,703	330,831,702
Occurrence Count	17,127	13,576	11,687	11,305	10,453	9,711	10,037	9,599	**93,495**
Earned Premium - Raw	512,637,147	512,069,014	601,592,626	638,906,992	639,194,023	614,239,742	604,657,222	618,735,296	**4,742,032,061**
Indicated LR - unadjusted	0.52	0.49	0.37	0.37	0.33	0.33	0.38	0.31	0.38
Frequency (per $1m orig prem) - unadj	**33.41**	**26.51**	**19.43**	**17.69**	**16.35**	**15.81**	**16.60**	**15.51**	19.72
Average Severity	**15,570**	**18,621**	**18,830**	**20,838**	**20,088**	**20,573**	**23,144**	**20,063**	19,357





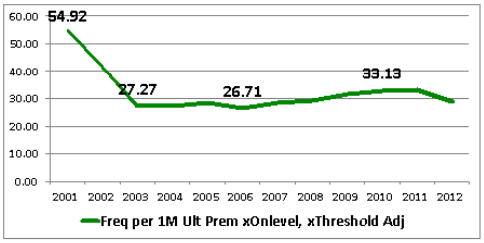
Frequency Trend Illustration: Ground-Up

Major Class	1
Loss Range Min	-
Loss Range Max	>5,000,000
Loss Type	OCCURENCE COUNT

Line of Business Market
GL Owners, Landlords, and Tenants

	12	24	36	48	60	72	84	96	108	120	132	144
AY 1997	121,646	138,822	148,640	153,512	155,900	156,367	156,606	156,827	156,724	156,770	156,779	156,858
AY 1998	109,205	128,191	134,389	137,961	138,640	139,303	139,340	139,276	139,370	139,440	139,447	139,459
AY 1999	108,692	127,646	134,264	136,700	137,628	137,823	137,662	137,807	137,887	138,021	138,060	138,075
AY 2000	102,438	117,683	123,109	124,932	125,609	125,641	125,835	125,932	126,055	126,118	126,122	126,150
AY 2001	88,097	98,728	102,468	104,372	104,808	105,200	105,338	105,415	105,449	105,482	105,550	105,553
AY 2002	75,165	81,551	85,353	86,891	87,558	87,759	87,844	87,883	87,937	87,979	88,027	
AY 2003	66,871	72,305	74,999	76,278	76,665	76,815	76,906	76,973	77,024	77,063		
AY 2004	66,805	70,474	72,649	73,768	74,116	74,240	74,303	74,347	74,397			
AY 2005	65,337	69,609	72,012	73,216	73,540	73,752	73,802	73,910				
AY 2006	60,809	64,393	66,775	67,808	68,345	68,455	68,660					
AY 2007	63,400	68,047	70,483	71,488	71,697	71,847						
AY 2008	62,776	68,302	69,788	71,012	71,381							
AY 2009	66,980	71,125	73,949	75,151								
AY 2010	70,777	76,190	78,714									
AY 2011	71,505	75,038										
AY 2012	60,712											
	1,412,054	1,481,044										

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
To Date	60,712	75,038	78,714	75,151	71,381	71,847	68,660	73,910	74,397	77,063	88,027	105,553
Est Ult Unadjusted	72,354	80,835	**81,259**	76,082	71,781	72,075	68,816	74,022	74,478	77,108	88,058	105,568
Threshold Adj*	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Est Ult Adj	**72,354**	**80,835**	**81,259**	**76,082**	**71,781**	**72,075**	**68,816**	**74,022**	**74,478**	**77,108**	**88,058**	**105,568**
Ult Prem xOnlevel, xTh	**28.88**	**33.17**	33.13	**31.59**	**29.30**	**28.50**	26.71	**28.74**	**27.31**	27.27	**41.71**	54.92
Act Prem To Date	2,487,653,726	2,438,458,728	2,453,349,638	2,408,750,112	2,450,106,856	2,528,948,066	2,576,347,033	2,575,358,759	2,727,363,173	2,827,778,257	2,111,297,604	1,922,282,412
Ult Prem To Date	2,504,942,623	2,436,971,815	**2,452,871,417**	2,408,586,531	2,450,084,746	2,528,948,066	**2,576,347,033**	2,575,358,759	2,727,363,173	**2,827,778,257**	2,111,297,604	**1,922,282,412**



Owners, Landlords, and Tenants
Loss Range Min: 0
Loss Range Max: >5,000,000
Total number of claims above threshold: 1,481,044

Owners, Landlords, and Tenants
Threshold: All Claims

Total Raw Indicated Frequency Change

-50.3%	2001-2003
-2.0%	2003-2006
24.0%	2006-2010

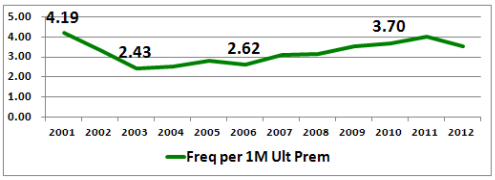
Excess Frequency Trend Illustration: 25k

Major Class	1
Loss Range Min	25,001
Loss Range Max	>5,000,000
Loss Type	OCCURENCE COUNT

GL Owners, Landlords, and Tenants

	12	24	36	48	60	72	84	96	108	120	132	144
AY 1997	3,759	6,806	8,566	9,166	9,274	9,202	9,200	9,178	9,169	9,173	9,170	9,174
AY 1998	3,320	6,310	7,973	8,557	8,562	8,635	8,500	8,476	8,445	8,457	8,454	8,463
AY 1999	3,538	6,757	8,394	8,873	9,039	8,877	8,825	8,760	8,745	8,764	8,761	8,765
AY 2000	3,540	6,596	8,338	8,974	8,962	8,872	8,780	8,751	8,756	8,756	8,756	8,760
AY 2001	3,354	6,206	7,680	8,302	8,289	8,152	8,096	8,059	8,049	8,036	8,038	8,050
AY 2002	2,995	5,447	6,886	7,373	7,287	7,216	7,146	7,102	7,088	7,080	7,077	
AY 2003	3,251	5,755	6,872	7,061	7,089	7,000	6,892	6,847	6,832	6,844		
AY 2004	3,466	5,925	6,717	7,108	7,024	6,892	6,856	6,832	6,831			
AY 2005	3,684	5,959	7,306	7,550	7,433	7,312	7,243	7,232				
AY 2006	3,440	5,877	6,749	6,967	6,877	6,788	6,762					
AY 2007	4,155	6,686	7,740	8,093	7,980	7,909						
AY 2008	3,975	6,523	7,550	7,904	7,828							
AY 2009	4,395	7,128	8,445	8,728								
AY 2010	4,671	7,658	8,827									
AY 2011	4,932	7,878										
AY 2012	4,132											
	114,922	123,305										

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	120 - 132	132 - 144	144 - 156
All-Yr ATA	1.727	1.205	1.055	0.997	0.989	0.992	0.996	0.999	1.000	1.000	1.001	1.001
All-Yr ATU	2.141	1.240	1.029	0.975	0.978	0.989	0.997	1.001	1.003	1.002	1.002	1.002
Sel ATA	1.727	1.205	1.055	0.997	0.989	0.992	0.996	0.999	1.000	1.000	1.001	1.001
Sel ATU	2.141	1.240	1.029	0.975	0.978	0.989	0.997	1.001	1.003	1.002	1.002	1.002
% Reptd	46.7%	80.6%	97.2%	102.5%	102.2%	101.1%	100.3%	99.9%	99.7%	99.8%	99.8%	99.8%
	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001
To Date	4,132	7,878	8,827	8,728	7,828	7,909	6,762	7,232	6,831	6,844	7,077	8,050
Est Ult Unadjusted	8,846	9,769	9,080	8,512	7,657	7,821	6,742	7,241	6,850	6,859	7,094	8,064
Threshold Adj*	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Est Ult Adj	8,846	9,769	9,080	8,512	7,657	7,821	6,742	7,241	6,850	6,859	7,094	8,064
Freq per 1M Ult Prem	3.53	4.01	3.70	3.53	3.13	3.09	2.62	2.81	2.51	2.43	3.36	4.19
Act Prem To Date	2,487,653,726	2,438,458,728	2,453,349,638	2,408,750,112	2,450,106,856	2,528,948,066	2,576,347,033	2,575,358,759	2,727,363,173	2,827,778,257	2,111,297,604	1,922,282,412
Ult Prem To Date	2,504,942,623	2,436,971,815	2,452,871,417	2,408,586,531	2,450,084,746	2,528,948,066	2,576,347,033	2,575,358,759	2,727,363,173	2,827,778,257	2,111,297,604	1,922,282,412

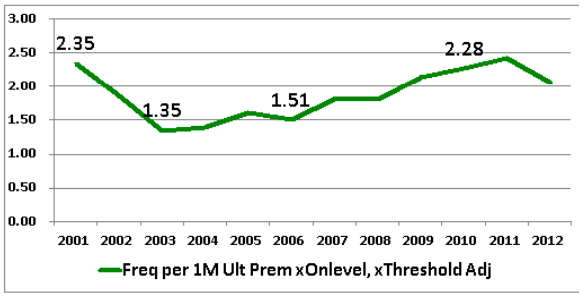


Owners, Landlords, and Tenants
Threshold: 25,001

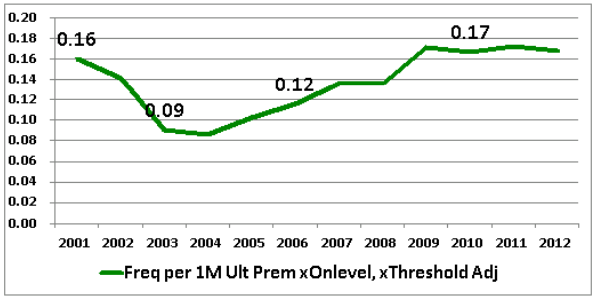
Total Raw Indicated Frequency Change

-42.2%	2001-2003
7.9%	2003-2006
41.5%	2006-2010

Average Excess Frequencies: 50k, 500k
Not Adjusted for Rate Changes or Impact of Threshold



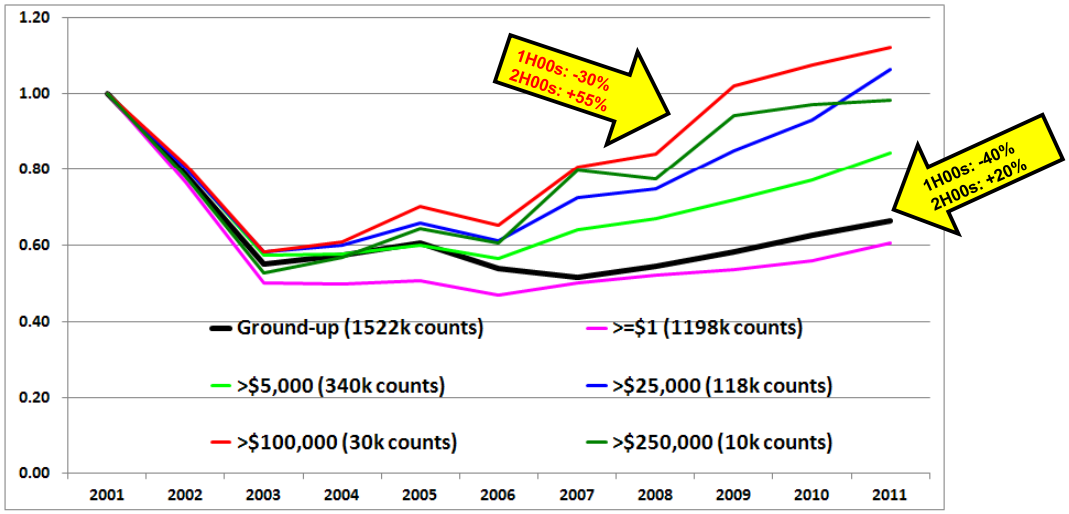
Owners, Landlords, and Tenants
Loss Range Min: 50,001
Loss Range Max: >5,000,000
Total number of claims above threshold: 68,049



Owners, Landlords, and Tenants
Loss Range Min: 500,001
Loss Range Max: >5,000,000
Total number of claims above threshold: 4,374

Various Excess Frequency Analyses

Sample Ground-up and Excess Frequencies – Unadjusted

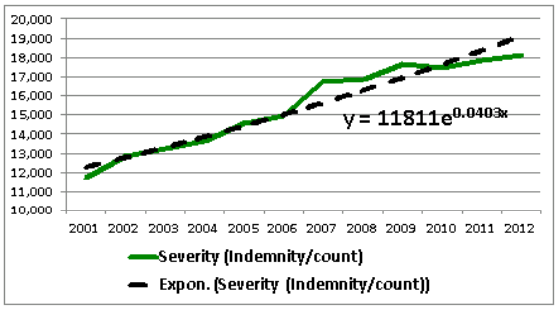


Source: ISO Size of Loss Matrix (OL&T - 550 companies - $22.2B)
Using all-year volume weighted averages and no development beyond 120 months

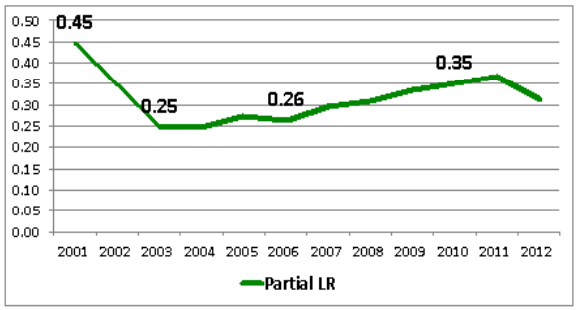
NB: Frequency per $1M SP relativities do NOT include adjustment for premium on-leveling, or the effect of severity trend on claims near the threshold

Illustrative Usage of SOLM Data

Average Ground-Up Severity and Partial Loss Ratios



Owners, Landlords, and Tenants
Threshold: All Claims



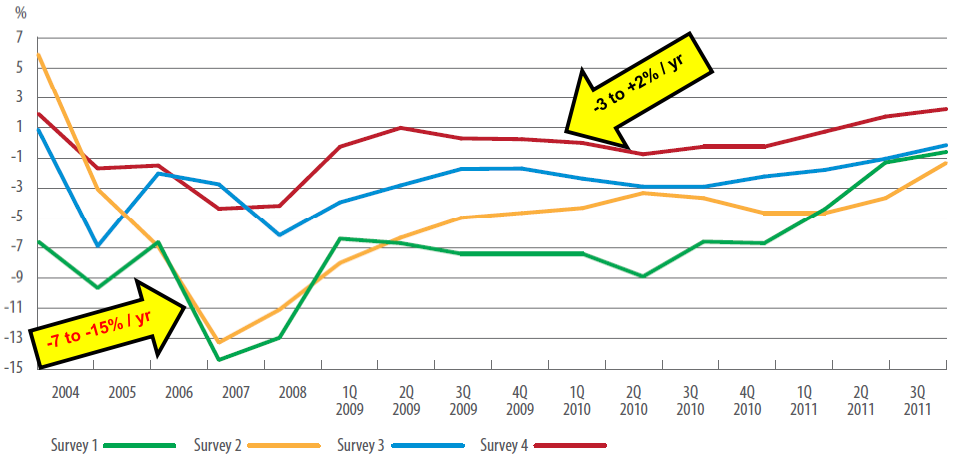
Owners, Landlords, and Tenants
Loss Range Min 0
Loss Range Max 100,000

C. Stratified Rate Changes

Interplay of Loss/Premium Based Frequencies and Rate Changes
Rate Change Variation Survey

Figure 1

Survey of Surveys: Commercial Lines Rate Changes

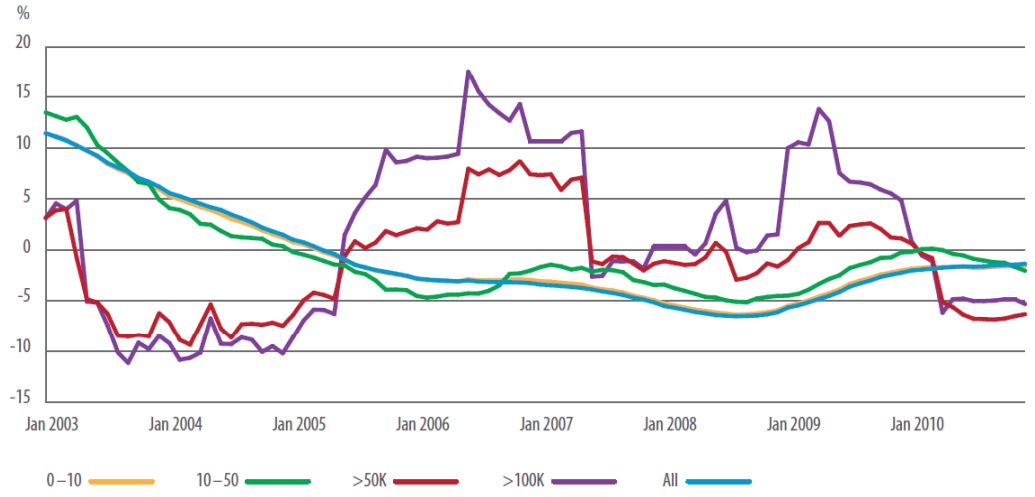


Source: Verisk Review – Staying ahead of the Pricing Roller Coaster
John Buchanan and Joe Izzo – Fall 2012

Illustrative Rate Changes
Dispersion by Premium Size – Sample 1

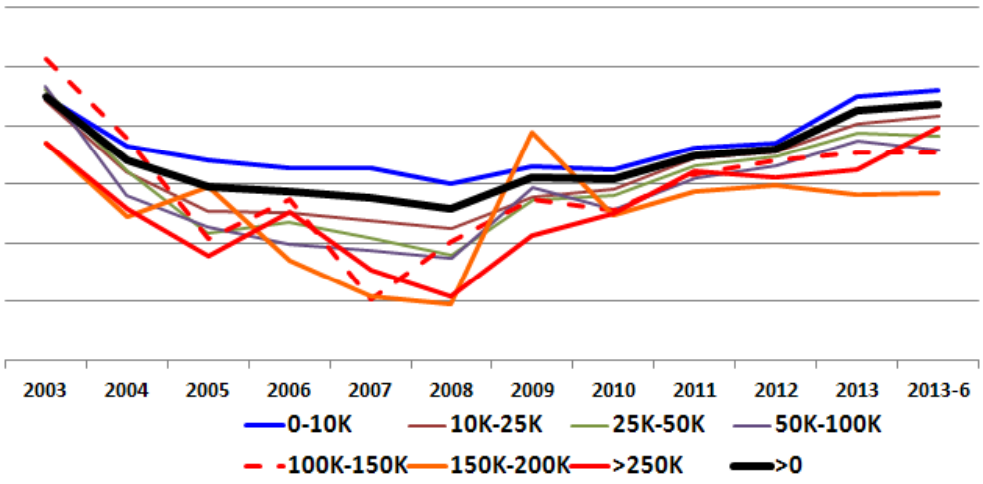
Figure 2

Sample Actual Rate Changes: Impact of Premium Sizes



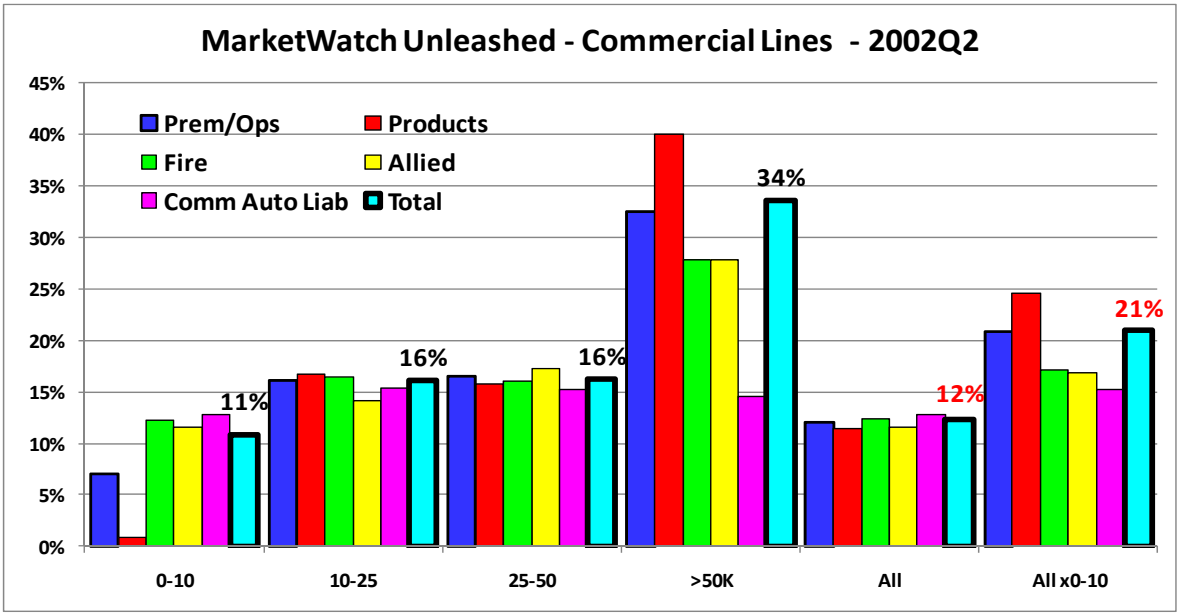
Source: ISO MarketWatch® Unleashed

Illustrative Rate Changes
Dispersion by Premium Size – Sample 2

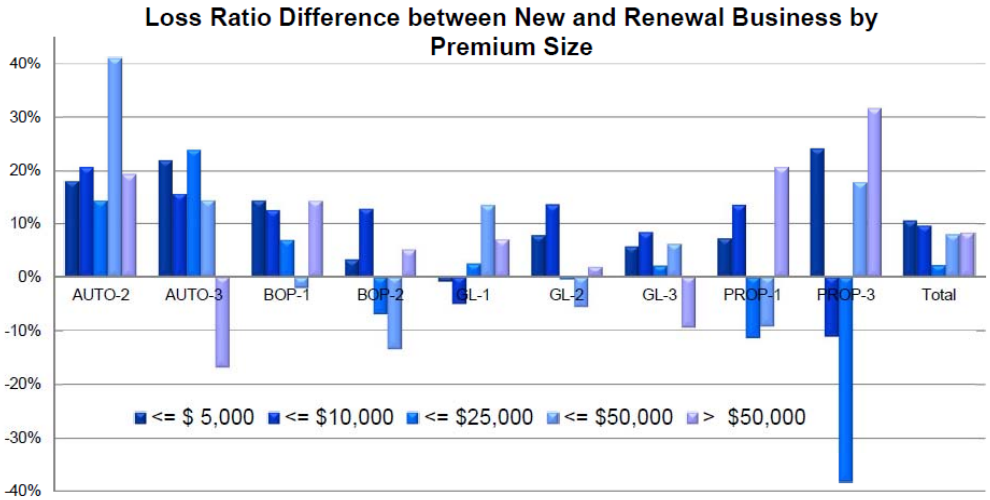


Source: MarketWatch Unleashed @6/2013 – Sample LOB;
85.2B WP from 163M matched renewal policies across GL, CAu, and CF

Rate Changes - Primary
Check for Appropriateness of On-level Factors



Assessing New vs. Renewal Business
Conversion to Index – Impact of Cycle?

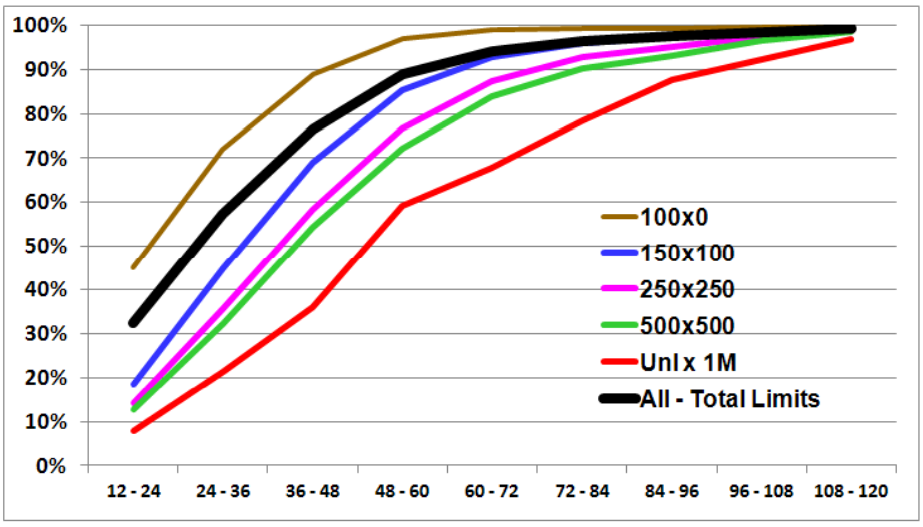


Deloitte. WESTFIELD GROUP

Source: CAS RPM Seminar – March 2012: PMGMT-4

D. Excess Development Factors

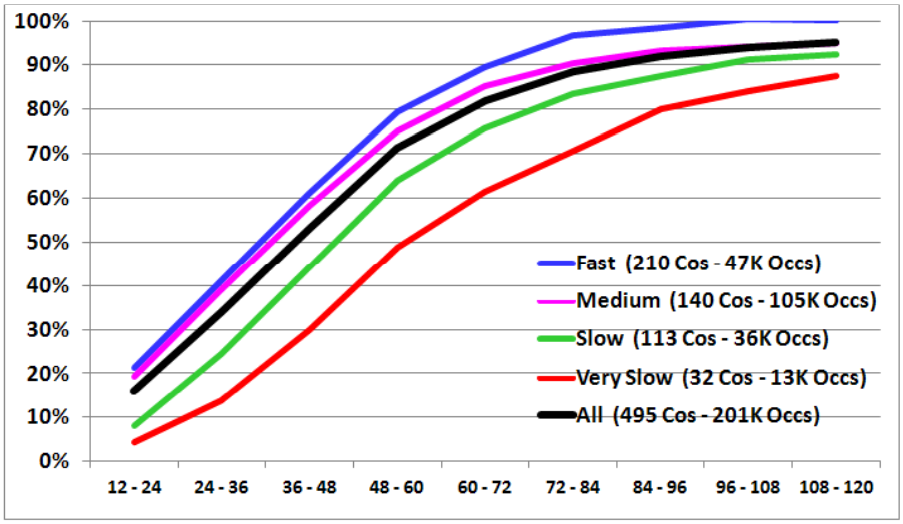
Various Excess LDF Analyses
Sample development factors by Excess Layer



Source: ISO Size of Loss Utility (OL&T - 550 companies - $20.3B Losses excess of 10k)
Assumes no development beyond 120mos for any of the ranges

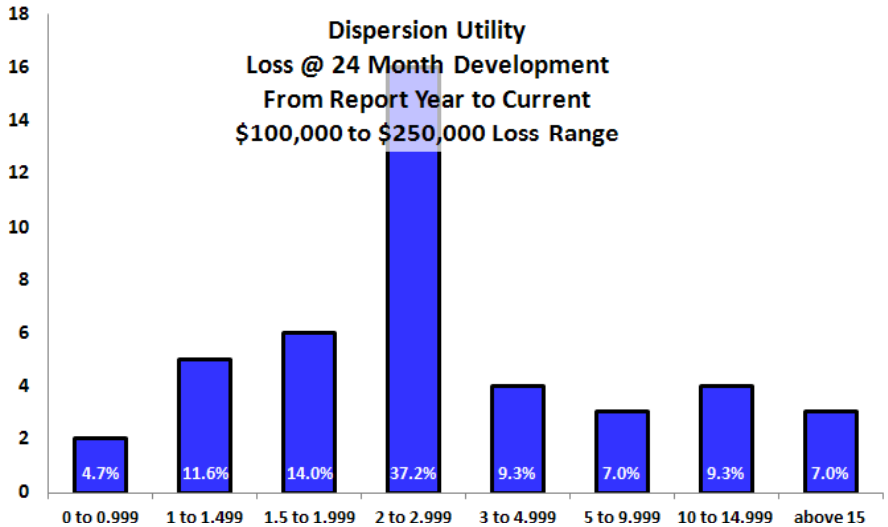
Various Excess LDF Analyses

Sample Dispersion of Company LDFs

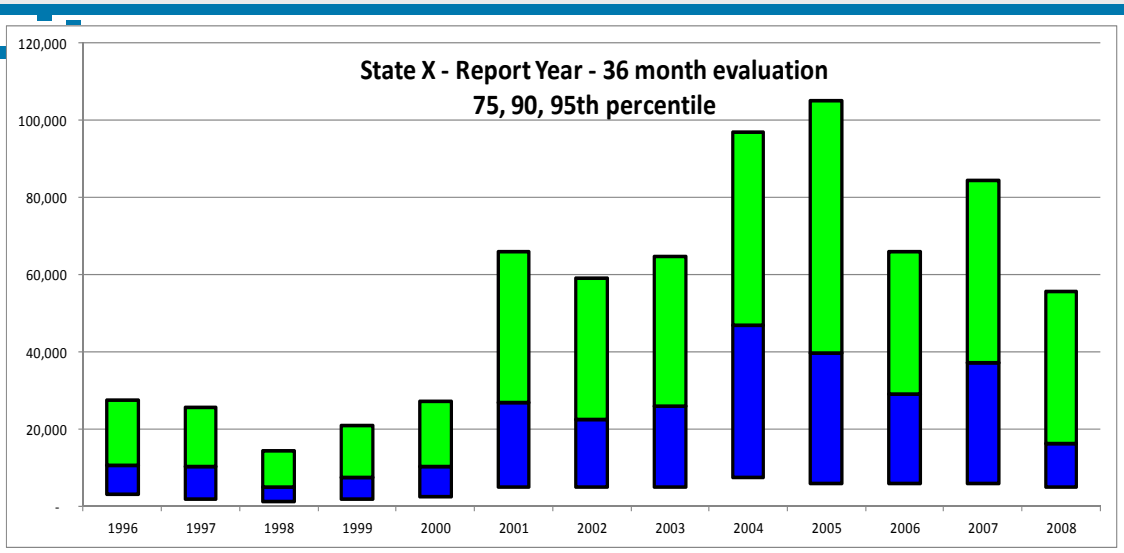


Source: ISO Size of Loss Utility (Contractors - 495 companies - $6.2B Losses excess of $100,000)

Excess Claim Dispersion
Case Study Indication

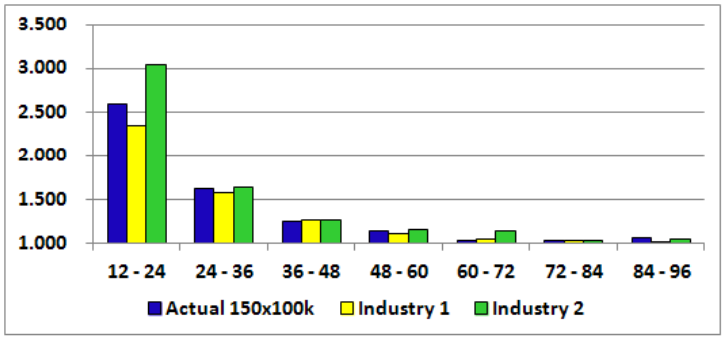


Size-of-Loss Report Year Trend Utility
Percentile Graphing – Illustration #1



To be used as part of ERLI Warning (Emergence-Reinsurance Layer Index) - 2013

Excess Loss Development Factors
Scaling Industry Benchmarks



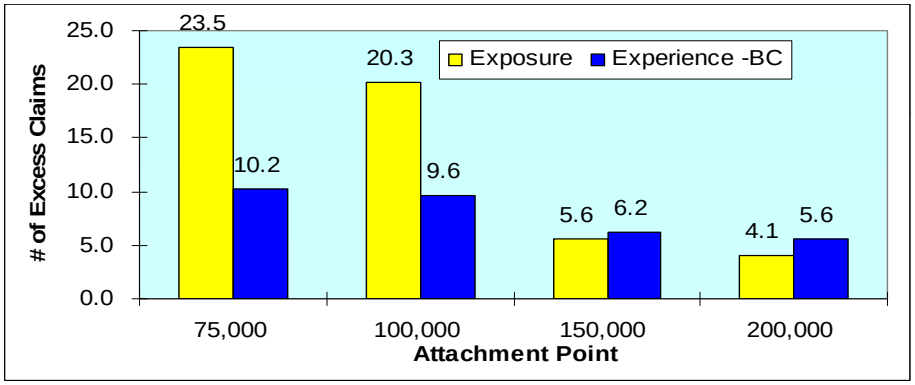
	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120
Numerator	2,844,052	4,592,587	4,475,724	3,735,724	3,590,910	3,222,456	2,576,531	847,885	352,740
Denominator	1,100,000	2,844,052	3,570,800	3,275,724	3,485,724	3,131,986	2,431,386	847,885	352,740
All Year ATA	**2.586**	**1.615**	**1.253**	**1.140**	**1.030**	**1.029**	**1.060**	**1.000**	**1.000**
Industry Factc 150 xs 100K									
Industry 1	**2.346**	**1.575**	**1.267**	**1.113**	**1.052**	**1.024**	**1.015**	**1.010**	**1.009**
Industry 2	**3.047**	**1.627**	**1.263**	**1.157**	**1.138**	**1.032**	**1.049**	**1.023**	**1.004**

	Increase based on:		Indicated Scalar	
	All maturities	36:current	All maturities	36:current
Actual Increase (All numerators - denominators)	**5,198,310**	**1,705,724**		
Expected Increase - Industry 1	**4,743,694**	**1,627,149**	**1.10**	**1.05**
Expected Increase - Industry 2	**6,208,854**	**2,174,393**	**0.84**	**0.78**

Selected industry scalar judgmentally selected after assessing confidence in various industry factors, variation in actual LDFs, number of claims underlying actual and credibility formula

E. Testing Increased Limits Factors

Exposure and Experience Comparison



- **In this case study, there is an inconsistent relationship as move up the attachment points**
- **While the low layer Experience is about half of Exposure, the upper layers are about equal to Exposure**
- **Need more investigation to reconcile and help solve the puzzle**
- **Look for internal submission inconsistencies (oftentimes profile issues), as well as outside help through benchmarking for credibility**

Source: CARe IT 1 – June 2011 – John Buchanan / Mike Angelina

Roll-up Results across Accounts

Test of Default Parameters

- Aggregate across "similar" accounts to evaluate pressure on industry defaults
  - May want to re-rate accounts using e.g. default rate changes, ILFs, premium allocations, LDFs, trends, etc.
- Each individual observation represents a cedant/attachment point exper/expos ratio
- Review dispersion of results and overall trend
  - E.g. if weighted and/or fitted exper/expos ratios are well below 100% (or e.g. 90% if give some underwriter credit) then perhaps default L/Rs overall are too high (or conversely LDFs or trends too light)
  - If trend is up when going from e.g. 100k to 10mm att pt, then perhaps expos curve is predicting well at lower points but is underestimating upper points

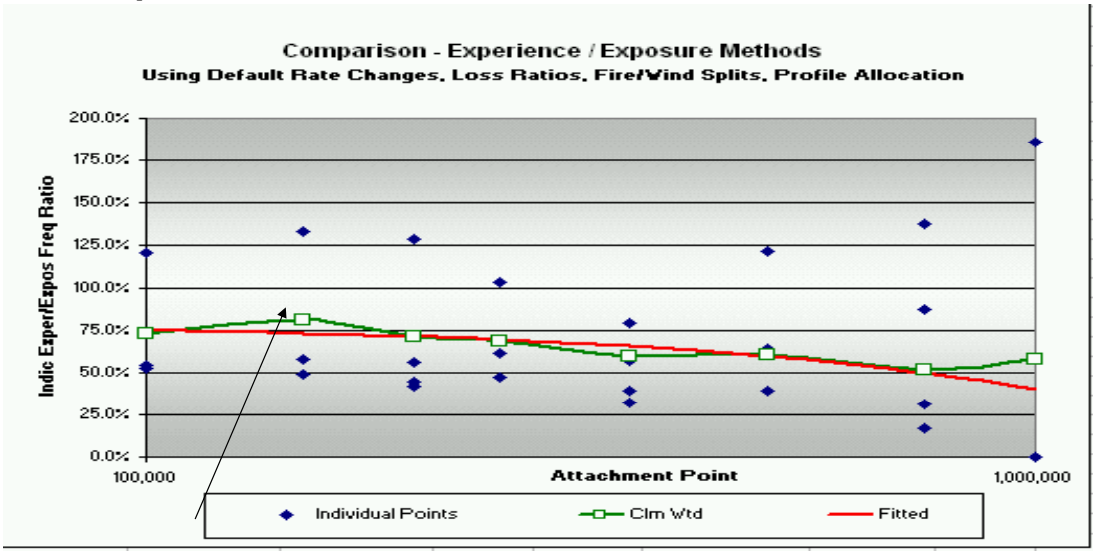
Roll-up Results across Accounts

Test of Default Parameters *(cont.)*

- Before making overall judgments, must consider
  - UW contract selectivity (contracts seen vs. written),
  - Sample size (# of cedants/years),
  - Impact "as-if" data (either current or historical)
  - Survivor bias
  - Systematic bias in models
  - "Lucky"

Hybrid roll-ups: Test of Default Factors

Example 1



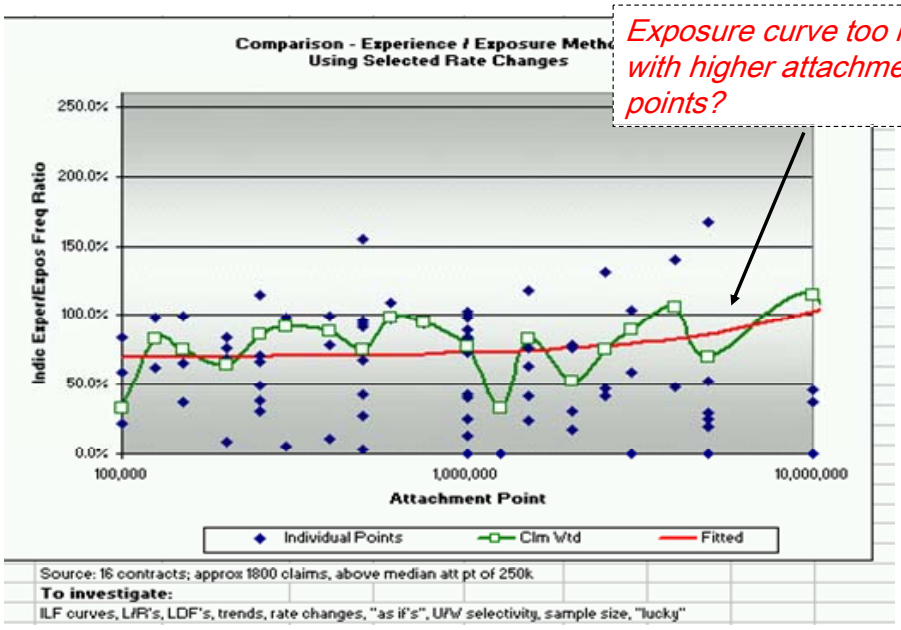
Well below 100%, pressure to reduce expos params or increase exper params…but credible??

Average Exper/Expos Freq Ratio	
Arithmetic Avg=	65.1%
Sumproduct(clms)	72.5%

Dispersion Statistics		
Total # >90%=	7	25.9%
Total 0> # <90%=	20	74.1%
Total # >0%=	27	100.0%
Total # = 0	3	
Total # =	30	
U/W Selectivity =	90.0%	

Source: CARe IT 2 – June 2011 – John Buchanan

Test of Default Rating Factors – Example 2



Exposure curve too light with higher attachment points?

Source: CARe IT 2 – June 2011 – John Buchanan

F. Bringing it All Together

Reinsurance Emergence Testing

Examples – Excess MPL and Primary Casualty

	1	2	3	4	5	6	7
	Trends						
	Ground Up			Excess		Loss Dev't Factors	
	Severity	Freq	Exposure	Severity	Freq	Ground Up	Excess
Property							
Casualty	Used in ET					Used in ET	
Specialty				Used in ET			Used in ET

	8	9	10	11	12	13	14	15
	Rate Changes		Ground-Up	Excess Loss		Region/ Hazard/	Layer Experience/	Emergence
	Primary	Reinsurance	Loss Costs	Factors	ALAE	Subline	Exposure	Testing
Property								
Casualty	Used in ET							IT1-JB
Specialty	Used in ET							IT1-JB

Reinsurance Emergence Testing

- **Start with individual claims and their histories**
- Create ground-up and excess layer LDFs and compare to benchmarks for credibility
  - Create both $ and # claim count triangles
  - Loss year and calculated report year
- Excess trends by threshold - severity and frequency
- Vary thresholds (detrended)
  - e.g. Ground-up, $10,000, $25,000, $50,000, $100,000
- Compare to benchmark severity and frequency trends
- Include exposure base to project future quarterly losses, including rate change estimates
- Estimate expected losses by layer and compare to actual – aggregate across accounts
  - Roll-up quarterly testing by year and inspect to see if hot (or cold) patterns arise for early warning signals

Reinsurance Emergence Index

Sample Individual Claim data and histories

AY	Claim #	State	Subline	Policy Limit	12/31/03	12/31/04	12/31/05	12/31/06	12/31/07	12/31/08	12/31/09	12/31/10
2003	ABC0001	1	CRR	1,000,000	0	0	0	43,176	17,073	17,102	17,102	17,102
2003	ABC0002	2	CRR	1,000,000	0	0	0	0	147,910	147,910	147,910	147,910
2006	ABC0003	1	CRR	1,000,000	0	0	0	0	6,443	8,297	15,450	15,450
2003	ABC0004	1	CRR	1,000,000	0	0	13,903	311,435	312,805	312,805	312,805	312,805
2006	ABC0005	1	CRR	1,000,000	0	0	0	0	0	0	0	42,166
2003	ABC0006	1	CRR	1,000,000	0	11,577	5,706	27,664	16,076	360,897	377,355	378,831
2004	ABC0007	1	CRR	1,000,000	0	0	258,453	255,375	251,860	120,971	120,971	120,971
2003	ABC0008	1	CRR	1,000,000	0	0	0	94,355	14,351	14,351	14,351	14,351
2004	ABC0009	1	CRR	1,000,000	0	0	0	2,177	341,994	455,320	468,139	94,391
2006	ABC0010	1	CRR	2,000,000	0	0	0	0	0	1	1	14,551
2006	ABC0011	1	CRR	2,000,000	0	0	0	0	0	16,710	21,381	47,404
2006	ABC0012	1	CRR	2,000,000	0	0	0	0	0	0	0	20,320
2006	ABC0013	1	CRR	2,000,000	0	0	0	0	0	0	15,001	15,610
2006	ABC0014	1	CRR	2,000,000	0	0	0	0	0	23,222	19,229	16,618
2006	ABC0015	1	CRR	2,000,000	0	0	0	0	0	12,158	35,292	16,804
2006	ABC0016	1	CRR	2,000,000	0	0	0	0	0	0	2	10,067
2006	ABC0017	1	CRR	1,000,000	0	0	0	0	0	20,519	39,000	68,426
2003	ABC0018	1	CRR	1,000,000	0	1,081	27,067	29,824	29,824	29,824	29,824	29,824
2003	ABC0019	1	CRR	1,000,000	0	7,616	7,718	16,572	30,216	153,340	153,340	153,340
2006	ABC0020	1	CRR	1,000,000	0	0	0	0	0	11,502	11,502	11,502
2003	ABC0021	1	CRR	1,000,000	0	4,654	15,386	15,386	15,386	15,386	15,386	15,386
2005	ABC0022	1	CRR	1,000,000	0	0	0	15,745	15,745	15,745	15,745	15,745
2003	ABC0023	1	CRR	1,000,000	0	0	2,153	149,677	149,917	149,917	149,917	149,917
2003	ABC0024	1	CRR	1,000,000	0	508	122,889	126,775	681,869	681,868	755,276	735,403
2003	ABC0025	1	CRR	1,000,000	0	78,435	77,177	128,449	388,870	639,199	660,562	660,562

Information Emergence

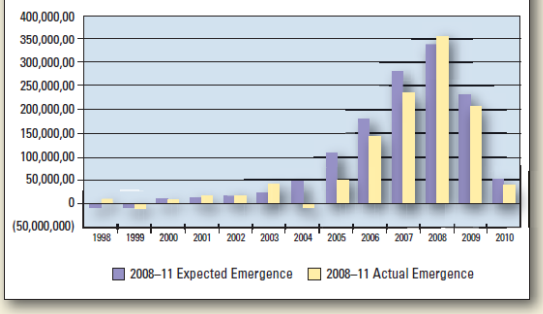
To help identify where we are in the underwriting cycle, it is important to perform "emergence testing." That is, the actuary should set up his total loss expectations for any individual contract, and specify how he expects those losses will be reported over each of the subsequent quarters or years. Over time, these expectations should then be compared with what has actually been reported.

For example, the expected losses for a particular contract might be $1 million. Further, it may be expected that these claims will be reported over each of the remaining five years in the following pattern: $100,000, $300,000, $300,000, $200,000, and $100,000. Since any one account will have a significant amount of variation attached to it, it is important to combine the accounts, to try to detect an overall pattern. And, most important, this is valuable for detecting any recent patterns, to see if there are any pressures on the initial assumptions that were made, and to identify any new loss plateaus or spikes.

To review the MPL industry in general, and to help identify any recent changes in loss activity, the figure below is an illustration of the accumulation of emergence from accounts of a reinsurer over the last four years. In keeping with the other figures, this emergence roll-up shows that period 2007 and prior years has behaved favorably in general over the last four years (with the exception of a minor spike in 2003). For 2008 and subsequent years, it is still too early to tell whether they will also yield better results than expected. In fact, at this point, 2008 is showing slightly worse results than what we would have expected.

Analyzing this information emergence provides a critical early warning tool. Appropriate analysis will determine when, and to what extent, insurers or reinsurers have entered into "hot water." And they should adjust how much business they underwrite accordingly.

Actual vs. Expected Four Year ('08–'11) All Layers (Contract + Lower)



Source: *Physician Insurer*, Fourth Quarter 2011, a publication of the Physician Insurers Association of America; J. Buchanan pg. 33

Estimating Individual Claims at Ultimate with Benchmarks Steps and Complexities

- **Goal: Produce a set (or sets) of individual losses at an ultimate basis**
  - developed, trended, dispersed, and adjusted for other factors.
  - aggregate or roll-up accounts to produce inputs for a curve-fitting routine to benchmark against industry ELFs.
  - especially needed in lines or countries without good benchmarks
- **Excess Development:**
  - Evaluate whether company is fast, medium, slow, or extra slow compared to aggregate industry
  - Include soft market vs. hard market coverage differentiators (e.g 1997-2001 have different set of agg LDFs per RAA et al)
  - Evaluate large industry portion of development coming in 20+ years (e.g. RAA GL excl mass tort shows significant very late devt)
  - Also for tail considerations, perhaps add on some simulated measure of fresh IBNYR claims
  - Estimate total aggregate layer excess LDFs - credibility weight indicated with scaled industry factors
  - Use Report Year if possible, with benefit that LDFs aren't so large
  - Vary individual excess LDFs by size of loss - do larger claims develop faster or slower?
  - Be careful of large claim trap (e.g. large claims are already large, so may not need additional large LDFs (numerator/denominator issue)
  - Evaluate dispersion of development factors; understate variability if apply the same LDF to all claims
  - Apply LDFs to open claims only, and look for off-balance
- **Excess Trend:**
  - Select severity trend factor based upon study by size-of-loss
  - Perhaps vary by year
- **Other factors:**
  - Break apart components of claims into e.g. medical vs. indemnity or economic vs. non-economic
  - Evaluate impact of historical and/or changing policy limits
- **Randomization:** Perhaps simulate all of the above effects for different scenario calculations

On the Path to Excess Loss Factors

Sample Calculation of Individual Claims at Ultimate

Acc Date	Accident Year	Report Year	Incurred Loss+ALAE @12/31/2010	OS Loss	Excess LDF	Excess Trend	Other Factors	Random ization	Estimated Ultimate Loss
04/25/01	2001	2004	102,740	0	1.000	1.63	1.000	1.000	167,353
10/17/01	2001	2006	125,422	80,000	1.225	1.63	1.000	1.000	250,266
10/25/01	2001	2001	285,145	0	1.000	1.63	1.000	1.000	464,471
03/20/02	2002	2002	268,459	0	1.000	1.55	1.000	1.000	416,467
07/04/02	2002	2005	245,145	0	1.000	1.55	1.000	1.000	380,300
03/03/03	2003	2003	240,469	200,000	1.132	1.48	1.000	1.000	402,180
03/20/03	2003	2004	305,957	0	1.000	1.48	1.000	1.000	452,037
04/23/03	2003	2003	202,446	0	1.000	1.48	1.000	1.000	299,105
07/05/03	2003	2003	185,731	0	1.000	1.48	1.000	1.000	274,409
07/09/03	2003	2003	275,862	250,000	1.132	1.48	1.000	1.000	461,373
08/01/03	2003	2004	1,072,244	0	1.000	1.48	1.000	1.000	1,584,192
10/18/03	2003	2007	140,469	0	1.000	1.48	1.000	1.000	207,537
10/25/03	2003	2005	445,040	0	1.000	1.48	1.000	1.000	657,527
02/09/04	2004	2006	64,130	0	1.000	1.41	1.000	1.000	90,238
11/19/08	2008	2009	150,862	125,000	1.687	1.16	1.000	1.000	294,620
07/14/09	2009	2009	1,566,356	100,000	1.298	1.10	1.000	1.000	2,241,526
11/04/09	2009	2009	164,636	100,000	1.687	1.10	1.000	1.000	306,209
04/03/10	2010	2010	1,039,423	1,000,000	1.375	1.05	1.000	1.000	1,500,668
45			14,722,580	4,784,000					20,386,858

Case Study

Emergence Information to Reserving (IT4)

Treaty Year	Adjusted Subject Earned Premium	Subject Reported L&ALAE	Subject Reported Counts	Severity Trend	Frequency Trend	Adjusted Subject Reported L&ALAE	Adjusted Subject Reported Counts	XS LDF	LDF Burn Cost	Cape Cod Burn Cost	Selected Burn Cost	Selected Ultimate Adjusted Subject L&ALAE
2001	26,471,130	0	0	**1.657**	1.000	51,032	1	1.070	**0.21%**	**0.21%**	0.21%	54,605
2002	25,839,654	121,638	1	**1.573**	1.000	125,048	1	1.082	**0.52%**	0.51%	0.52%	135,302
2003	23,751,778	962,293	7	**1.484**	1.000	1,137,320	7	1.101	**5.27%**	4.96%	5.27%	1,252,189
2004	24,116,512	548,373	3	**1.415**	1.000	745,593	4	1.129	**3.49%**	3.35%	3.49%	841,775
2005	27,085,710	101,634	1	**1.335**	1.000	101,865	2	1.174	**0.44%**	0.66%	0.44%	119,589
2006	26,124,453	433,472	1	**1.268**	1.000	433,472	1	1.249	**2.07%**	2.04%	2.07%	541,406
2007	32,301,844	383,064	3	**1.211**	1.000	383,064	3	1.396	**1.66%**	1.72%	1.66%	534,757
2008	37,808,219	295,429	4	**1.154**	1.000	372,765	5	1.704	**1.68%**	1.75%	1.68%	635,192
2009	41,489,120	0	0	**1.100**	1.000	157,264	1	2.506	0.95%	**1.45%**	1.45%	600,223
2010	40,992,570	103,942	1	**1.049**	1.000	104,136	1	6.192	1.57%	**1.74%**	1.74%	712,519
Total	305,980,990	2,949,845	21			3,611,558	26		1.68%	1.77%	1.77%	5,427,557
Prospective 2011	40,000,000										**1.85%**	**741,067**

Selected	**2.75%**	**1,100,000**

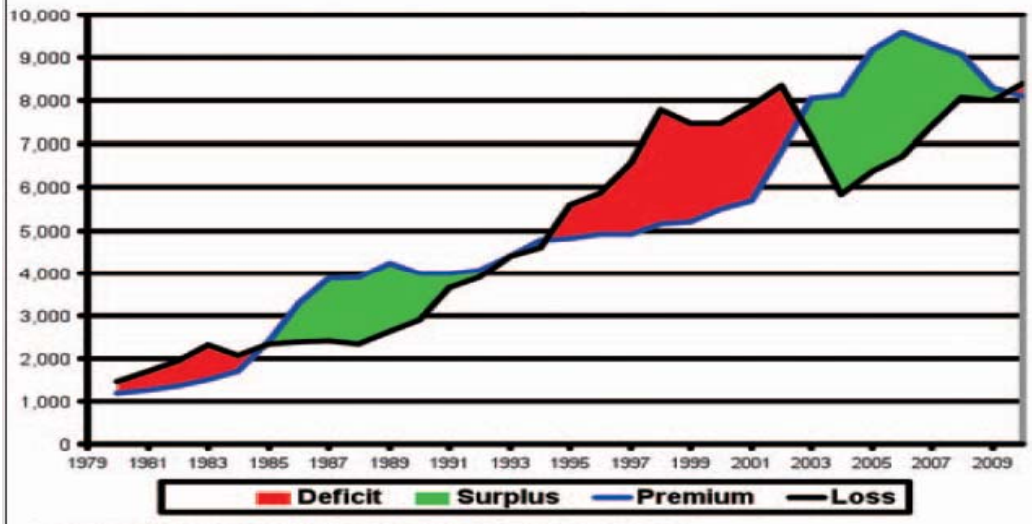
Expected Emergence - Pricing Assumptions

PremOps-1 100x100	**12**	**24**	**36**	**48**	**60**	**72**	**84**	**96**	**108**	**120**	**120+**
Selected ATU	6.192	2.506	1.704	1.396	1.249	1.174	1.129	1.101	1.082	1.070	
Selected Cum'l % Reptd	16.1%	39.9%	58.7%	71.6%	80.1%	85.2%	88.6%	90.8%	92.4%	93.5%	100.0%
Selected Incr % Reptd	16.1%	23.8%	18.8%	12.9%	8.4%	5.1%	3.4%	2.3%	1.6%	1.0%	6.5%
Incremental Reported	**177,649**	**261,298**	**206,593**	**142,426**	**92,739**	**56,263**	**37,346**	**24,778**	**17,544**	**11,402**	**71,963**
Cumulative Reported	177,649	438,947	645,540	787,966	880,705	936,968	974,314	999,092	1,016,636	1,028,037	1,100,000

NB: After each contract is written, the expected ultimate losses, along with reporting, payment, premium, and commission patterns reflecting all treaty terms and conditions (e.g. AADs…) should be given to reserving for their initial selections and subsequent testing. For more robust pricing/reserving links and other management purposes items like capital usage, expected loss and combined ratios, expected investment income, ROEs and other pricing assumptions such as trends, LDFs, rate changes, and ILFs selected should be given as well.

Analyzing the Market Cycle
Numerators and Denominators

Figure 4 Historical Look at MPL Industry Underwriting Performance–Accident Year



Source: MPL Sch P @ 12/31/2010 by Rich Lino - Oliver Wyman
AY reported results including IBNR reported as of December 31, 2010 (or 9 years after AY, if earlier)
AY estimates reflect investment yield of 0.5% above 5-year US Treasury Rate
Actual posted results through 12/31/2010

Source: *Physician Insurer*, Fourth Quarter 2011, a publication of the Physician Insurers Association of America; J. Buchanan pg. 33

Emergence Lag – Impact of Wrong Signals

Figure 1 Underwriting Cycle – Accident Year (AY) vs. Calendar Year (CY)

Apparent vs. Actual Market Signals – Operating Results

Sch P Year	CY	AY @2010	CY vs. AY Difference	"Breakeven"	"Apparent" Market	"Actual" Market
1980	100%	121%	21.7%	95.0%	Transitional	Soft
1981	101%	134%	33.0%	95.0%	Transitional	Soft
1982	110%	142%	32.8%	95.0%	Transitional	Soft
1983	109%	153%	44.6%	95.0%	Transitional	Soft
1984	118%	121%	2.3%	95.0%	Soft	Soft
1985	130%	96%	-33.5%	95.0%	Soft	Transitional
1986	109%	72%	-36.4%	95.0%	Transitional	Hard
1987	92%	62%	-29.8%	95.0%	Transitional	Hard
1988	84%	60%	-24.1%	95.0%	Transitional	Hard
1989	61%	62%	0.9%	95.0%	Hard	Hard
1990	69%	73%	4.2%	95.0%	Hard	Hard
1991	67%	91%	24.6%	95.0%	Hard	Transitional
1992	76%	95%	19.1%	95.0%	Hard	Transitional
1993	65%	100%	34.6%	95.0%	Hard	Transitional
1994	69%	96%	27.2%	95.0%	Hard	Transitional
1995	71%	117%	46.0%	95.0%	Hard	Soft
1996	76%	119%	43.0%	95.0%	Hard	Soft
1997	78%	134%	56.0%	95.0%	Hard	Soft
1998	88%	151%	63.7%	95.0%	Transitional	Soft
1999	106%	143%	37.4%	95.0%	Transitional	Soft
2000	106%	136%	29.7%	95.0%	Transitional	Soft
2001	136%	138%	2.8%	95.0%	Soft	Soft
2002	130%	122%	-7.4%	95.0%	Soft	Soft
2003	122%	89%	-33.0%	95.0%	Soft	Transitional
2004	96%	72%	-24.0%	95.0%	Transitional	Hard
2005	87%	70%	-17.4%	95.0%	Transitional	Hard
2006	72%	70%	-2.4%	95.0%	Hard	Hard
2007	68%	79%	11.8%	95.0%	Hard	Hard
2008	70%	89%	19.0%	95.0%	Hard	Transitional
2009	72%	96%	24.8%	95.0%	Hard	Transitional
2010	64%	104%	39.9%	95.0%	Hard	Transitional
2011					?	?

Red Years = CY indications -> write MORE business, while actual results much WORSE (average=41% worse)
Blue Years = CY indications -> write LESS business, while actual results much BETTER (average = 29% better)
Green Years = Actual Results TBD after Information Emerges

Actuarial Overconfidence

Figure 3 Information Gap—Calendar Year (CY) vs. Accident Year (AY)

# Years	Actual - AY			
Apparent - CY	Hard	Transitional	Soft	Total
Hard	4	7	3	14
Transitional	5	0	7	12
Soft	0	2	3	5
Total	9	9	13	31

Avg. LR Gap	Actual - AY			
Apparent - CY	Hard	Transitional	Soft	Total
Hard	3.6%	27.0%	48.4%	24.9%
Transitional	-26.4%	0.0%	37.5%	10.9%
Soft	0.0%	-33.2%	-0.8%	-13.8%
Total	-13.0%	13.6%	31.2%	

Source: *Physician Insurer*, Fourth Quarter 2011, a publication of the Physician Insurers Association of America; J. Buchanan pg. 33

Verisk Analytics

G. Appendix