Concurrent Session 18:
Perspectives on Excess Casualty Loss Development

CAS/CARe Seminar, Bermuda, June 6-7, 2013

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Framing Today's Presentations

Perspectives on Excess Development (CS 18)

	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				CS18-DY		CS18-DY	CS18-MC/DY
Specialty							CS18-MC

	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				CS18-DY		CS18-DY		CS18-DY
Specialty								

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

Agenda:

Perspectives on Excess Casualty Loss Development

- **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
- **Overview: ISO Excess Development**
  - ❑ Sources:
    - Aggregated
    - Individual Claim / Histories
  - ❑ Lines/classes of business and volume comparisons
  - ❑ Types of possible analyses
- **Various Excess Analyses**
  - ❑ Aggregate excess LDFs – impact of attachment point
  - ❑ Company excess LDF – variability (Fast, Med, Slow, Very Slow)
  - ❑ Report year vs. accident year
  - ❑ Claim dispersion
  - ❑ Excess percentiles distributions (boxplots)
- **Case Study to Sarah**
  - ❑ Submission vs. Industry Benchmarks
  - ❑ On path to ILFs
  - ❑ Expected emergence

** Jeffrey Dollinger – International Reinsurance: The Education of an American Actuary – CAGNY May 2013*

Overview: Comparison of ISO Excess Loss Development and Trend Sources

	Excess Layer Loss Development Manuals	Size-of-Loss Matrix	Size-of-Loss Utility	UXS
Release	First released 1998; every other year since	First released Fall 2012; next release Summer 2013	First release expected Fall 2013	First released 2005; most recent Spring 2013
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 claims (masked)
Lines / Classes of Business Covered	GL (PremOps, Prods), CAu, MPL (CM, Occ)	GL (7 sublines, total), CAu (3 sublines, total)	same as SOLM	
Accident Years	Last 20 years	Last 12 years (current)	same as SOLM	
# of Companies	550	600	same as SOLM	
Volume (untrended): Ground-Up >100k * >1M *	<u>GL, CAu, MPL</u> 147.2B (#=13.5M) 60.2B (#=910K) 5.1B (#=16.5K)	<u>GL, CAu</u> 109.1B (#=7.1M) 45.6B (#=139K) 7.5B (#=3.9K)	 same as SOLM same as SOLM same as SOLM	10,700 Umbrella / Excess claims
Types of Analyses	**Layer Loss Development Factors** Excess Severity Trends	**Layer Loss Development Factors** Excess Frequency and Severity Trends Line/class profitability	**Layer Loss Development Factors** Excess Frequency and Severity Trends AY vs. RY Claim dispersions Company differentials - F, M, S, VS Excess percentile distributions	

**** XSLDM is >= threshold shown***

Excess Layer Loss Development Manuals
Sample Exhibit

Excess Loss Development Manuals - Sample Exhibit

PREMISES/OPERATIONS LIABILITY---ALAE EXCLUDED
INCURRED LOSSES (THOUSANDS)

$25,000 TO $50,000
Years Of Development

Accident Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1988	79,933	194,314	276,569	320,214	326,935	326,196	329,649	327,492	326,828	326,998	327,636	327,729	328,771	329,248	329,569	330,068	330,417	330,717	331,241	331,600
1989	93,266	215,183	304,673	343,250	351,722	359,220	355,180	354,263	353,168	353,664	353,702	354,222	354,106	354,192	354,942	355,536	355,964	356,007	356,358	
1990	100,791	226,633	302,796	339,789	358,513	358,529	360,028	360,075	359,349	360,449	361,599	361,813	362,149	362,552	362,748	363,220	363,143	363,342		
1991	102,374	216,305	286,016	330,372	337,453	340,598	341,330	341,808	342,314	343,079	343,593	343,656	343,941	344,569	344,768	344,892	345,064			
1992	92,458	196,293	270,337	295,825	308,074	310,339	310,398	309,717	310,321	311,370	310,915	310,889	311,201	311,176	311,294	311,456				
1993	92,559	197,296	259,493	291,009	299,296	301,952	302,480	304,257	303,746	303,974	304,672	305,206	305,412	305,496	305,983					
1994	105,742	209,923	284,789	320,671	333,392	336,879	338,110	340,076	340,039	340,620	340,992	341,350	341,197	341,438						
1995	86,904	191,229	263,283	297,304	309,166	317,465	319,248	319,981	320,656	322,114	322,068	322,236	323,205							
1996	94,188	205,677	281,217	319,513	337,363	342,497	342,685	345,115	346,505	346,446	347,053	347,413								
1997	103,797	210,253	291,245	334,496	350,944	358,363	359,954	360,648	360,752	361,426	362,176									
1998	95,638	208,120	289,483	333,021	351,007	355,580	356,954	356,645	357,196	357,572										
1999	103,236	219,965	306,598	361,091	377,566	382,617	380,557	380,137	380,564											
2000	99,904	216,941	313,994	358,564	371,936	372,999	370,967	371,279												
2001	101,110	215,782	289,644	326,175	333,891	334,742	335,272													
2002	93,154	186,082	255,772	290,750	297,508	297,411														
2003	93,468	195,942	265,823	294,329	299,836															
2004	101,244	205,331	264,665	296,760																
2005	108,081	208,778	286,078																	
2006	113,935	230,073																		
2007	143,598																			

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	46,649,277	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													

Size of Loss Utility

Sample Exhibit

		Line of Business	Market
Major Class	CA&GL	CA&GL	Combined
Loss Min	100,001		
Loss Max	>1,000,000		
Statistic	OCCURENCE COUNT		

	12	24	36	48	60	72	84	96	108	120
AY 1997	2,570	5,348	7,419	8,724	9,533	9,897	10,198	10,265	10,294	10,346
AY 1998	2,683	5,459	7,792	9,327	10,152	10,568	10,646	10,689	10,782	10,828
AY 1999	2,774	5,719	8,185	9,824	10,833	11,015	11,108	11,198	11,278	11,336
AY 2000	2,589	5,528	7,962	9,678	10,395	10,547	10,597	10,704	10,737	10,763
AY 2001	2,544	5,494	7,793	9,391	9,880	9,989	10,088	10,126	10,162	10,208
AY 2002	2,471	5,331	7,538	8,791	9,142	9,289	9,355	9,344	9,365	9,381
AY 2003	2,562	5,584	7,690	8,704	9,093	9,234	9,256	9,247	9,290	
AY 2004	2,914	6,002	7,980	8,986	9,425	9,496	9,501	9,542		
AY 2005	3,063	6,504	8,534	9,547	9,819	9,938	9,963			
AY 2006	3,378	6,651	8,685	9,570	9,850	10,028				
AY 2007	3,458	6,907	8,880	9,889	10,209					
AY 2008	3,112	6,437	8,278	9,109						
AY 2009	3,029	6,289	8,068							
AY 2010	3,099	6,398								
AY 2011	3,186									
	128,937	**138,655**								

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108
AY 1997	2.081	1.387	1.176	1.093	1.038	1.030	1.007	1.003	1.005
AY 1998	2.035	1.427	1.197	1.088	1.041	1.007	1.004	1.009	1.004
AY 1999	2.062	1.431	1.200	1.103	1.017	1.008	1.008	1.007	1.005
AY 2000	2.135	1.440	1.216	1.074	1.015	1.005	1.010	1.003	1.002
AY 2001	2.160	1.418	1.205	1.052	1.011	1.010	1.004	1.004	1.005
AY 2002	2.157	1.414	1.166	1.040	1.016	1.007	0.999	1.002	1.002
AY 2003	2.180	1.377	1.132	1.045	1.016	1.002	0.999	1.005	
AY 2004	2.060	1.330	1.126	1.049	1.008	1.001	1.004		
AY 2005	2.123	1.312	1.119	1.028	1.012	1.003			
AY 2006	1.969	1.306	1.102	1.029	1.018				
AY 2007	1.997	1.286	1.114	1.032					
AY 2008	2.068	1.286	1.100						
AY 2009	2.076	1.283							
AY 2010	2.065								
	12 - 24	**24 - 36**	**36 - 48**	**48 - 60**	**60 - 72**	**72 - 84**	**84 - 96**	**96 - 108**	**108 - 120**
1997-2001	**2.094**	**1.421**	**1.199**	**1.082**	**1.024**	**1.012**	**1.007**	**1.005**	**1.004**
2002+	**2.077**	**1.324**	**1.123**	**1.037**	**1.014**	**1.003**	**1.001**	**1.003**	**1.002**

Excess Umbrella Data Compilation

- General Liability and Commercial Automobile data used in ISO ILF reviews
- 2013 release has approximately 10,700 Umbrella/Excess Occurrences
  - Includes approximately 1,300 newly settled stat-plan-reported occurrences
  - Includes approximately 900 additional "drop-down" occurrences
  - Increase from 2012 release which included 8,530 Occurrences
- Data fields include
  - State, Accident Year, Payment Lag, Loss Amount, Loss Type
  - ALAE amount, Umbrella or Excess Limit, Attachment Point
- Company list included for each data group but not by individual loss record

UXS Claim Counts by Estimated Major Loss Types

Source	Auto	PremAuto	Prem	Prod	Total
CSP	208	2,577	733	625	4,143
DropDown	140	814	1,075	639	2,668
SpecCall	1,496	0	1,841	550	3,887
Total	1,844	3,391	3,649	1,814	10,698

Various Excess LDF Analyses

Sample Excess Triangle – OL&T Excess of $100,000 (untrended)

Major Class	1
Min	100,000
Max	1,000,000,000
Type	Accident Year
LDF Speed	Medium

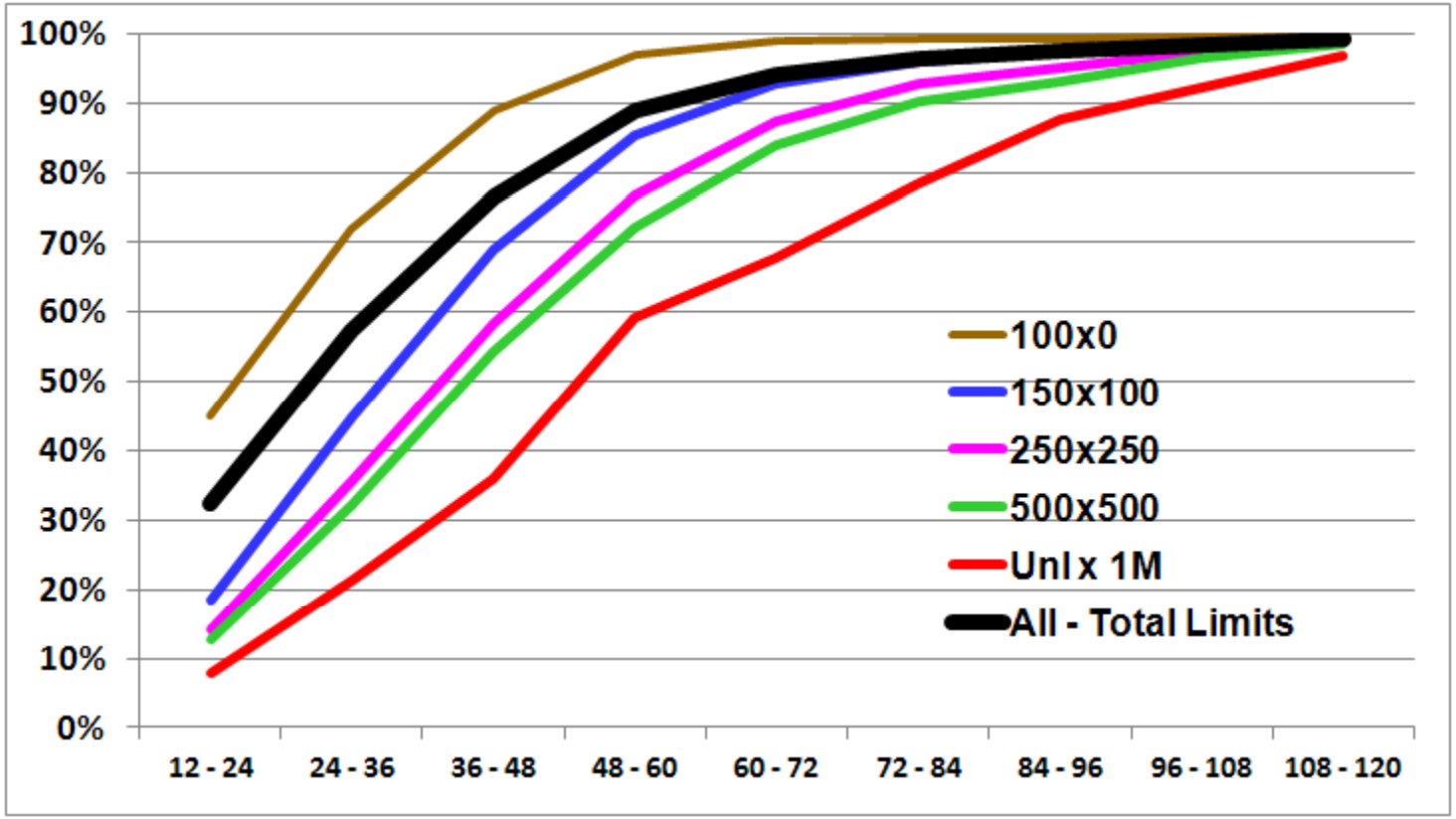
Line of Business Market

GL Owners, Landlords, and Tenants

	12	24	36	48	60	72	84	96	108	120
1997	131,054,469	296,688,323	449,820,311	571,023,724	614,592,109	639,311,281	662,779,839	672,953,665	675,343,454	679,705,220
1998	118,215,318	351,671,296	507,473,508	628,461,693	692,015,745	710,518,223	714,241,490	726,740,761	741,310,960	744,118,610
1999	141,279,451	323,492,015	479,460,622	576,755,790	634,407,185	647,684,598	650,985,611	666,806,860	678,894,498	686,233,294
2000	145,789,291	301,888,584	469,317,263	575,684,992	613,658,301	634,378,126	637,917,719	650,464,541	659,944,668	670,411,925
2001	119,550,221	273,524,286	421,420,574	538,010,624	588,125,417	621,660,283	636,139,909	647,199,676	652,095,333	660,927,632
2002	123,847,315	268,045,483	416,631,579	504,891,792	547,793,218	574,450,604	613,538,514	613,994,634	619,333,507	620,213,259
2003	117,436,080	263,246,107	408,039,579	466,454,564	515,971,418	533,592,506	539,724,054	548,614,843	555,099,610	
2004	114,982,592	287,204,675	399,470,552	509,395,157	554,762,358	571,070,141	576,255,470	581,328,004		
2005	130,845,680	290,584,065	465,921,568	554,417,690	584,050,971	610,337,661	613,497,195			
2006	153,793,808	303,911,160	433,702,362	533,737,602	581,528,657	593,060,130				
2007	157,515,749	363,185,367	518,485,440	626,604,931	673,043,887					
2008	144,493,415	332,816,800	470,954,581	574,916,243						
2009	157,648,966	342,134,688	503,025,702							
2010	142,506,687	325,216,703								
2011	145,968,981									
	7,959,667,706	8,626,766,395								

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108
1997	2.264	1.516	1.269	1.076	1.040	1.037	1.015	1.004	1.006
1998	2.975	1.443	1.238	1.101	1.027	1.005	1.018	1.020	1.004
1999	2.290	1.482	1.203	1.100	1.021	1.005	1.024	1.018	1.011
2000	2.071	1.555	1.227	1.066	1.034	1.006	1.020	1.015	1.016
2001	2.288	1.541	1.277	1.093	1.057	1.023	1.017	1.008	1.014
2002	2.164	1.554	1.212	1.085	1.049	1.068	1.001	1.009	1.001
2003	2.242	1.550	1.143	1.106	1.034	1.011	1.016	1.012	
2004	2.498	1.391	1.275	1.089	1.029	1.009	1.009		
2005	2.221	1.603	1.190	1.053	1.045	1.005			
2006	1.976	1.427	1.231	1.090	1.020				
2007	2.306	1.428	1.209	1.074					
2008	2.303	1.415	1.221						
2009	2.170	1.470							
2010	2.282								

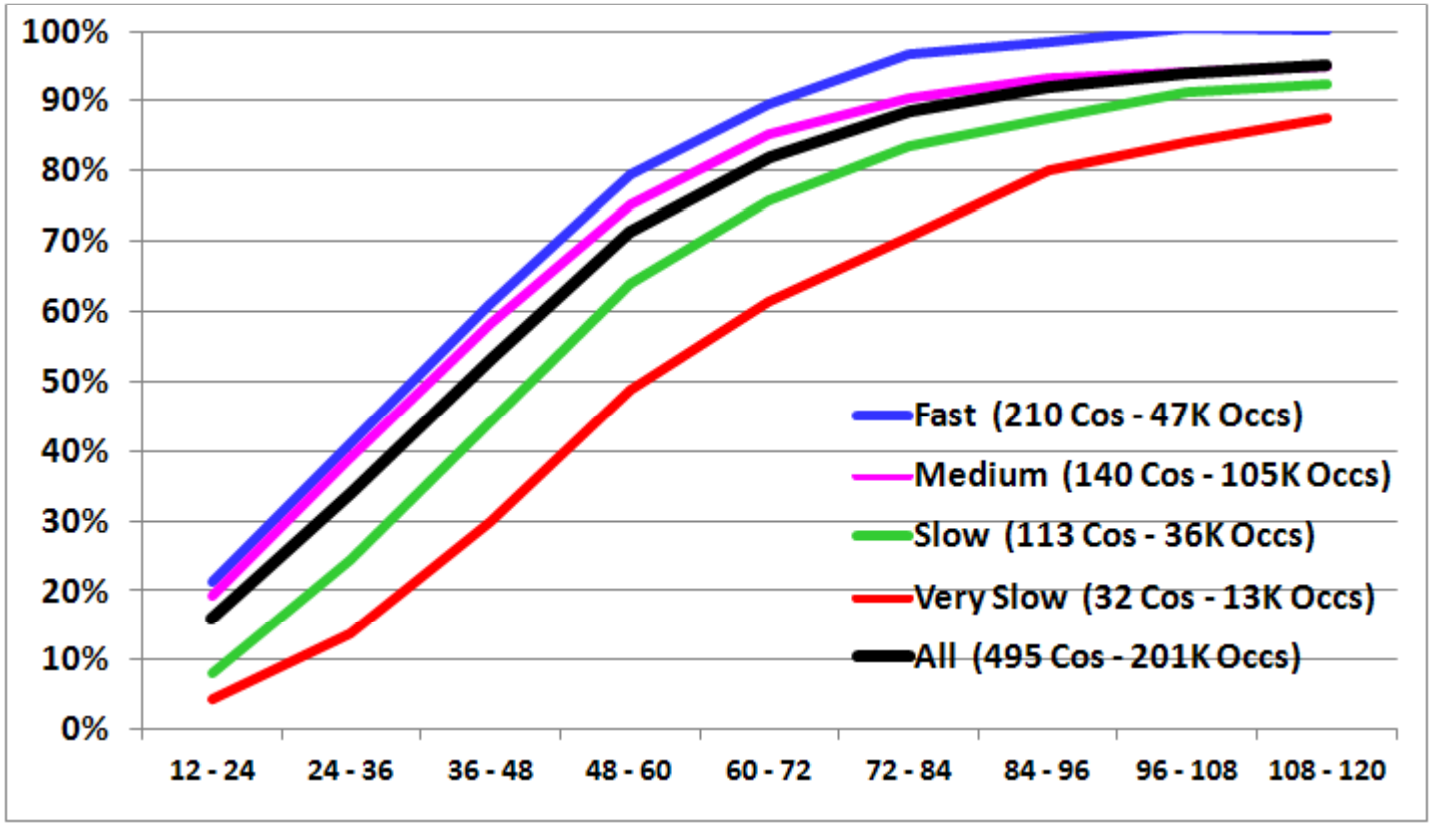
Various Excess LDF Analyses
Sample development factors by Excess Layer



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

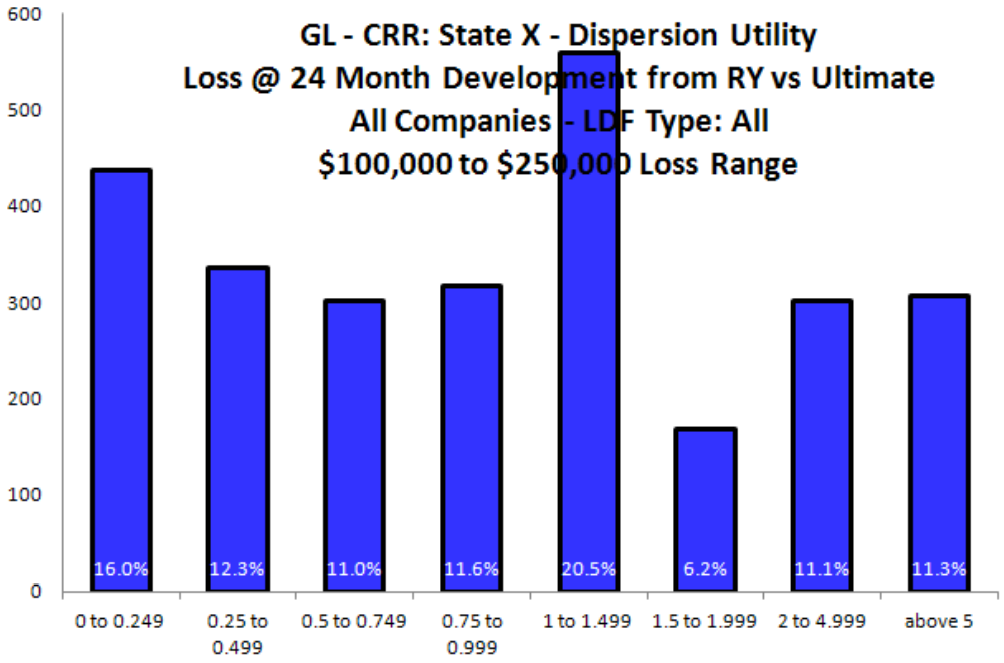
Sample Dispersion of Company LDFs



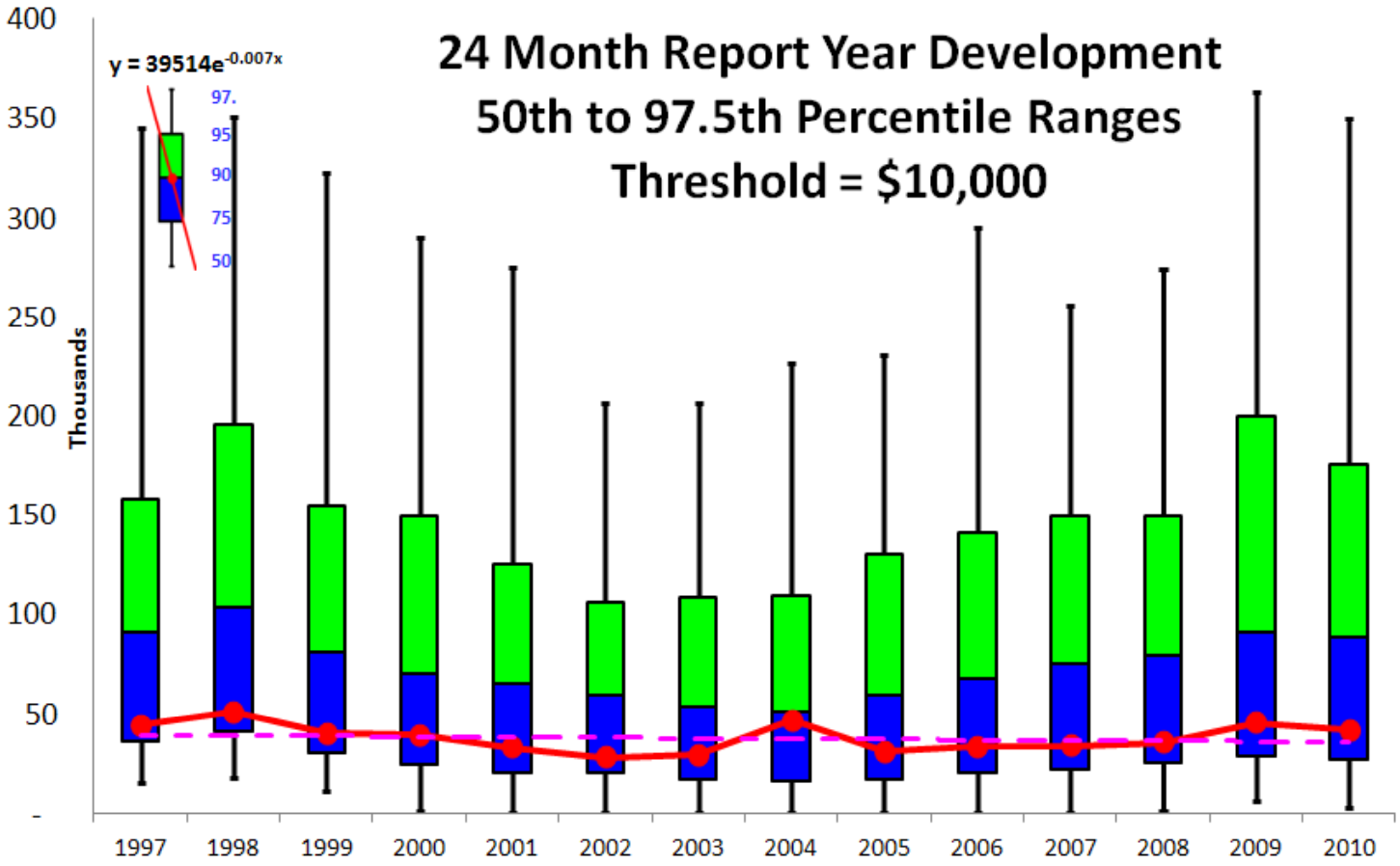
Source: ISO Size of Loss Utility (Contractors - 495 companies - $6.2B Losses excess of $100,000)

Excess Claim Dispersion
Industry Data Sample

GL	Line of Business (GL, CA, MPL)	100,000	loss min
CRR	Subline	250,000	loss max
RY	Year Type (AY, RY, CY)	2	# yr maturity
X	State		Include claims that:
All	Company LDF	0	develop to 0? (1=y, 0=n)
All	Company	0	are fully developed? (1=y, 0=n)
	All Companies		
2010	Latest Report Year in Data		
2,727	Total Count Dispersed		



Excess Percentile Distributions
Industry Data



51,425 Underlying number of claims greater than threshold
Underlying number of companies

Case Study

Individual Claims / Histories - Building Blocks (Case Study)

Acc Date	Accident Year	Report Year	12/31/2001	12/31/2002	12/31/2003	12/31/2004	12/31/2005	12/31/2006	12/31/2007	12/31/2008	12/31/2009	12/31/2010
04/25/01	2001	2004				25,000	25,000	102,740	102,740	102,740	102,740	102,740
10/17/01	2001	2006						10,000	80,000	80,000	80,000	80,000
10/25/01	2001	2001	10,000	25,000	50,000	100,000	150,000	200,000	285,145	285,145	285,145	285,145
03/20/02	2002	2002		100,000	268,459	268,459	268,459	268,459	268,459	268,459	268,459	268,459
07/04/02	2002	2005					300,000	300,000	300,000	300,000	245,145	245,145
03/03/03	2003	2003			100,000	100,000	100,000	100,000	200,000	200,000	200,000	200,000
03/20/03	2003	2004				10,000	10,000	305,957	305,957	305,957	305,957	305,957
04/23/03	2003	2003			10,000	100,000	100,000	100,000	150,000	202,446	202,446	202,446
07/05/03	2003	2003			10,000	100,000	185,731	185,731	185,731	185,731	185,731	185,731
07/09/03	2003	2003			200,000	100,000	100,000	100,000	100,000	100,000	100,000	250,000
08/01/03	2003	2004				10,000	300,000	300,000	800,000	1,072,244	1,072,244	1,072,244
10/18/03	2003	2007							100,000	100,000	140,469	140,469
10/25/03	2003	2005					10,000	250,000	445,040	445,040	445,040	445,040
01/25/08	2008	2008								100,000	500,000	500,000
03/01/08	2008	2008								100,000	230,052	230,052
03/25/08	2008	2008								10,000	60,000	60,000
03/27/08	2008	2008								10,000	100,000	166,734
04/27/08	2008	2009									110,000	150,000
07/13/08	2008	2009									15,000	55,000
08/17/08	2008	2009									10,000	100,000
11/19/08	2008	2009									25,000	125,000
07/14/09	2009	2009									50,000	100,000
11/04/09	2009	2009									25,000	100,000
04/03/10	2010	2010										1,000,000

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Excess Loss Development Triangle - CARe case study data

Type	Accident Year
Range Min	100,000
Range Max	250,000

Accident Year	12	24	36	48	60	72	84	96	108	120
2001	-	-	-	100,000	150,000	302,740	352,740	352,740	352,740	352,740
2002	100,000	250,000	250,000	500,000	500,000	500,000	500,000	495,145	495,145	
2003	300,000	400,000	735,731	1,235,731	1,485,731	1,538,177	1,578,646	1,728,646		
2004	200,000	300,000	631,069	731,069	891,069	791,069	791,069			
2005	100,000	304,000	504,000	458,924	458,924	458,924				
2006	-	100,000	250,000	250,000	250,000					
2007	200,000	800,000	1,200,000	1,200,000						
2008	200,000	690,052	1,021,786							
2009	-	200,000								
2010	250,000									
	4,990,910	5,816,576	6,748,310							

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108
2001	-	-	-	1.500	2.018	1.165	1.000	1.000	1.000
2002	2.500	1.000	2.000	1.000	1.000	1.000	0.990	1.000	
2003	1.333	1.839	1.680	1.202	1.035	1.026	1.095		
2004	1.500	2.104	1.158	1.219	0.888	1.000			
2005	3.040	1.658	0.911	1.000	1.000				
2006	-	2.500	1.000	1.000					
2007	4.000	1.500	1.000						
2008	3.450	1.481							
2009	-								

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	Ult
Num	**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**	
Den	**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**	1.000
All Year ATU	6.703	2.593	1.606	1.281	1.123	1.090	1.060	1.000	1.000	
% Reported	14.9%	38.6%	62.3%	78.1%	89.0%	91.7%	94.4%	100.0%	100.0%	

Excess Loss Development Triangle - CARe case study data

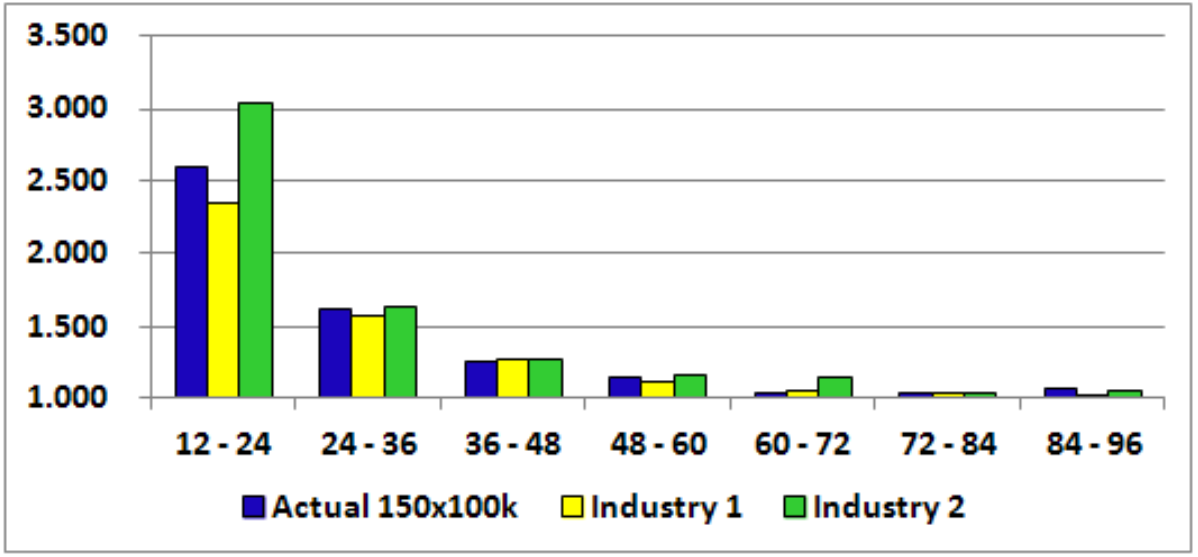
Type	Report Year
Range Min	100,000
Range Max	250,000

Report Year	12	24	36	48	60	72	84	96	108	120
2001	-	-	-	100,000	150,000	200,000	250,000	250,000	250,000	250,000
2002	100,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	
2003	300,000	400,000	485,731	485,731	635,731	688,177	688,177	838,177		
2004	200,000	450,000	1,033,809	1,083,809	1,143,809	1,143,809	1,143,809			
2005	450,000	1,004,000	1,054,000	1,054,000	1,049,145	1,049,145				
2006	-	200,000	154,924	154,924	154,924					
2007	400,000	1,050,000	990,469	990,469						
2008	400,000	1,180,052	1,246,786							
2009	110,000	575,000								
2010	250,000									
	4,990,910	5,816,576	6,748,310							

	24/12	36/24	48/36	60/48	72/60	84/72	96/84	108/96	120/108
2001	-	-	-	1.500	1.333	1.250	1.000	1.000	1.000
2002	2.500	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2003	1.333	1.214	1.000	1.309	1.082	1.000	1.218		
2004	2.250	2.297	1.048	1.055	1.000	1.000			
2005	2.231	1.050	1.000	0.995	1.000				
2006	-	0.775	1.000	1.000					
2007	2.625	0.943	1.000						
2008	2.950	1.057							
2009	5.227								

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120	Ult
Num	**4,534,052**	**5,215,720**	**4,118,934**	**3,383,609**	**3,331,131**	**2,331,986**	**1,338,177**	**500,000**	**250,000**	
Den	**1,850,000**	**4,534,052**	**3,968,934**	**3,128,464**	**3,228,685**	**2,281,986**	**1,188,177**	**500,000**	**250,000**	
All Year ATA	**2.451**	**1.150**	**1.038**	**1.082**	**1.032**	**1.022**	**1.126**	**1.000**	**1.000**	1.000
All Year ATU	3.758	1.533	1.333	1.284	1.187	1.151	1.126	1.000	1.000	
% Reported	26.6%	65.2%	75.0%	77.9%	84.2%	86.9%	88.8%	100.0%	100.0%	

Excess Loss Development Factors
Scaling Industry Benchmarks

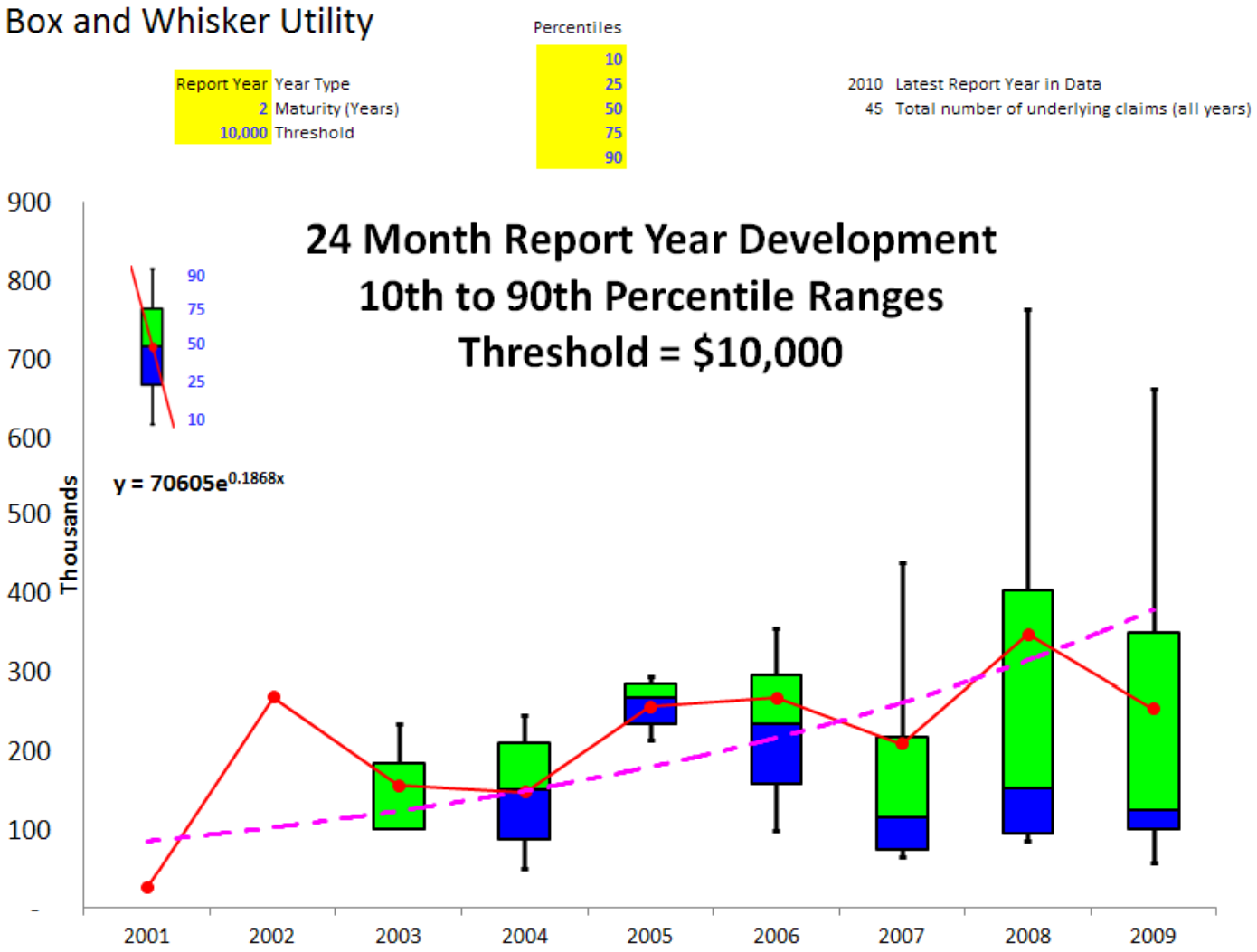


	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120
Numerator	2,844,052	4,592,587	4,475,724	3,735,724	3,590,910	3,222,456	2,576,531	847,885	352,740
Denominator	1,100,000	2,844,052	3,570,800	3,275,724	3,485,724	3,131,986	2,431,386	847,885	352,740
All Year ATA	**2.586**	**1.615**	**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**

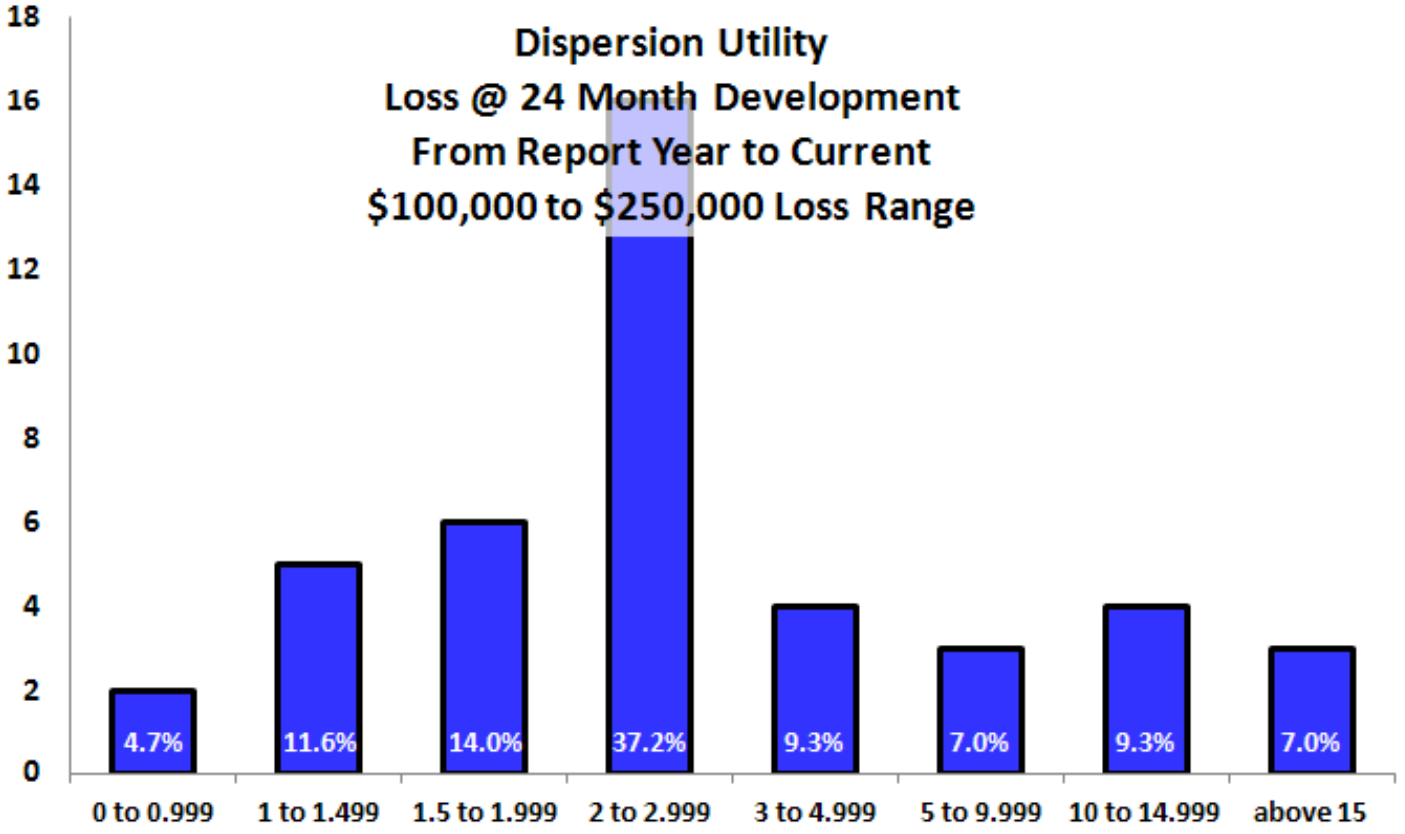
	Increase based on:		Indicated Scalar	
	All maturities	36:current	All maturities	36:current
Actual Increase (All numerators - denominators)	**5,198,310**	**1,705,724**		
Expected Increase - Industry 1	**4,743,694**	**1,627,149**	**1.10**	**1.05**
Expected Increase - Industry 2	**6,208,854**	**2,174,393**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

Excess Percentile Distributions
Case Study Sample



Excess Claim Dispersion
Case Study Indication



On the Path to Excess Loss Factors
Individual Claim at Ultimate 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 Perhaps
  - **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 Sarah

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.

Information Emergence

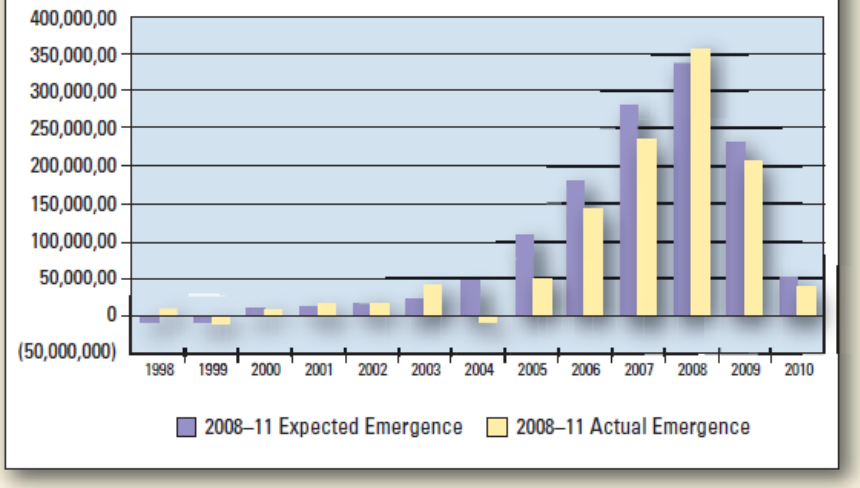
To help identify where we are in the underwriting cycle, it is important to perform "emergence testing." That is, the actuary should set up his total loss expectations for any individual contract, and specify how he expects those losses will be reported over each of the subsequent quarters or years.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

Questions ?