PENNSYLVANIA COMPENSATION RATING BUREAU

Retrospective Test of Trend Projections for Severity Ratios

Attached is a retrospective test of the predictive accuracy of various trend procedures. Please note that instead of using ultimate loss ratios, as in Exhibit 11a, Exhibit 11b uses ultimate severity ratios, i.e., ultimate loss ratios adjusted by dividing out the frequency component. Please note that our analysis is limited to Policy Years 1995 through 2006, the years shown on Exhibit 6, page 6.

Results for both indemnity and medical are shown using both linear and exponential fits. All possible combinations of from four to ten data points, which permitted a test of the projected severity ratio three years hence, were used. Our current review trends policy year 2006 3.25 years, policy year 2005 4.25 years, and policy year 2004 5.25 years. An average of those three values is then calculated.

Current estimates of policy year ultimate severity ratios are compared with predicted values based on trending through earlier years. The results are shown for three loss development approaches: incurred, paid to twentieth and the average of the incurred and paid to twentieth methods.

As an illustration, the incurred loss development approach generated an indemnity severity ratio of 0.8240 for policy year 2001. Fitting the loss ratios for policy years 1995 to 1998 using a straight line and projecting that to 2001 yielded a severity ratio of 0.6614, which understates our current estimate for 2001 by 0.1626 points.

Indemnity
Actual Ultimate Severity Ratios
Including Average of Paid and Incurred

INDEMNITY		Severity	Severity	Severity
	Policy	Ratio	Ratio	Ratio
	Year	(Avg Pd & Inc)	(Incur)	(Pd-20)
	1995	0.6824	0.6750	0.6898
	1996	0.5945	0.5836	0.6055
	1997	0.6654	0.6452	0.6856
	1998	0.6888	0.6681	0.7095
	1999	0.7751	0.7452	0.8049
	2000	0.8511	0.8161	0.8862
	2001	0.8692	0.8240	0.9143
	2002	0.8912	0.8492	0.9332
	2003	0.9112	0.8571	0.9652
	2004	0.9847	0.9347	1.0347
	2005	1.0006	0.9353	1.0659
	2006	1.0114	0.9438	1.0791

Trend # Years =   3

11b.1

Indemnity
Linear Fit
Trended Severity Ratios

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.6983	0.6614	0.7352
96-99 (4)	2002	0.9353	0.8890	0.9813
97-00 (4)	2003	1.0346	0.9841	1.0853
98-01 (4)	2004	1.0738	1.0057	1.1418
99-02 (4)	2005	1.0115	0.9526	1.0705
00-03 (4)	2006	0.9717	0.9033	1.0399
95-99 (5)	2002	0.8211	0.7759	0.8662
96-00 (5)	2003	1.0264	0.9741	1.0787
97-01 (5)	2004	1.0549	0.9925	1.1172
98-02 (5)	2005	1.0645	1.0010	1.1280
99-03 (5)	2006	1.0157	0.9468	1.0846
95-00 (6)	2003	0.9309	0.8795	0.9823
96-01 (6)	2004	1.0576	0.9953	1.1199
97-02 (6)	2005	1.0645	1.0029	1.1262
98-03 (6)	2006	1.0634	0.9921	1.1347
95-01 (7)	2004	0.9859	0.9250	1.0467
96-02 (7)	2005	1.0750	1.0121	1.1379
97-03 (7)	2006	1.0724	1.0029	1.1418
95-02 (8)	2005	1.0214	0.9588	1.0839
96-03 (8)	2006	1.0875	1.0173	1.1575
95-03 (9)	2006	1.0470	0.9773	1.1165

11b.2

Indemnity
Linear Fit
Differences: (Actual - Trended)

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.1709	0.1626	0.1791
96-99 (4)	2002	-0.0441	-0.0398	-0.0481
97-00 (4)	2003	-0.1234	-0.1270	-0.1201
98-01 (4)	2004	-0.0891	-0.0710	-0.1071
99-02 (4)	2005	-0.0109	-0.0173	-0.0046
00-03 (4)	2006	0.0397	0.0405	0.0392
95-99 (5)	2002	0.0701	0.0733	0.0670
96-00 (5)	2003	-0.1152	-0.1170	-0.1135
97-01 (5)	2004	-0.0702	-0.0578	-0.0825
98-02 (5)	2005	-0.0639	-0.0657	-0.0621
99-03 (5)	2006	-0.0043	-0.0030	-0.0055
95-00 (6)	2003	-0.0197	-0.0224	-0.0171
96-01 (6)	2004	-0.0729	-0.0606	-0.0852
97-02 (6)	2005	-0.0639	-0.0676	-0.0603
98-03 (6)	2006	-0.0520	-0.0483	-0.0556
95-01 (7)	2004	-0.0012	0.0097	-0.0120
96-02 (7)	2005	-0.0744	-0.0768	-0.0720
97-03 (7)	2006	-0.0610	-0.0591	-0.0627
95-02 (8)	2005	-0.0208	-0.0235	-0.0180
96-03 (8)	2006	-0.0761	-0.0735	-0.0784
95-03 (9)	2006	-0.0356	-0.0335	-0.0374

11b.3

Indemnity
Exponential Fit
Trended Loss Ratios

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Incur)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.6996	0.6623	0.7375
96-99 (4)	2002	0.9850	0.9297	1.0407
97-00 (4)	2003	1.0902	1.0322	1.1487
98-01 (4)	2004	1.1319	1.0518	1.2129
99-02 (4)	2005	1.0305	0.9676	1.0937
00-03 (4)	2006	0.9763	0.9058	1.0468
95-99 (5)	2002	0.8299	0.7812	0.8793
96-00 (5)	2003	1.0962	1.0324	1.1607
97-01 (5)	2004	1.1115	1.0389	1.1846
98-02 (5)	2005	1.1119	1.0393	1.1851
99-03 (5)	2006	1.0324	0.9589	1.1063
95-00 (6)	2003	0.9554	0.8971	1.0146
96-01 (6)	2004	1.1316	1.0553	1.2088
97-02 (6)	2005	1.1185	1.0475	1.1901
98-03 (6)	2006	1.1045	1.0238	1.1860
95-01 (7)	2004	1.0225	0.9520	1.0942
96-02 (7)	2005	1.1485	1.0721	1.2257
97-03 (7)	2006	1.1235	1.0435	1.2041
95-02 (8)	2005	1.0657	0.9924	1.1402
96-03 (8)	2006	1.1590	1.0743	1.2447
95-03 (9)	2006	1.0962	1.0142	1.1795

11b.4

Indemnity
Exponential Fit
Differences: (Actual - Trended)

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.1696	0.1617	0.1768
96-99 (4)	2002	-0.0938	-0.0805	-0.1075
97-00 (4)	2003	-0.1790	-0.1751	-0.1835
98-01 (4)	2004	-0.1472	-0.1171	-0.1782
99-02 (4)	2005	-0.0299	-0.0323	-0.0278
00-03 (4)	2006	0.0351	0.0380	0.0323
95-99 (5)	2002	0.0613	0.0680	0.0539
96-00 (5)	2003	-0.1850	-0.1753	-0.1955
97-01 (5)	2004	-0.1268	-0.1042	-0.1499
98-02 (5)	2005	-0.1113	-0.1040	-0.1192
99-03 (5)	2006	-0.0210	-0.0151	-0.0272
95-00 (6)	2003	-0.0442	-0.0400	-0.0494
96-01 (6)	2004	-0.1469	-0.1206	-0.1741
97-02 (6)	2005	-0.1179	-0.1122	-0.1242
98-03 (6)	2006	-0.0931	-0.0800	-0.1069
95-01 (7)	2004	-0.0378	-0.0173	-0.0595
96-02 (7)	2005	-0.1479	-0.1368	-0.1598
97-03 (7)	2006	-0.1121	-0.0997	-0.1250
95-02 (8)	2005	-0.0651	-0.0571	-0.0743
96-03 (8)	2006	-0.1476	-0.1305	-0.1656
95-03 (9)	2006	-0.0848	-0.0704	-0.1004

11b.5

Medical
Actual Ultimate Severity Ratios
Including Average of Paid and Incurred

MEDICAL Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
1995	0.5133	0.5135	0.5132
1996	0.5162	0.5197	0.5128
1997	0.5852	0.5853	0.5850
1998	0.6454	0.6597	0.6310
1999	0.6968	0.7033	0.6902
2000	0.7619	0.7722	0.7515
2001	0.7658	0.7539	0.7778
2002	0.8172	0.8171	0.8172
2003	0.8848	0.8750	0.8945
2004	1.0029	1.0005	1.0053
2005	1.0083	1.0120	1.0045
2006	1.0004	0.9855	1.0155

Trend # Years = 3

11b.6

Medical
Linear Fit
Trended Severity Ratios

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.7744	0.7964	0.7520
96-99 (4)	2002	0.8818	0.8983	0.8649
97-00 (4)	2003	0.9340	0.9521	0.9158
98-01 (4)	2004	0.9093	0.8805	0.9384
99-02 (4)	2005	0.9247	0.9070	0.9425
00-03 (4)	2006	0.9965	0.9718	1.0210
95-99 (5)	2002	0.8395	0.8561	0.8225
96-00 (5)	2003	0.9426	0.9595	0.9254
97-01 (5)	2004	0.9299	0.9197	0.9402
98-02 (5)	2005	0.9437	0.9239	0.9635
99-03 (5)	2006	1.0010	0.9785	1.0234
95-00 (6)	2003	0.9097	0.9271	0.8920
96-01 (6)	2004	0.9494	0.9447	0.9541
97-02 (6)	2005	0.9613	0.9526	0.9701
98-03 (6)	2006	1.0075	0.9835	1.0314
95-01 (7)	2004	0.9322	0.9320	0.9323
96-02 (7)	2005	0.9799	0.9749	0.9849
97-03 (7)	2006	1.0177	1.0026	1.0329
95-02 (8)	2005	0.9689	0.9674	0.9703
96-03 (8)	2006	1.0316	1.0201	1.0429
95-03 (9)	2006	1.0218	1.0141	1.0294

11b.7

Medical
Linear Fit
Differences: (Actual - Trended)

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	-0.0086	-0.0425	0.0258
96-99 (4)	2002	-0.0646	-0.0812	-0.0477
97-00 (4)	2003	-0.0492	-0.0771	-0.0213
98-01 (4)	2004	0.0936	0.1201	0.0669
99-02 (4)	2005	0.0836	0.1050	0.0620
00-03 (4)	2006	0.0039	0.0137	-0.0055
95-99 (5)	2002	-0.0223	-0.0390	-0.0053
96-00 (5)	2003	-0.0578	-0.0845	-0.0309
97-01 (5)	2004	0.0730	0.0808	0.0652
98-02 (5)	2005	0.0646	0.0881	0.0410
99-03 (5)	2006	-0.0006	0.0071	-0.0079
95-00 (6)	2003	-0.0249	-0.0521	0.0025
96-01 (6)	2004	0.0535	0.0558	0.0512
97-02 (6)	2005	0.0470	0.0594	0.0344
98-03 (6)	2006	-0.0071	0.0020	-0.0159
95-01 (7)	2004	0.0707	0.0685	0.0730
96-02 (7)	2005	0.0284	0.0371	0.0196
97-03 (7)	2006	-0.0173	-0.0171	-0.0174
95-02 (8)	2005	0.0394	0.0446	0.0342
96-03 (8)	2006	-0.0312	-0.0346	-0.0274
95-03 (9)	2006	-0.0214	-0.0286	-0.0139

11b.8

Medical
Exponential Fit
Trended Loss Ratios

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	0.8107	0.8383	0.7830
96-99 (4)	2002	0.9512	0.9731	0.9290
97-00 (4)	2003	0.9890	1.0125	0.9658
98-01 (4)	2004	0.9386	0.9003	0.9788
99-02 (4)	2005	0.9436	0.9212	0.9667
00-03 (4)	2006	1.0155	0.9859	1.0458
95-99 (5)	2002	0.8911	0.9129	0.8690
96-00 (5)	2003	1.0232	1.0455	1.0007
97-01 (5)	2004	0.9775	0.9636	0.9914
98-02 (5)	2005	0.9756	0.9479	1.0043
99-03 (5)	2006	1.0295	1.0010	1.0586
95-00 (6)	2003	0.9782	1.0015	0.9547
96-01 (6)	2004	1.0241	1.0166	1.0313
97-02 (6)	2005	1.0112	0.9987	1.0239
98-03 (6)	2006	1.0479	1.0149	1.0822
95-01 (7)	2004	1.0040	1.0037	1.0038
96-02 (7)	2005	1.0567	1.0484	1.0648
97-03 (7)	2006	1.0759	1.0551	1.0970
95-02 (8)	2005	1.0473	1.0449	1.0493
96-03 (8)	2006	1.1166	1.0998	1.1333
95-03 (9)	2006	1.1109	1.1002	1.1213

11b.9

Medical
Exponential Fit
Differences: (Actual - Trended)

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
95-98 (4)	2001	-0.0449	-0.0844	-0.0052
96-99 (4)	2002	-0.1340	-0.1560	-0.1118
97-00 (4)	2003	-0.1042	-0.1375	-0.0713
98-01 (4)	2004	0.0643	0.1002	0.0265
99-02 (4)	2005	0.0647	0.0908	0.0378
00-03 (4)	2006	-0.0151	-0.0004	-0.0303
95-99 (5)	2002	-0.0739	-0.0958	-0.0518
96-00 (5)	2003	-0.1384	-0.1705	-0.1062
97-01 (5)	2004	0.0254	0.0369	0.0139
98-02 (5)	2005	0.0327	0.0641	0.0002
99-03 (5)	2006	-0.0291	-0.0155	-0.0431
95-00 (6)	2003	-0.0934	-0.1265	-0.0602
96-01 (6)	2004	-0.0212	-0.0161	-0.0260
97-02 (6)	2005	-0.0029	0.0133	-0.0194
98-03 (6)	2006	-0.0475	-0.0294	-0.0667
95-01 (7)	2004	-0.0011	-0.0032	0.0015
96-02 (7)	2005	-0.0484	-0.0364	-0.0603
97-03 (7)	2006	-0.0755	-0.0696	-0.0815
95-02 (8)	2005	-0.0390	-0.0329	-0.0448
96-03 (8)	2006	-0.1162	-0.1143	-0.1178
95-03 (9)	2006	-0.1105	-0.1147	-0.1058

11b.10