

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 1988 through 1999, the years for which frequency data is available.

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 1999 3.25 years, policy year 1998 4.25 years, and policy year 1997 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 available for each of twenty-one loss development approaches - incurred and paid-to-2nd through paid-to-20th, as well as the average of the incurred and paid-to-20<sup>th</sup> methods, although the paid-to-9<sup>th</sup>, paid-to-11<sup>th</sup>, paid-to-13<sup>th</sup>, paid-to-15<sup>th</sup>, paid-to-17<sup>th</sup> and paid-to-19<sup>th</sup> approaches are not shown.

As an illustration, the incurred loss development approach generated an indemnity severity ratio of 0.9160 for policy year 1996. Fitting the loss ratios for policy years 1990 to 1993 using a straight line and projecting that to 1996 yielded a loss ratio of 0.9603 which overstates our current estimate for 1996 by 0.0443 points.

**Indemnity**  
**Actual Ultimate Severity Ratios**  
**Including Average of Paid and Incurred**

INDEMNITY	Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
	1988	0.6568	0.6283	0.6283	0.6283	0.6283	0.6283	0.6283	0.6283	0.6283	0.6283	0.6283	0.6512	0.6578	0.6705	0.6852
	1989	0.7715	0.7331	0.7331	0.7331	0.7331	0.7331	0.7331	0.7331	0.7331	0.7331	0.7439	0.7697	0.7776	0.7926	0.8099
	1990	0.8078	0.7659	0.7659	0.7659	0.7659	0.7659	0.7659	0.7659	0.7659	0.7659	0.7803	0.8076	0.8157	0.8315	0.8496
	1991	0.8561	0.8098	0.8098	0.8098	0.8098	0.8098	0.8098	0.8098	0.8098	0.8137	0.8287	0.8576	0.8662	0.8830	0.9023
	1992	0.8385	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7980	0.7927	0.8073	0.8354	0.8438	0.8601	0.8789
	1993	0.8957	0.8410	0.8410	0.8410	0.8410	0.8410	0.8410	0.8410	0.8554	0.8570	0.8727	0.9031	0.9122	0.9299	0.9503
	1994	0.9738	0.9017	0.9017	0.9017	0.9017	0.9017	0.9017	0.9366	0.9414	0.9432	0.9606	0.9940	1.0040	1.0235	1.0458
	1995	1.0005	0.9007	0.9007	0.9007	0.9007	0.9007	0.9550	0.9853	0.9903	0.9921	1.0104	1.0457	1.0562	1.0766	1.1002
	1996	0.9160	0.8012	0.8012	0.8012	0.8012	0.8609	0.8947	0.9232	0.9278	0.9295	0.9466	0.9796	0.9895	1.0086	1.0307
	1997	1.0524	0.9108	0.9108	0.9108	0.9483	0.9974	1.0365	1.0693	1.0748	1.0768	1.0967	1.1348	1.1463	1.1684	1.1940
	1998	1.0438	0.9034	0.9034	0.9092	0.9404	0.9893	1.0280	1.0605	1.0660	1.0679	1.0876	1.1254	1.1369	1.1587	1.1841
	1999	1.1255	0.9531	0.9917	0.9964	1.0307	1.0841	1.1267	1.1624	1.1682	1.1705	1.1920	1.2335	1.2461	1.2701	1.2979

Trend # Years = 3

**Indemnity  
Linear Fit  
Trended Severity Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	1.0584	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	1.0003	1.0322	1.0672	1.0778	1.0988	1.1227
89-92 (4)	1995	0.9307	0.8841	0.8841	0.8841	0.8841	0.8841	0.8841	0.8841	0.8841	0.8783	0.8974	0.9288	0.9379	0.9561	0.9770
90-93 (4)	1996	0.9603	0.8998	0.8998	0.8998	0.8998	0.8998	0.8998	0.8998	0.8998	0.9228	0.9209	0.9374	0.9699	0.9797	0.9987
91-94 (4)	1997	1.0757	0.9810	0.9810	0.9810	0.9810	0.9810	0.9810	0.9810	1.0369	1.0546	1.0554	1.0748	1.1121	1.1234	1.1452
92-95 (4)	1998	1.1810	1.0263	1.0263	1.0263	1.0263	1.0263	1.1132	1.1861	1.1946	1.2042	1.2265	1.2694	1.2821	1.3069	1.3355
93-96 (4)	1999	0.9859	0.8070	0.8070	0.8070	0.8070	0.9025	0.9946	1.0544	1.0485	1.0503	1.0698	1.1071	1.1183	1.1398	1.1648
88-92 (5)	1995	1.0101	0.9551	0.9551	0.9551	0.9551	0.9551	0.9551	0.9551	0.9551	0.9514	0.9791	1.0125	1.0225	1.0423	1.0651
89-93 (5)	1996	0.9735	0.9135	0.9135	0.9135	0.9135	0.9135	0.9135	0.9135	0.9135	0.9308	0.9298	0.9489	0.9820	0.9918	1.0110
90-94 (5)	1997	1.0602	0.9747	0.9747	0.9747	0.9747	0.9747	0.9747	1.0166	1.0324	1.0335	1.0522	1.0887	1.0997	1.1211	1.1456
91-95 (5)	1998	1.1250	0.9930	0.9930	0.9930	0.9930	0.9930	1.0582	1.1189	1.1312	1.1334	1.1543	1.1946	1.2066	1.2299	1.2569
92-96 (5)	1999	1.0548	0.8816	0.8816	0.8816	0.8816	0.9532	1.0318	1.0942	1.0998	1.1073	1.1277	1.1671	1.1788	1.2016	1.2279
88-93 (6)	1996	1.0313	0.9673	0.9673	0.9673	0.9673	0.9673	0.9673	0.9673	0.9810	0.9804	1.0064	1.0409	1.0512	1.0717	1.0951
89-94 (6)	1997	1.0549	0.9743	0.9743	0.9743	0.9743	0.9743	0.9743	1.0075	1.0213	1.0223	1.0427	1.0790	1.0898	1.1110	1.1353
90-95 (6)	1998	1.1113	0.9922	0.9922	0.9922	0.9922	0.9922	1.0439	1.0950	1.1075	1.1096	1.1299	1.1693	1.1810	1.2039	1.2303
91-96 (6)	1999	1.0491	0.8933	0.8933	0.8933	0.8933	0.9501	1.0170	1.0747	1.0840	1.0866	1.1066	1.1452	1.1568	1.1791	1.2049
88-94 (7)	1997	1.0922	1.0114	1.0114	1.0114	1.0114	1.0114	1.0114	1.0388	1.0508	1.0518	1.0777	1.1147	1.1259	1.1478	1.1728
89-95 (7)	1998	1.1045	0.9941	0.9941	0.9941	0.9941	0.9941	1.0368	1.0805	1.0923	1.0943	1.1157	1.1547	1.1662	1.1888	1.2149
90-96 (7)	1999	1.0588	0.9151	0.9151	0.9151	0.9151	0.9620	1.0196	1.0717	1.0820	1.0845	1.1043	1.1427	1.1543	1.1766	1.2024
88-95 (8)	1998	1.1336	1.0266	1.0266	1.0266	1.0266	1.0266	1.0628	1.1009	1.1118	1.1136	1.1396	1.1790	1.1908	1.2138	1.2404
89-96 (8)	1999	1.0671	0.9326	0.9326	0.9326	0.9326	0.9724	1.0228	1.0697	1.0800	1.0823	1.1033	1.1418	1.1533	1.1756	1.2014
88-96 (9)	1999	1.1019	0.9724	0.9724	0.9724	0.9724	1.0069	1.0515	1.0939	1.1038	1.1060	1.1311	1.1702	1.1819	1.2048	1.2312

**Indemnity  
Linear Fit  
Differences: (Actual - Trended)**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	-0.0846	-0.0924	-0.0924	-0.0924	-0.0924	-0.0924	-0.0924	-0.0575	-0.0527	-0.0571	-0.0716	-0.0732	-0.0738	-0.0753	-0.0769
89-92 (4)	1995	0.0698	0.0166	0.0166	0.0166	0.0166	0.0166	0.0709	0.1012	0.1062	0.1138	0.1130	0.1169	0.1183	0.1205	0.1232
90-93 (4)	1996	-0.0443	-0.0986	-0.0986	-0.0986	-0.0986	-0.0389	-0.0051	0.0234	0.0050	0.0086	0.0092	0.0097	0.0098	0.0099	0.0100
91-94 (4)	1997	-0.0233	-0.0702	-0.0702	-0.0702	-0.0327	0.0164	0.0555	0.0324	0.0202	0.0214	0.0219	0.0227	0.0229	0.0232	0.0238
92-95 (4)	1998	-0.1372	-0.1229	-0.1229	-0.1171	-0.0859	-0.0370	-0.0852	-0.1256	-0.1286	-0.1363	-0.1389	-0.1440	-0.1452	-0.1482	-0.1514
93-96 (4)	1999	0.1396	0.1461	0.1847	0.1894	0.2237	0.1816	0.1321	0.1080	0.1197	0.1202	0.1223	0.1264	0.1278	0.1303	0.1331
88-92 (5)	1995	-0.0096	-0.0544	-0.0544	-0.0544	-0.0544	-0.0544	-0.0001	0.0302	0.0352	0.0407	0.0313	0.0333	0.0337	0.0343	0.0351
89-93 (5)	1996	-0.0575	-0.1123	-0.1123	-0.1123	-0.1123	-0.0526	-0.0188	0.0097	-0.0030	-0.0003	-0.0023	-0.0024	-0.0022	-0.0024	-0.0025
90-94 (5)	1997	-0.0078	-0.0639	-0.0639	-0.0639	-0.0264	0.0227	0.0618	0.0527	0.0424	0.0433	0.0445	0.0461	0.0466	0.0474	0.0484
91-95 (5)	1998	-0.0812	-0.0896	-0.0896	-0.0838	-0.0526	-0.0037	-0.0301	-0.0584	-0.0652	-0.0655	-0.0667	-0.0692	-0.0697	-0.0712	-0.0727
92-96 (5)	1999	0.0707	0.0715	0.1101	0.1148	0.1491	0.1309	0.0949	0.0682	0.0684	0.0633	0.0643	0.0664	0.0673	0.0685	0.0700
88-93 (6)	1996	-0.1153	-0.1661	-0.1661	-0.1661	-0.1661	-0.1064	-0.0726	-0.0441	-0.0532	-0.0509	-0.0598	-0.0613	-0.0617	-0.0631	-0.0644
89-94 (6)	1997	-0.0025	-0.0635	-0.0635	-0.0635	-0.0260	0.0231	0.0622	0.0618	0.0535	0.0545	0.0540	0.0558	0.0565	0.0574	0.0587
90-95 (6)	1998	-0.0675	-0.0888	-0.0888	-0.0830	-0.0518	-0.0029	-0.0159	-0.0345	-0.0415	-0.0417	-0.0423	-0.0439	-0.0441	-0.0452	-0.0462
91-96 (6)	1999	0.0764	0.0598	0.0984	0.1031	0.1374	0.1340	0.1097	0.0877	0.0842	0.0839	0.0854	0.0883	0.0893	0.0910	0.0930
88-94 (7)	1997	-0.0398	-0.1006	-0.1006	-0.1006	-0.0631	-0.0140	0.0251	0.0305	0.0240	0.0250	0.0190	0.0201	0.0204	0.0206	0.0212
89-95 (7)	1998	-0.0607	-0.0907	-0.0907	-0.0849	-0.0537	-0.0048	-0.0087	-0.0200	-0.0263	-0.0264	-0.0281	-0.0293	-0.0293	-0.0301	-0.0307
90-96 (7)	1999	0.0667	0.0380	0.0766	0.0813	0.1156	0.1221	0.1072	0.0907	0.0862	0.0860	0.0877	0.0908	0.0918	0.0935	0.0955
88-95 (8)	1998	-0.0898	-0.1232	-0.1232	-0.1174	-0.0862	-0.0373	-0.0348	-0.0404	-0.0458	-0.0457	-0.0520	-0.0536	-0.0539	-0.0551	-0.0563
89-96 (8)	1999	0.0584	0.0205	0.0591	0.0638	0.0981	0.1117	0.1039	0.0927	0.0882	0.0882	0.0887	0.0917	0.0928	0.0945	0.0965
88-96 (9)	1999	0.0236	-0.0193	0.0193	0.0240	0.0583	0.0772	0.0752	0.0685	0.0644	0.0645	0.0609	0.0633	0.0642	0.0653	0.0667

**Indemnity  
Exponential Fit  
Trended Loss Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Incur)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	1.1233	1.0503	1.0503	1.0503	1.0503	1.0503	1.0503	1.0503	1.0503	1.0584	1.1009	1.1375	1.1487	1.1711	1.1965
89-92 (4)	1995	0.9394	0.8924	0.8924	0.8924	0.8924	0.8924	0.8924	0.8924	0.8924	0.8859	0.9058	0.9374	0.9466	0.9650	0.9861
90-93 (4)	1996	0.9669	0.9053	0.9053	0.9053	0.9053	0.9053	0.9053	0.9053	0.9303	0.9278	0.9444	0.9771	0.9870	1.0061	1.0283
91-94 (4)	1997	1.0904	0.9905	0.9905	0.9905	0.9905	0.9905	0.9905	0.9905	1.0525	1.0738	1.0743	1.0940	1.1320	1.1434	1.1657
92-95 (4)	1998	1.2190	1.0440	1.0440	1.0440	1.0440	1.0440	1.1465	1.2378	1.2480	1.2621	1.2855	1.3304	1.3438	1.3698	1.3998
93-96 (4)	1999	0.9865	0.8052	0.8052	0.8052	0.8052	0.9033	1.0009	1.0675	1.0588	1.0607	1.0803	1.1181	1.1294	1.1510	1.1763
88-92 (5)	1995	1.0527	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9932	0.9886	1.0228	1.0572	1.0676	1.0883	1.1121
89-93 (5)	1996	0.9851	0.9235	0.9235	0.9235	0.9235	0.9235	0.9235	0.9235	0.9425	0.9412	0.9611	0.9946	1.0045	1.0240	1.0465
90-94 (5)	1997	1.0759	0.9862	0.9862	0.9862	0.9862	0.9862	0.9862	1.0322	1.0510	1.0519	1.0709	1.1079	1.1191	1.1409	1.1659
91-95 (5)	1998	1.1470	1.0039	1.0039	1.0039	1.0039	1.0039	1.0770	1.1482	1.1633	1.1657	1.1872	1.2286	1.2410	1.2650	1.2927
92-96 (5)	1999	1.0658	0.8804	0.8804	0.8804	0.8804	0.9597	1.0471	1.1198	1.1259	1.1356	1.1566	1.1970	1.2091	1.2324	1.2594
88-93 (6)	1996	1.0721	1.0026	1.0026	1.0026	1.0026	1.0026	1.0026	1.0026	1.0189	1.0180	1.0496	1.0851	1.0959	1.1172	1.1417
89-94 (6)	1997	1.0742	0.9894	0.9894	0.9894	0.9894	0.9894	0.9894	1.0259	1.0421	1.0430	1.0645	1.1015	1.1125	1.1342	1.1590
90-95 (6)	1998	1.1339	1.0056	1.0056	1.0056	1.0056	1.0056	1.0632	1.1222	1.1375	1.1398	1.1606	1.2009	1.2130	1.2365	1.2637
91-96 (6)	1999	1.0586	0.8926	0.8926	0.8926	0.8926	0.9558	1.0293	1.0952	1.1060	1.1089	1.1293	1.1687	1.1805	1.2033	1.2297
88-94 (7)	1997	1.1396	1.0504	1.0504	1.0504	1.0504	1.0504	1.0504	1.0822	1.0971	1.0981	1.1297	1.1681	1.1797	1.2027	1.2290
89-95 (7)	1998	1.1303	1.0112	1.0112	1.0112	1.0112	1.0112	1.0588	1.1089	1.1234	1.1255	1.1482	1.1883	1.2001	1.2234	1.2502
90-96 (7)	1999	1.0723	0.9177	0.9177	0.9177	0.9177	0.9710	1.0349	1.0946	1.1067	1.1095	1.1298	1.1691	1.1809	1.2037	1.2301
88-95 (8)	1998	1.1857	1.0653	1.0653	1.0653	1.0653	1.0653	1.1077	1.1532	1.1672	1.1692	1.2010	1.2421	1.2544	1.2788	1.3068
89-96 (8)	1999	1.0857	0.9397	0.9397	0.9397	0.9397	0.9858	1.0422	1.0961	1.1084	1.1111	1.1331	1.1727	1.1844	1.2073	1.2338
88-96 (9)	1999	1.1435	0.9967	0.9967	0.9967	0.9967	1.0390	1.0914	1.1424	1.1548	1.1574	1.1873	1.2281	1.2404	1.2644	1.2921

**Indemnity  
Exponential Fit  
Differences: (Actual - Trended)**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	-0.1495	-0.1486	-0.1486	-0.1486	-0.1486	-0.1486	-0.1486	-0.1137	-0.1089	-0.1152	-0.1403	-0.1435	-0.1447	-0.1476	-0.1507
89-92 (4)	1995	0.0611	0.0083	0.0083	0.0083	0.0083	0.0083	0.0626	0.0929	0.0979	0.1062	0.1046	0.1083	0.1096	0.1116	0.1141
90-93 (4)	1996	-0.0509	-0.1041	-0.1041	-0.1041	-0.1041	-0.0444	-0.0106	0.0179	-0.0025	0.0017	0.0022	0.0025	0.0025	0.0025	0.0024
91-94 (4)	1997	-0.0380	-0.0797	-0.0797	-0.0797	-0.0422	0.0069	0.0460	0.0168	0.0010	0.0025	0.0027	0.0028	0.0029	0.0027	0.0029
92-95 (4)	1998	-0.1752	-0.1406	-0.1406	-0.1348	-0.1036	-0.0547	-0.1185	-0.1773	-0.1820	-0.1942	-0.1979	-0.2050	-0.2069	-0.2111	-0.2157
93-96 (4)	1999	0.1390	0.1479	0.1865	0.1912	0.2255	0.1808	0.1258	0.0949	0.1094	0.1098	0.1117	0.1154	0.1167	0.1191	0.1216
88-92 (5)	1995	-0.0522	-0.0925	-0.0925	-0.0925	-0.0925	-0.0925	-0.0382	-0.0079	-0.0029	0.0035	-0.0124	-0.0115	-0.0114	-0.0117	-0.0119
89-93 (5)	1996	-0.0691	-0.1223	-0.1223	-0.1223	-0.1223	-0.0626	-0.0288	-0.0003	-0.0147	-0.0117	-0.0145	-0.0150	-0.0150	-0.0154	-0.0158
90-94 (5)	1997	-0.0235	-0.0754	-0.0754	-0.0754	-0.0379	0.0112	0.0503	0.0371	0.0238	0.0249	0.0258	0.0269	0.0272	0.0275	0.0281
91-95 (5)	1998	-0.1032	-0.1005	-0.1005	-0.0947	-0.0635	-0.0146	-0.0490	-0.0877	-0.0973	-0.0978	-0.0996	-0.1032	-0.1041	-0.1063	-0.1086
92-96 (5)	1999	0.0597	0.0727	0.1113	0.1160	0.1503	0.1244	0.0796	0.0426	0.0423	0.0349	0.0354	0.0365	0.0370	0.0377	0.0385
88-93 (6)	1996	-0.1561	-0.2014	-0.2014	-0.2014	-0.2014	-0.1417	-0.1079	-0.0794	-0.0911	-0.0885	-0.1030	-0.1055	-0.1064	-0.1086	-0.1110
89-94 (6)	1997	-0.0218	-0.0786	-0.0786	-0.0786	-0.0411	0.0080	0.0471	0.0434	0.0327	0.0338	0.0322	0.0333	0.0338	0.0342	0.0350
90-95 (6)	1998	-0.0901	-0.1022	-0.1022	-0.0964	-0.0652	-0.0163	-0.0352	-0.0617	-0.0715	-0.0719	-0.0730	-0.0755	-0.0761	-0.0778	-0.0796
91-96 (6)	1999	0.0669	0.0605	0.0991	0.1038	0.1381	0.1283	0.0974	0.0672	0.0622	0.0616	0.0627	0.0648	0.0656	0.0668	0.0682
88-94 (7)	1997	-0.0872	-0.1396	-0.1396	-0.1396	-0.1021	-0.0530	-0.0139	-0.0129	-0.0223	-0.0213	-0.0330	-0.0333	-0.0334	-0.0343	-0.0350
89-95 (7)	1998	-0.0865	-0.1078	-0.1078	-0.1020	-0.0708	-0.0219	-0.0308	-0.0484	-0.0574	-0.0576	-0.0606	-0.0629	-0.0632	-0.0647	-0.0661
90-96 (7)	1999	0.0532	0.0354	0.0740	0.0787	0.1130	0.1131	0.0918	0.0678	0.0615	0.0610	0.0622	0.0644	0.0652	0.0664	0.0678
88-95 (8)	1998	-0.1419	-0.1619	-0.1619	-0.1561	-0.1249	-0.0760	-0.0797	-0.0927	-0.1012	-0.1013	-0.1134	-0.1167	-0.1175	-0.1201	-0.1227
89-96 (8)	1999	0.0398	0.0134	0.0520	0.0567	0.0910	0.0983	0.0845	0.0663	0.0598	0.0594	0.0589	0.0608	0.0617	0.0628	0.0641
88-96 (9)	1999	-0.0180	-0.0436	-0.0050	-0.0003	0.0340	0.0451	0.0353	0.0200	0.0134	0.0131	0.0047	0.0054	0.0057	0.0057	0.0058

**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-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
	1988	0.3645	0.3489	0.3489	0.3489	0.3489	0.3489	0.3489	0.3489	0.3489	0.3489	0.3489	0.3685	0.3637	0.3713	0.3801
	1989	0.4520	0.4335	0.4335	0.4335	0.4335	0.4335	0.4335	0.4335	0.4335	0.4335	0.4379	0.4560	0.4502	0.4594	0.4704
	1990	0.4988	0.4751	0.4751	0.4751	0.4751	0.4751	0.4751	0.4751	0.4751	0.4751	0.4864	0.5066	0.5000	0.5103	0.5225
	1991	0.5642	0.5364	0.5364	0.5364	0.5364	0.5364	0.5364	0.5364	0.5364	0.5406	0.5509	0.5738	0.5663	0.5781	0.5919
	1992	0.5862	0.5561	0.5561	0.5561	0.5561	0.5561	0.5561	0.5561	0.5561	0.5628	0.5736	0.5975	0.5897	0.6019	0.6163
	1993	0.6217	0.5857	0.5857	0.5857	0.5857	0.5857	0.5857	0.5857	0.5925	0.6007	0.6121	0.6376	0.6293	0.6424	0.6577
	1994	0.6698	0.6271	0.6271	0.6271	0.6271	0.6271	0.6271	0.6382	0.6418	0.6506	0.6629	0.6906	0.6816	0.6957	0.7124
	1995	0.7465	0.6977	0.6977	0.6977	0.6977	0.6977	0.7035	0.7125	0.7166	0.7264	0.7403	0.7711	0.7610	0.7769	0.7953
	1996	0.7737	0.7268	0.7268	0.7268	0.7268	0.7191	0.7256	0.7350	0.7391	0.7493	0.7637	0.7954	0.7850	0.8013	0.8205
	1997	0.9011	0.8437	0.8437	0.8437	0.8431	0.8401	0.8478	0.8587	0.8634	0.8754	0.8920	0.9293	0.9171	0.9362	0.9585
	1998	0.9401	0.8951	0.8951	0.8656	0.8667	0.8635	0.8714	0.8827	0.8876	0.8998	0.9169	0.9551	0.9425	0.9622	0.9850
	1999	0.9627	0.8997	0.9136	0.9013	0.9024	0.8991	0.9074	0.9190	0.9240	0.9367	0.9547	0.9944	0.9814	1.0018	1.0256

Trend # Years = 3

**Medical  
Linear Fit  
Trended Severity Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	0.7605	0.7203	0.7203	0.7203	0.7203	0.7203	0.7203	0.7203	0.7203	0.7270	0.7506	0.7761	0.7660	0.7819	0.8006
89-92 (4)	1995	0.7359	0.6934	0.6934	0.6934	0.6934	0.6934	0.6934	0.6934	0.6934	0.7070	0.7244	0.7547	0.7447	0.7603	0.7785
90-93 (4)	1996	0.7435	0.6965	0.6965	0.6965	0.6965	0.6965	0.6965	0.6965	0.7074	0.7244	0.7357	0.7664	0.7564	0.7722	0.7906
91-94 (4)	1997	0.7690	0.7121	0.7121	0.7121	0.7121	0.7121	0.7121	0.7299	0.7404	0.7542	0.7684	0.8006	0.7902	0.8065	0.8259
92-95 (4)	1998	0.8941	0.8264	0.8264	0.8264	0.8264	0.8264	0.8357	0.8579	0.8656	0.8784	0.8951	0.9324	0.9202	0.9395	0.9617
93-96 (4)	1999	0.9426	0.8816	0.8816	0.8816	0.8816	0.8693	0.8837	0.9028	0.9041	0.9165	0.9342	0.9729	0.9602	0.9801	1.0036
88-92 (5)	1995	0.7709	0.7286	0.7286	0.7286	0.7286	0.7286	0.7286	0.7286	0.7286	0.7396	0.7607	0.7884	0.7780	0.7942	0.8132
89-93 (5)	1996	0.7580	0.7101	0.7101	0.7101	0.7101	0.7101	0.7101	0.7101	0.7182	0.7336	0.7500	0.7813	0.7710	0.7872	0.8060
90-94 (5)	1997	0.7879	0.7327	0.7327	0.7327	0.7327	0.7327	0.7327	0.7461	0.7551	0.7715	0.7843	0.8171	0.8065	0.8232	0.8430
91-95 (5)	1998	0.8618	0.7974	0.7974	0.7974	0.7974	0.7974	0.8044	0.8229	0.8317	0.8459	0.8620	0.8980	0.8862	0.9047	0.9262
92-96 (5)	1999	0.9295	0.8654	0.8654	0.8654	0.8654	0.8561	0.8680	0.8878	0.8943	0.9073	0.9247	0.9631	0.9505	0.9703	0.9934
88-93 (6)	1996	0.7902	0.7428	0.7428	0.7428	0.7428	0.7428	0.7428	0.7428	0.7492	0.7627	0.7825	0.8120	0.8014	0.8181	0.8376
89-94 (6)	1997	0.7980	0.7430	0.7430	0.7430	0.7430	0.7430	0.7430	0.7536	0.7613	0.7772	0.7936	0.8268	0.8160	0.8330	0.8529
90-95 (6)	1998	0.8645	0.8020	0.8020	0.8020	0.8020	0.8020	0.8075	0.8232	0.8316	0.8480	0.8627	0.8987	0.8870	0.9055	0.9270
91-96 (6)	1999	0.9081	0.8445	0.8445	0.8445	0.8445	0.8372	0.8471	0.8653	0.8731	0.8873	0.9044	0.9419	0.9296	0.9490	0.9716
88-94 (7)	1997	0.8245	0.7704	0.7704	0.7704	0.7704	0.7704	0.7704	0.7791	0.7858	0.8004	0.8199	0.8516	0.8405	0.8579	0.8785
89-95 (7)	1998	0.8662	0.8044	0.8044	0.8044	0.8044	0.8044	0.8089	0.8223	0.8300	0.8463	0.8637	0.8998	0.8880	0.9066	0.9281
90-96 (7)	1999	0.9100	0.8469	0.8469	0.8469	0.8469	0.8408	0.8492	0.8657	0.8735	0.8898	0.9057	0.9434	0.9311	0.9505	0.9731
88-95 (8)	1998	0.8844	0.8236	0.8236	0.8236	0.8236	0.8236	0.8275	0.8391	0.8462	0.8617	0.8816	0.9163	0.9043	0.9231	0.9451
89-96 (8)	1999	0.9115	0.8481	0.8481	0.8481	0.8481	0.8430	0.8503	0.8651	0.8726	0.8891	0.9072	0.9450	0.9326	0.9520	0.9747
88-96 (9)	1999	0.9270	0.8642	0.8642	0.8642	0.8642	0.8597	0.8662	0.8796	0.8866	0.9027	0.9229	0.9596	0.9470	0.9667	0.9898



**Medical**  
**Linear Fit**  
**Differences: (Actual - Trended)**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	-0.0907	-0.0932	-0.0932	-0.0932	-0.0932	-0.0932	-0.0932	-0.0821	-0.0785	-0.0764	-0.0876	-0.0855	-0.0844	-0.0862	-0.0882
89-92 (4)	1995	0.0106	0.0043	0.0043	0.0043	0.0043	0.0043	0.0101	0.0191	0.0232	0.0194	0.0159	0.0164	0.0163	0.0166	0.0168
90-93 (4)	1996	0.0302	0.0303	0.0303	0.0303	0.0303	0.0226	0.0291	0.0385	0.0317	0.0249	0.0280	0.0290	0.0286	0.0291	0.0299
91-94 (4)	1997	0.1321	0.1316	0.1316	0.1316	0.1310	0.1280	0.1357	0.1289	0.1230	0.1212	0.1236	0.1287	0.1269	0.1297	0.1326
92-95 (4)	1998	0.0460	0.0687	0.0687	0.0392	0.0403	0.0371	0.0357	0.0248	0.0220	0.0214	0.0218	0.0227	0.0223	0.0227	0.0233
93-96 (4)	1999	0.0201	0.0181	0.0320	0.0197	0.0208	0.0298	0.0237	0.0162	0.0199	0.0202	0.0205	0.0215	0.0212	0.0217	0.0220
88-92 (5)	1995	-0.0244	-0.0309	-0.0309	-0.0309	-0.0309	-0.0309	-0.0251	-0.0161	-0.0120	-0.0132	-0.0204	-0.0173	-0.0170	-0.0173	-0.0179
89-93 (5)	1996	0.0157	0.0167	0.0167	0.0167	0.0167	0.0090	0.0155	0.0249	0.0209	0.0157	0.0137	0.0141	0.0140	0.0141	0.0145
90-94 (5)	1997	0.1132	0.1110	0.1110	0.1110	0.1104	0.1074	0.1151	0.1127	0.1083	0.1039	0.1077	0.1122	0.1106	0.1130	0.1155
91-95 (5)	1998	0.0783	0.0977	0.0977	0.0682	0.0693	0.0661	0.0670	0.0598	0.0559	0.0539	0.0549	0.0571	0.0563	0.0575	0.0588
92-96 (5)	1999	0.0332	0.0343	0.0482	0.0359	0.0370	0.0430	0.0394	0.0312	0.0297	0.0294	0.0300	0.0313	0.0309	0.0315	0.0322
88-93 (6)	1996	-0.0165	-0.0160	-0.0160	-0.0160	-0.0160	-0.0237	-0.0172	-0.0078	-0.0101	-0.0134	-0.0188	-0.0166	-0.0164	-0.0168	-0.0171
89-94 (6)	1997	0.1031	0.1007	0.1007	0.1007	0.1001	0.0971	0.1048	0.1051	0.1021	0.0982	0.0984	0.1025	0.1011	0.1032	0.1056
90-95 (6)	1998	0.0756	0.0931	0.0931	0.0636	0.0647	0.0615	0.0639	0.0595	0.0560	0.0518	0.0542	0.0564	0.0555	0.0567	0.0580
91-96 (6)	1999	0.0546	0.0552	0.0691	0.0568	0.0579	0.0619	0.0603	0.0537	0.0509	0.0494	0.0503	0.0525	0.0518	0.0528	0.0540
88-94 (7)	1997	0.0766	0.0733	0.0733	0.0733	0.0727	0.0697	0.0774	0.0796	0.0776	0.0750	0.0721	0.0777	0.0766	0.0783	0.0800
89-95 (7)	1998	0.0739	0.0907	0.0907	0.0612	0.0623	0.0591	0.0625	0.0604	0.0576	0.0535	0.0532	0.0553	0.0545	0.0556	0.0569
90-96 (7)	1999	0.0527	0.0529	0.0668	0.0545	0.0556	0.0583	0.0582	0.0533	0.0505	0.0469	0.0490	0.0510	0.0503	0.0513	0.0525
88-95 (8)	1998	0.0557	0.0715	0.0715	0.0420	0.0431	0.0399	0.0439	0.0436	0.0414	0.0381	0.0353	0.0388	0.0382	0.0391	0.0399
89-96 (8)	1999	0.0512	0.0516	0.0655	0.0532	0.0543	0.0561	0.0571	0.0539	0.0514	0.0476	0.0475	0.0494	0.0489	0.0498	0.0509
88-96 (9)	1999	0.0357	0.0355	0.0494	0.0371	0.0382	0.0394	0.0412	0.0394	0.0374	0.0340	0.0318	0.0348	0.0344	0.0351	0.0358

**Medical  
Exponential Fit  
Trended Loss Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	0.8749	0.8252	0.8252	0.8252	0.8252	0.8252	0.8252	0.8252	0.8252	0.8356	0.8737	0.8962	0.8844	0.9027	0.9244
89-92 (4)	1995	0.7846	0.7359	0.7359	0.7359	0.7359	0.7359	0.7359	0.7359	0.7359	0.7543	0.7756	0.8081	0.7973	0.8141	0.8335
90-93 (4)	1996	0.7751	0.7236	0.7236	0.7236	0.7236	0.7236	0.7236	0.7236	0.7371	0.7587	0.7692	0.8014	0.7909	0.8075	0.8267
91-94 (4)	1997	0.7886	0.7272	0.7272	0.7272	0.7272	0.7272	0.7272	0.7479	0.7608	0.7765	0.7910	0.8242	0.8135	0.8303	0.8502
92-95 (4)	1998	0.9364	0.8606	0.8606	0.8606	0.8606	0.8606	0.8721	0.9010	0.9108	0.9249	0.9424	0.9816	0.9688	0.9891	1.0125
93-96 (4)	1999	0.9879	0.9224	0.9224	0.9224	0.9224	0.9068	0.9253	0.9497	0.9488	0.9618	0.9805	1.0211	1.0077	1.0286	1.0532
88-92 (5)	1995	0.8737	0.8221	0.8221	0.8221	0.8221	0.8221	0.8221	0.8221	0.8221	0.8386	0.8708	0.8971	0.8853	0.9036	0.9253
89-93 (5)	1996	0.8067	0.7518	0.7518	0.7518	0.7518	0.7518	0.7518	0.7518	0.7623	0.7827	0.8021	0.8357	0.8246	0.8420	0.8621
90-94 (5)	1997	0.8250	0.7637	0.7637	0.7637	0.7637	0.7637	0.7637	0.7800	0.7916	0.8125	0.8247	0.8593	0.8481	0.8658	0.8865
91-95 (5)	1998	0.8973	0.8259	0.8259	0.8259	0.8259	0.8259	0.8342	0.8575	0.8688	0.8852	0.9020	0.9397	0.9274	0.9467	0.9692
92-96 (5)	1999	0.9774	0.9064	0.9064	0.9064	0.9064	0.8949	0.9098	0.9355	0.9434	0.9576	0.9760	1.0165	1.0031	1.0241	1.0485
88-93 (6)	1996	0.8881	0.8302	0.8302	0.8302	0.8302	0.8302	0.8302	0.8302	0.8394	0.8591	0.8882	0.9174	0.9053	0.9241	0.9463
89-94 (6)	1997	0.8523	0.7886	0.7886	0.7886	0.7886	0.7886	0.7886	0.8019	0.8122	0.8333	0.8525	0.8883	0.8766	0.8949	0.9163
90-95 (6)	1998	0.9156	0.8446	0.8446	0.8446	0.8446	0.8446	0.8446	0.8513	0.8714	0.8826	0.9039	0.9184	0.9568	0.9443	0.9869
91-96 (6)	1999	0.9530	0.8822	0.8822	0.8822	0.8822	0.8733	0.8854	0.9088	0.9188	0.9353	0.9532	0.9928	0.9798	1.0002	1.0241
88-94 (7)	1997	0.9251	0.8586	0.8586	0.8586	0.8586	0.8586	0.8586	0.8705	0.8802	0.9015	0.9293	0.9615	0.9489	0.9686	0.9919
89-95 (7)	1998	0.9341	0.8613	0.8613	0.8613	0.8613	0.8613	0.8669	0.8844	0.8950	0.9172	0.9375	0.9768	0.9639	0.9841	1.0075
90-96 (7)	1999	0.9702	0.8981	0.8981	0.8981	0.8981	0.8906	0.9012	0.9227	0.9332	0.9542	0.9703	1.0107	0.9974	1.0183	1.0426
88-95 (8)	1998	0.9978	0.9223	0.9223	0.9223	0.9223	0.9223	0.9274	0.9437	0.9540	0.9769	1.0051	1.0411	1.0274	1.0488	1.0739
89-96 (8)	1999	0.9889	0.9140	0.9140	0.9140	0.9140	0.9075	0.9169	0.9366	0.9470	0.9695	0.9905	1.0318	1.0182	1.0395	1.0643
88-96 (9)	1999	1.0492	0.9708	0.9708	0.9708	0.9708	0.9648	0.9736	0.9926	1.0030	1.0266	1.0549	1.0935	1.0791	1.1016	1.1280

**Medical**  
**Exponential Fit**  
**Differences: (Actual - Trended)**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-2)	Severity Ratio (Pd-3)	Severity Ratio (Pd-4)	Severity Ratio (Pd-5)	Severity Ratio (Pd-6)	Severity Ratio (Pd-7)	Severity Ratio (Pd-8)	Severity Ratio (Pd-10)	Severity Ratio (Pd-12)	Severity Ratio (Pd-14)	Severity Ratio (Pd-16)	Severity Ratio (Pd-18)	Severity Ratio (Pd-20)
88-91 (4)	1994	-0.2051	-0.1981	-0.1981	-0.1981	-0.1981	-0.1981	-0.1981	-0.1870	-0.1834	-0.1850	-0.2108	-0.2056	-0.2028	-0.2070	-0.2120
89-92 (4)	1995	-0.0381	-0.0382	-0.0382	-0.0382	-0.0382	-0.0382	-0.0324	-0.0234	-0.0193	-0.0279	-0.0353	-0.0370	-0.0363	-0.0372	-0.0382
90-93 (4)	1996	-0.0014	0.0032	0.0032	0.0032	0.0032	-0.0045	0.0020	0.0114	0.0020	-0.0094	-0.0055	-0.0060	-0.0059	-0.0062	-0.0062
91-94 (4)	1997	0.1125	0.1165	0.1165	0.1165	0.1159	0.1129	0.1206	0.1108	0.1026	0.0989	0.1010	0.1051	0.1036	0.1059	0.1083
92-95 (4)	1998	0.0037	0.0345	0.0345	0.0050	0.0061	0.0029	-0.0007	-0.0183	-0.0232	-0.0251	-0.0255	-0.0265	-0.0263	-0.0269	-0.0275
93-96 (4)	1999	-0.0252	-0.0227	-0.0088	-0.0211	-0.0200	-0.0077	-0.0179	-0.0307	-0.0248	-0.0251	-0.0258	-0.0267	-0.0263	-0.0268	-0.0276
88-92 (5)	1995	-0.1272	-0.1244	-0.1244	-0.1244	-0.1244	-0.1244	-0.1186	-0.1096	-0.1055	-0.1122	-0.1305	-0.1260	-0.1243	-0.1267	-0.1300
89-93 (5)	1996	-0.0330	-0.0250	-0.0250	-0.0250	-0.0250	-0.0327	-0.0262	-0.0168	-0.0232	-0.0334	-0.0384	-0.0403	-0.0396	-0.0407	-0.0416
90-94 (5)	1997	0.0761	0.0800	0.0800	0.0800	0.0794	0.0764	0.0841	0.0787	0.0718	0.0629	0.0673	0.0700	0.0690	0.0704	0.0720
91-95 (5)	1998	0.0428	0.0692	0.0692	0.0397	0.0408	0.0376	0.0372	0.0252	0.0188	0.0146	0.0149	0.0154	0.0151	0.0155	0.0158
92-96 (5)	1999	-0.0147	-0.0067	0.0072	-0.0051	-0.0040	0.0042	-0.0024	-0.0165	-0.0194	-0.0209	-0.0213	-0.0221	-0.0217	-0.0223	-0.0229
88-93 (6)	1996	-0.1144	-0.1034	-0.1034	-0.1034	-0.1034	-0.1111	-0.1046	-0.0952	-0.1003	-0.1098	-0.1245	-0.1220	-0.1203	-0.1228	-0.1258
89-94 (6)	1997	0.0488	0.0551	0.0551	0.0551	0.0545	0.0515	0.0592	0.0568	0.0512	0.0421	0.0395	0.0410	0.0405	0.0413	0.0422
90-95 (6)	1998	0.0245	0.0505	0.0505	0.0210	0.0221	0.0189	0.0201	0.0113	0.0050	-0.0041	-0.0015	-0.0017	-0.0018	-0.0019	-0.0019
91-96 (6)	1999	0.0097	0.0175	0.0314	0.0191	0.0202	0.0258	0.0220	0.0102	0.0052	0.0014	0.0015	0.0016	0.0016	0.0016	0.0015
88-94 (7)	1997	-0.0240	-0.0149	-0.0149	-0.0149	-0.0155	-0.0185	-0.0108	-0.0118	-0.0168	-0.0261	-0.0373	-0.0322	-0.0318	-0.0324	-0.0334
89-95 (7)	1998	0.0060	0.0338	0.0338	0.0043	0.0054	0.0022	0.0045	-0.0017	-0.0074	-0.0174	-0.0206	-0.0217	-0.0214	-0.0219	-0.0225
90-96 (7)	1999	-0.0075	0.0016	0.0155	0.0032	0.0043	0.0085	0.0062	-0.0037	-0.0092	-0.0175	-0.0156	-0.0163	-0.0160	-0.0165	-0.0170
88-95 (8)	1998	-0.0577	-0.0272	-0.0272	-0.0567	-0.0556	-0.0588	-0.0560	-0.0610	-0.0664	-0.0771	-0.0882	-0.0860	-0.0849	-0.0866	-0.0889
89-96 (8)	1999	-0.0262	-0.0143	-0.0004	-0.0127	-0.0116	-0.0084	-0.0095	-0.0176	-0.0230	-0.0328	-0.0358	-0.0374	-0.0368	-0.0377	-0.0387
88-96 (9)	1999	-0.0865	-0.0711	-0.0572	-0.0695	-0.0684	-0.0657	-0.0662	-0.0736	-0.0790	-0.0899	-0.1002	-0.0991	-0.0977	-0.0998	-0.1024