

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 1989 through 2000, 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 2000 3.25 years, policy year 1999 4.25 years, and policy year 1998 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 0.8359 for policy year 1997. Fitting the loss ratios for policy years 1991 to 1994 using a straight line and projecting that to 1997 yielded a loss ratio of 0.9549 which overstates our current estimate for 1997 by 0.1190 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)
	1989	0.7349	0.7048	0.7048	0.7048	0.7048	0.7048	0.7048	0.7048	0.7048	0.7048	0.7048	0.7279	0.7394	0.7497	0.7651
	1990	0.7701	0.7385	0.7385	0.7385	0.7385	0.7385	0.7385	0.7385	0.7385	0.7385	0.7446	0.7628	0.7748	0.7856	0.8017
	1991	0.8152	0.7811	0.7811	0.7811	0.7811	0.7811	0.7811	0.7811	0.7811	0.7811	0.7886	0.8079	0.8206	0.8320	0.8492
	1992	0.8035	0.7753	0.7753	0.7753	0.7753	0.7753	0.7753	0.7753	0.7753	0.7661	0.7724	0.7913	0.8038	0.8149	0.8317
	1993	0.8503	0.8165	0.8165	0.8165	0.8165	0.8165	0.8165	0.8165	0.8165	0.8141	0.8209	0.8410	0.8542	0.8661	0.8839
	1994	0.9175	0.8735	0.8735	0.8735	0.8735	0.8735	0.8735	0.8735	0.8929	0.8858	0.8932	0.9150	0.9294	0.9423	0.9617
	1995	0.9470	0.8864	0.8864	0.8864	0.8864	0.8864	0.8864	0.9197	0.9357	0.9282	0.9359	0.9589	0.9738	0.9873	1.0077
	1996	0.8373	0.7652	0.7652	0.7652	0.7652	0.7652	0.8119	0.8299	0.8444	0.8376	0.8446	0.8652	0.8788	0.8911	0.9094
	1997	0.9317	0.8359	0.8359	0.8359	0.8359	0.8818	0.9170	0.9375	0.9538	0.9462	0.9539	0.9774	0.9926	1.0066	1.0273
	1998	0.9490	0.8604	0.8604	0.8604	0.8576	0.8907	0.9263	0.9469	0.9634	0.9557	0.9638	0.9873	1.0027	1.0169	1.0377
	1999	1.0513	0.9494	0.9494	0.9518	0.9533	0.9899	1.0295	1.0526	1.0709	1.0623	1.0711	1.0973	1.1145	1.1301	1.1535
	2000	1.1609	1.0357	1.0593	1.0612	1.0631	1.1040	1.1481	1.1738	1.1942	1.1847	1.1945	1.2238	1.2430	1.2602	1.2861

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)
89-92 (4)	1995	0.8938	0.8643	0.8643	0.8643	0.8643	0.8643	0.8643	0.8643	0.8643	0.8496	0.8637	0.8784	0.8922	0.9045	0.9232
90-93 (4)	1996	0.9128	0.8805	0.8805	0.8805	0.8805	0.8805	0.8805	0.8805	0.8805	0.8703	0.8773	0.8988	0.9130	0.9256	0.9447
91-94 (4)	1997	1.0058	0.9549	0.9549	0.9549	0.9549	0.9549	0.9549	0.9549	0.9549	0.9859	0.9747	0.9818	1.0058	1.0216	1.0358
92-95 (4)	1998	1.1035	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0668	1.1060	1.0997	1.1089	1.1361	1.1536	1.1697
93-96 (4)	1999	0.8838	0.7720	0.7720	0.7720	0.7720	0.7720	0.7720	0.8467	0.8988	0.9293	0.9172	0.9249	0.9475	0.9622	0.9757
94-97 (4)	2000	0.8782	0.7350	0.7350	0.7350	0.7350	0.7350	0.8084	0.8974	0.9361	0.9478	0.9402	0.9478	0.9712	0.9862	1.0003
89-93 (5)	1996	0.9269	0.8933	0.8933	0.8933	0.8933	0.8933	0.8933	0.8933	0.8933	0.8840	0.8963	0.9135	0.9279	0.9407	0.9601
90-94 (5)	1997	0.9963	0.9497	0.9497	0.9497	0.9497	0.9497	0.9497	0.9497	0.9730	0.9609	0.9687	0.9923	1.0080	1.0219	1.0430
91-95 (5)	1998	1.0555	0.9810	0.9810	0.9810	0.9810	0.9810	0.9810	1.0209	1.0537	1.0420	1.0499	1.0757	1.0924	1.1075	1.1303
92-96 (5)	1999	0.9533	0.8482	0.8482	0.8482	0.8482	0.8482	0.8482	0.9043	0.9492	0.9817	0.9749	0.9831	1.0071	1.0228	1.0371
93-97 (5)	2000	0.9381	0.8008	0.8008	0.8008	0.8008	0.8558	0.9308	0.9746	1.0017	0.9904	0.9984	1.0230	1.0389	1.0536	1.0753
89-94 (6)	1997	0.9947	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9685	0.9572	0.9689	0.9889	1.0044	1.0184	1.0394
90-95 (6)	1998	1.0452	0.9781	0.9781	0.9781	0.9781	0.9781	0.9781	1.0098	1.0375	1.0249	1.0332	1.0585	1.0750	1.0899	1.1124
91-96 (6)	1999	0.9574	0.8652	0.8652	0.8652	0.8652	0.8652	0.8652	0.9096	0.9480	0.9783	0.9676	0.9750	0.9989	1.0145	1.0286
92-97 (6)	2000	0.9805	0.8509	0.8509	0.8509	0.8509	0.8946	0.9580	0.9998	1.0299	1.0222	1.0306	1.0560	1.0724	1.0875	1.1099
89-95 (7)	1998	1.0411	0.9788	0.9788	0.9788	0.9788	0.9788	0.9788	1.0049	1.0286	1.0165	1.0278	1.0501	1.0664	1.0812	1.1035
90-96 (7)	1999	0.9728	0.8886	0.8886	0.8886	0.8886	0.8886	0.8886	0.9252	0.9584	0.9859	0.9740	0.9819	1.0059	1.0216	1.0359
91-97 (7)	2000	0.9819	0.8650	0.8650	0.8650	0.8650	0.9011	0.9554	0.9937	1.0233	1.0125	1.0204	1.0454	1.0617	1.0766	1.0987
89-96 (8)	1999	0.9858	0.9072	0.9072	0.9072	0.9072	0.9072	0.9384	0.9674	0.9922	0.9804	0.9909	1.0127	1.0285	1.0428	1.0643
90-97 (8)	2000	0.9937	0.8859	0.8859	0.8859	0.8859	0.9165	0.9638	0.9986	1.0265	1.0147	1.0229	1.0480	1.0643	1.0792	1.1014
89-97 (9)	2000	1.0047	0.9040	0.9040	0.9040	0.9040	0.9305	0.9724	1.0040	1.0301	1.0181	1.0285	1.0516	1.0680	1.0830	1.1053

**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)
89-92 (4)	1995	0.0532	0.0221	0.0221	0.0221	0.0221	0.0221	0.0221	0.0554	0.0714	0.0786	0.0722	0.0805	0.0816	0.0829	0.0845
90-93 (4)	1996	-0.0755	-0.1153	-0.1153	-0.1153	-0.1153	-0.1153	-0.0686	-0.0506	-0.0361	-0.0327	-0.0327	-0.0336	-0.0342	-0.0345	-0.0353
91-94 (4)	1997	-0.0741	-0.1190	-0.1190	-0.1190	-0.1190	-0.0731	-0.0379	-0.0174	-0.0321	-0.0285	-0.0279	-0.0283	-0.0290	-0.0292	-0.0297
92-95 (4)	1998	-0.1545	-0.1532	-0.1532	-0.1532	-0.1560	-0.1229	-0.0873	-0.1199	-0.1426	-0.1440	-0.1451	-0.1488	-0.1509	-0.1528	-0.1562
93-96 (4)	1999	0.1676	0.1775	0.1775	0.1799	0.1814	0.2180	0.1828	0.1538	0.1416	0.1451	0.1462	0.1498	0.1523	0.1544	0.1577
94-97 (4)	2000	0.2827	0.3007	0.3243	0.3262	0.3281	0.2956	0.2507	0.2377	0.2464	0.2445	0.2467	0.2526	0.2568	0.2599	0.2652
89-93 (5)	1996	-0.0896	-0.1281	-0.1281	-0.1281	-0.1281	-0.1281	-0.0814	-0.0634	-0.0489	-0.0464	-0.0517	-0.0483	-0.0491	-0.0496	-0.0507
90-94 (5)	1997	-0.0646	-0.1138	-0.1138	-0.1138	-0.1138	-0.0679	-0.0327	-0.0122	-0.0192	-0.0147	-0.0148	-0.0149	-0.0154	-0.0153	-0.0157
91-95 (5)	1998	-0.1065	-0.1206	-0.1206	-0.1206	-0.1234	-0.0903	-0.0547	-0.0740	-0.0903	-0.0863	-0.0861	-0.0884	-0.0897	-0.0906	-0.0926
92-96 (5)	1999	0.0980	0.1012	0.1012	0.1036	0.1051	0.1417	0.1252	0.1034	0.0892	0.0874	0.0880	0.0902	0.0917	0.0930	0.0950
93-97 (5)	2000	0.2228	0.2350	0.2586	0.2605	0.2624	0.2482	0.2173	0.1992	0.1925	0.1943	0.1961	0.2008	0.2041	0.2066	0.2108
89-94 (6)	1997	-0.0630	-0.1141	-0.1141	-0.1141	-0.1141	-0.0682	-0.0330	-0.0125	-0.0147	-0.0110	-0.0150	-0.0115	-0.0118	-0.0118	-0.0121
90-95 (6)	1998	-0.0962	-0.1177	-0.1177	-0.1177	-0.1205	-0.0874	-0.0518	-0.0629	-0.0741	-0.0692	-0.0694	-0.0712	-0.0723	-0.0730	-0.0747
91-96 (6)	1999	0.0939	0.0842	0.0842	0.0866	0.0881	0.1247	0.1199	0.1046	0.0926	0.0947	0.0961	0.0984	0.1000	0.1015	0.1037
92-97 (6)	2000	0.1804	0.1848	0.2084	0.2103	0.2122	0.2094	0.1901	0.1740	0.1643	0.1625	0.1639	0.1678	0.1706	0.1727	0.1762
89-95 (7)	1998	-0.0921	-0.1184	-0.1184	-0.1184	-0.1212	-0.0881	-0.0525	-0.0580	-0.0652	-0.0608	-0.0640	-0.0628	-0.0637	-0.0643	-0.0658
90-96 (7)	1999	0.0785	0.0608	0.0608	0.0632	0.0647	0.1013	0.1043	0.0942	0.0850	0.0883	0.0892	0.0914	0.0929	0.0942	0.0963
91-97 (7)	2000	0.1790	0.1707	0.1943	0.1962	0.1981	0.2029	0.1927	0.1801	0.1709	0.1722	0.1742	0.1784	0.1813	0.1836	0.1874
89-96 (8)	1999	0.0655	0.0422	0.0422	0.0446	0.0461	0.0827	0.0911	0.0852	0.0787	0.0819	0.0802	0.0846	0.0860	0.0873	0.0892
90-97 (8)	2000	0.1672	0.1498	0.1734	0.1753	0.1772	0.1875	0.1843	0.1752	0.1677	0.1700	0.1717	0.1758	0.1787	0.1810	0.1847
89-97 (9)	2000	0.1562	0.1317	0.1553	0.1572	0.1591	0.1735	0.1757	0.1698	0.1641	0.1666	0.1660	0.1722	0.1750	0.1772	0.1808

**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)
89-92 (4)	1995	0.9030	0.8740	0.8740	0.8740	0.8740	0.8740	0.8740	0.8740	0.8740	0.8574	0.8732	0.8866	0.9006	0.9129	0.9319
90-93 (4)	1996	0.9191	0.8872	0.8872	0.8872	0.8872	0.8872	0.8872	0.8872	0.8872	0.8757	0.8828	0.9045	0.9187	0.9314	0.9506
91-94 (4)	1997	1.0174	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9995	0.9871	0.9941	1.0183	1.0343	1.0487	1.0701
92-95 (4)	1998	1.1339	1.0334	1.0334	1.0334	1.0334	1.0334	1.0334	1.0963	1.1444	1.1390	1.1485	1.1768	1.1949	1.2115	1.2366
93-96 (4)	1999	0.8811	0.7691	0.7691	0.7691	0.7691	0.7691	0.8456	0.8986	0.9310	0.9183	0.9260	0.9486	0.9634	0.9769	0.9970
94-97 (4)	2000	0.8764	0.7399	0.7399	0.7399	0.7399	0.8060	0.8944	0.9340	0.9454	0.9378	0.9453	0.9687	0.9837	0.9977	1.0182
89-93 (5)	1996	0.9382	0.9048	0.9048	0.9048	0.9048	0.9048	0.9048	0.9048	0.9048	0.8941	0.9078	0.9240	0.9385	0.9515	0.9711
90-94 (5)	1997	1.0097	0.9622	0.9622	0.9622	0.9622	0.9622	0.9622	0.9622	0.9879	0.9742	0.9820	1.0060	1.0218	1.0360	1.0573
91-95 (5)	1998	1.0736	0.9941	0.9941	0.9941	0.9941	0.9941	0.9941	1.0391	1.0772	1.0641	1.0719	1.0982	1.1152	1.1307	1.1540
92-96 (5)	1999	0.9562	0.8452	0.8452	0.8452	0.8452	0.8452	0.9075	0.9560	0.9923	0.9859	0.9942	1.0185	1.0343	1.0488	1.0704
93-97 (5)	2000	0.9375	0.7995	0.7995	0.7995	0.7995	0.8524	0.9313	0.9783	1.0078	0.9956	1.0037	1.0284	1.0443	1.0591	1.0809
89-94 (6)	1997	1.0121	0.9666	0.9666	0.9666	0.9666	0.9666	0.9666	0.9666	0.9870	0.9739	0.9871	1.0062	1.0220	1.0362	1.0575
90-95 (6)	1998	1.0646	0.9938	0.9938	0.9938	0.9938	0.9938	0.9938	1.0293	1.0611	1.0465	1.0549	1.0808	1.0976	1.1128	1.1358
91-96 (6)	1999	0.9607	0.8633	0.8633	0.8633	0.8633	0.8633	0.9134	0.9548	0.9885	0.9769	0.9843	1.0083	1.0240	1.0384	1.0597
92-97 (6)	2000	0.9858	0.8500	0.8500	0.8500	0.8500	0.8944	0.9642	1.0106	1.0447	1.0373	1.0458	1.0715	1.0881	1.1035	1.1262
89-95 (7)	1998	1.0641	0.9984	0.9984	0.9984	0.9984	0.9984	0.9984	1.0277	1.0549	1.0406	1.0536	1.0751	1.0918	1.1069	1.1298
90-96 (7)	1999	0.9803	0.8904	0.8904	0.8904	0.8904	0.8904	0.9328	0.9692	1.0000	0.9868	0.9947	1.0190	1.0349	1.0493	1.0710
91-97 (7)	2000	0.9875	0.8647	0.8647	0.8647	0.8647	0.9017	0.9619	1.0043	1.0377	1.0260	1.0338	1.0592	1.0756	1.0908	1.1132
89-96 (8)	1999	0.9984	0.9140	0.9140	0.9140	0.9140	0.9140	0.9508	0.9832	1.0113	0.9977	1.0094	1.0306	1.0467	1.0613	1.0832
90-97 (8)	2000	1.0031	0.8884	0.8884	0.8884	0.8884	0.9207	0.9741	1.0130	1.0448	1.0315	1.0397	1.0652	1.0818	1.0970	1.1196
89-97 (9)	2000	1.0192	0.9108	0.9108	0.9108	0.9108	0.9394	0.9875	1.0233	1.0532	1.0394	1.0509	1.0737	1.0903	1.1056	1.1284

**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)
89-92 (4)	1995	0.0440	0.0124	0.0124	0.0124	0.0124	0.0124	0.0124	0.0457	0.0617	0.0708	0.0627	0.0723	0.0732	0.0744	0.0758
90-93 (4)	1996	-0.0818	-0.1220	-0.1220	-0.1220	-0.1220	-0.1220	-0.0753	-0.0573	-0.0428	-0.0381	-0.0382	-0.0393	-0.0399	-0.0403	-0.0412
91-94 (4)	1997	-0.0857	-0.1291	-0.1291	-0.1291	-0.1291	-0.0832	-0.0480	-0.0275	-0.0457	-0.0409	-0.0402	-0.0409	-0.0417	-0.0421	-0.0428
92-95 (4)	1998	-0.1849	-0.1730	-0.1730	-0.1730	-0.1758	-0.1427	-0.1071	-0.1494	-0.1810	-0.1833	-0.1847	-0.1895	-0.1922	-0.1946	-0.1989
93-96 (4)	1999	0.1702	0.1803	0.1803	0.1827	0.1842	0.2208	0.1839	0.1540	0.1399	0.1440	0.1451	0.1487	0.1511	0.1532	0.1565
94-97 (4)	2000	0.2845	0.2958	0.3194	0.3213	0.3232	0.2980	0.2537	0.2398	0.2488	0.2469	0.2492	0.2551	0.2593	0.2625	0.2679
89-93 (5)	1996	-0.1009	-0.1396	-0.1396	-0.1396	-0.1396	-0.1396	-0.0929	-0.0749	-0.0604	-0.0565	-0.0632	-0.0588	-0.0597	-0.0604	-0.0617
90-94 (5)	1997	-0.0780	-0.1263	-0.1263	-0.1263	-0.1263	-0.0804	-0.0452	-0.0247	-0.0341	-0.0280	-0.0281	-0.0286	-0.0292	-0.0294	-0.0300
91-95 (5)	1998	-0.1246	-0.1337	-0.1337	-0.1337	-0.1365	-0.1034	-0.0678	-0.0922	-0.1138	-0.1084	-0.1081	-0.1109	-0.1125	-0.1138	-0.1163
92-96 (5)	1999	0.0951	0.1042	0.1042	0.1066	0.1081	0.1447	0.1220	0.0966	0.0786	0.0764	0.0769	0.0788	0.0802	0.0813	0.0831
93-97 (5)	2000	0.2234	0.2362	0.2598	0.2617	0.2636	0.2516	0.2168	0.1955	0.1864	0.1891	0.1908	0.1954	0.1987	0.2011	0.2052
89-94 (6)	1997	-0.0804	-0.1307	-0.1307	-0.1307	-0.1307	-0.0848	-0.0496	-0.0291	-0.0332	-0.0277	-0.0332	-0.0288	-0.0294	-0.0296	-0.0302
90-95 (6)	1998	-0.1156	-0.1334	-0.1334	-0.1334	-0.1362	-0.1031	-0.0675	-0.0824	-0.0977	-0.0908	-0.0911	-0.0935	-0.0949	-0.0959	-0.0981
91-96 (6)	1999	0.0906	0.0861	0.0861	0.0885	0.0900	0.1266	0.1161	0.0978	0.0824	0.0854	0.0868	0.0890	0.0905	0.0917	0.0938
92-97 (6)	2000	0.1751	0.1857	0.2093	0.2112	0.2131	0.2096	0.1839	0.1632	0.1495	0.1474	0.1487	0.1523	0.1549	0.1567	0.1599
89-95 (7)	1998	-0.1151	-0.1380	-0.1380	-0.1380	-0.1408	-0.1077	-0.0721	-0.0808	-0.0915	-0.0849	-0.0898	-0.0878	-0.0891	-0.0900	-0.0921
90-96 (7)	1999	0.0710	0.0590	0.0590	0.0614	0.0629	0.0995	0.0967	0.0834	0.0709	0.0755	0.0764	0.0783	0.0796	0.0808	0.0825
91-97 (7)	2000	0.1734	0.1710	0.1946	0.1965	0.1984	0.2023	0.1862	0.1695	0.1565	0.1587	0.1607	0.1646	0.1674	0.1694	0.1729
89-96 (8)	1999	0.0529	0.0354	0.0354	0.0378	0.0393	0.0759	0.0787	0.0694	0.0596	0.0646	0.0617	0.0667	0.0678	0.0688	0.0703
90-97 (8)	2000	0.1578	0.1473	0.1709	0.1728	0.1747	0.1833	0.1740	0.1608	0.1494	0.1532	0.1548	0.1586	0.1612	0.1632	0.1665
89-97 (9)	2000	0.1417	0.1249	0.1485	0.1504	0.1523	0.1646	0.1606	0.1505	0.1410	0.1453	0.1436	0.1501	0.1527	0.1546	0.1577

**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)
	1989	0.4399	0.4318	0.4318	0.4318	0.4318	0.4318	0.4318	0.4318	0.4318	0.4318	0.4318	0.4340	0.4508	0.4423	0.4480
	1990	0.4854	0.4731	0.4731	0.4731	0.4731	0.4731	0.4731	0.4731	0.4731	0.4731	0.4762	0.4821	0.5007	0.4912	0.4977
	1991	0.5503	0.5390	0.5390	0.5390	0.5390	0.5390	0.5390	0.5390	0.5390	0.5390	0.5375	0.5441	0.5652	0.5544	0.5617
	1992	0.5800	0.5713	0.5713	0.5713	0.5713	0.5713	0.5713	0.5713	0.5713	0.5623	0.5633	0.5702	0.5924	0.5811	0.5886
	1993	0.6101	0.5982	0.5982	0.5982	0.5982	0.5982	0.5982	0.5982	0.5982	0.5940	0.5951	0.6025	0.6258	0.6139	0.6219
	1994	0.6605	0.6491	0.6491	0.6491	0.6491	0.6491	0.6491	0.6491	0.6464	0.6416	0.6428	0.6508	0.6759	0.6632	0.6719
	1995	0.7390	0.7278	0.7278	0.7278	0.7278	0.7278	0.7278	0.7210	0.7215	0.7163	0.7175	0.7265	0.7546	0.7403	0.7500
	1996	0.7577	0.7559	0.7559	0.7559	0.7559	0.7559	0.7320	0.7303	0.7309	0.7256	0.7269	0.7359	0.7643	0.7498	0.7596
	1997	0.8647	0.8624	0.8624	0.8624	0.8624	0.8495	0.8357	0.8336	0.8344	0.8284	0.8297	0.8400	0.8725	0.8560	0.8673
	1998	0.9290	0.9473	0.9473	0.9473	0.9016	0.8920	0.8774	0.8755	0.8762	0.8699	0.8714	0.8822	0.9163	0.8989	0.9107
	1999	0.9817	0.9936	0.9936	0.9857	0.9604	0.9502	0.9348	0.9326	0.9333	0.9265	0.9280	0.9397	0.9760	0.9575	0.9701
	2000	1.0971	1.1095	1.1176	1.1026	1.0743	1.0628	1.0455	1.0431	1.0438	1.0364	1.0381	1.0509	1.0916	1.0709	1.0850

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)
89-92 (4)	1995	0.7322	0.7218	0.7218	0.7218	0.7218	0.7218	0.7218	0.7218	0.7218	0.7074	0.7073	0.7194	0.7475	0.7331	0.7426
90-93 (4)	1996	0.7382	0.7288	0.7288	0.7288	0.7288	0.7288	0.7288	0.7288	0.7288	0.7158	0.7152	0.7240	0.7522	0.7378	0.7473
91-94 (4)	1997	0.7625	0.7501	0.7501	0.7501	0.7501	0.7501	0.7501	0.7501	0.7501	0.7458	0.7370	0.7411	0.7505	0.7793	0.7648
92-95 (4)	1998	0.8847	0.8708	0.8708	0.8708	0.8708	0.8708	0.8708	0.8708	0.8599	0.8588	0.8579	0.8593	0.8702	0.9037	0.8867
93-96 (4)	1999	0.9264	0.9311	0.9311	0.9311	0.9311	0.9311	0.9311	0.8928	0.8853	0.8872	0.8807	0.8821	0.8931	0.9275	0.9100
94-97 (4)	2000	1.0396	1.0494	1.0494	1.0494	1.0494	1.0288	0.9899	0.9868	0.9913	0.9843	0.9858	0.9980	1.0366	1.0169	1.0303
89-93 (5)	1996	0.7506	0.7382	0.7382	0.7382	0.7382	0.7382	0.7382	0.7382	0.7382	0.7268	0.7276	0.7391	0.7678	0.7531	0.7629
90-94 (5)	1997	0.7823	0.7717	0.7717	0.7717	0.7717	0.7717	0.7717	0.7717	0.7717	0.7685	0.7580	0.7584	0.7678	0.7975	0.7927
91-95 (5)	1998	0.8569	0.8448	0.8448	0.8448	0.8448	0.8448	0.8448	0.8448	0.8366	0.8353	0.8276	0.8310	0.8415	0.8739	0.8688
92-96 (5)	1999	0.9116	0.9099	0.9099	0.9099	0.9099	0.9099	0.9099	0.8812	0.8744	0.8749	0.8724	0.8739	0.8849	0.9189	0.9016
93-97 (5)	2000	1.0296	1.0363	1.0363	1.0363	1.0363	1.0208	0.9875	0.9824	0.9847	0.9776	0.9791	0.9912	1.0295	1.0100	1.0234
89-94 (6)	1997	0.7911	0.7785	0.7785	0.7785	0.7785	0.7785	0.7785	0.7785	0.7785	0.7760	0.7658	0.7670	0.7785	0.8086	0.7933
90-95 (6)	1998	0.8602	0.8493	0.8493	0.8493	0.8493	0.8493	0.8493	0.8493	0.8429	0.8416	0.8322	0.8330	0.8434	0.8760	0.8595
91-96 (6)	1999	0.8954	0.8924	0.8924	0.8924	0.8924	0.8924	0.8924	0.8697	0.8637	0.8637	0.8565	0.8595	0.8703	0.9038	0.8868
92-97 (6)	2000	1.0076	1.0095	1.0095	1.0095	1.0095	1.0095	0.9973	0.9689	0.9636	0.9649	0.9609	0.9624	0.9744	1.0120	0.9929
89-95 (7)	1998	0.8609	0.8484	0.8484	0.8484	0.8484	0.8484	0.8484	0.8484	0.8431	0.8420	0.8323	0.8337	0.8457	0.8784	0.8618
90-96 (7)	1999	0.8993	0.8957	0.8957	0.8957	0.8957	0.8957	0.8957	0.8769	0.8717	0.8715	0.8627	0.8638	0.8746	0.9084	0.8912
91-97 (7)	2000	0.9862	0.9867	0.9867	0.9867	0.9867	0.9867	0.9766	0.9521	0.9471	0.9478	0.9404	0.9432	0.9549	0.9918	0.9731
89-96 (8)	1999	0.9010	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8791	0.8745	0.8742	0.8650	0.8665	0.8786	0.9125	0.8953
90-97 (8)	2000	0.9825	0.9822	0.9822	0.9822	0.9822	0.9822	0.9736	0.9521	0.9474	0.9479	0.9391	0.9404	0.9521	0.9889	0.9702
89-97 (9)	2000	0.9789	0.9762	0.9762	0.9762	0.9762	0.9688	0.9498	0.9454	0.9457	0.9365	0.9381	0.9509	0.9877	0.9690	0.9817



**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)
89-92 (4)	1995	0.0068	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	-0.0008	-0.0003	0.0089	0.0102	0.0071	0.0071	0.0072	0.0074
90-93 (4)	1996	0.0195	0.0271	0.0271	0.0271	0.0271	0.0271	0.0032	0.0015	0.0021	0.0098	0.0117	0.0119	0.0121	0.0120	0.0124
91-94 (4)	1997	0.1022	0.1123	0.1123	0.1123	0.1123	0.0994	0.0856	0.0835	0.0886	0.0914	0.0886	0.0895	0.0932	0.0912	0.0925
92-95 (4)	1998	0.0443	0.0765	0.0765	0.0765	0.0308	0.0212	0.0066	0.0156	0.0174	0.0120	0.0121	0.0120	0.0126	0.0122	0.0122
93-96 (4)	1999	0.0553	0.0625	0.0625	0.0546	0.0293	0.0191	0.0420	0.0473	0.0461	0.0458	0.0459	0.0466	0.0485	0.0475	0.0482
94-97 (4)	2000	0.0575	0.0601	0.0682	0.0532	0.0249	0.0340	0.0556	0.0563	0.0525	0.0521	0.0523	0.0529	0.0550	0.0540	0.0547
89-93 (5)	1996	0.0071	0.0177	0.0177	0.0177	0.0177	0.0177	-0.0062	-0.0079	-0.0073	-0.0012	-0.0007	-0.0032	-0.0035	-0.0033	-0.0033
90-94 (5)	1997	0.0824	0.0907	0.0907	0.0907	0.0907	0.0778	0.0640	0.0619	0.0659	0.0704	0.0713	0.0722	0.0750	0.0735	0.0746
91-95 (5)	1998	0.0721	0.1025	0.1025	0.1025	0.0568	0.0472	0.0326	0.0389	0.0409	0.0423	0.0404	0.0407	0.0424	0.0414	0.0419
92-96 (5)	1999	0.0701	0.0837	0.0837	0.0758	0.0505	0.0403	0.0536	0.0582	0.0584	0.0541	0.0541	0.0548	0.0571	0.0559	0.0567
93-97 (5)	2000	0.0675	0.0732	0.0813	0.0663	0.0380	0.0420	0.0580	0.0607	0.0591	0.0588	0.0591	0.0597	0.0621	0.0609	0.0616
89-94 (6)	1997	0.0736	0.0839	0.0839	0.0839	0.0839	0.0710	0.0572	0.0551	0.0584	0.0626	0.0627	0.0615	0.0639	0.0627	0.0636
90-95 (6)	1998	0.0688	0.0980	0.0980	0.0980	0.0523	0.0427	0.0281	0.0326	0.0346	0.0377	0.0384	0.0388	0.0403	0.0394	0.0400
91-96 (6)	1999	0.0863	0.1012	0.1012	0.0933	0.0680	0.0578	0.0651	0.0689	0.0696	0.0700	0.0685	0.0694	0.0722	0.0707	0.0717
92-97 (6)	2000	0.0895	0.1000	0.1081	0.0931	0.0648	0.0655	0.0766	0.0795	0.0789	0.0755	0.0757	0.0765	0.0796	0.0780	0.0789
89-95 (7)	1998	0.0681	0.0989	0.0989	0.0989	0.0532	0.0436	0.0290	0.0324	0.0343	0.0376	0.0377	0.0365	0.0379	0.0371	0.0376
90-96 (7)	1999	0.0824	0.0979	0.0979	0.0900	0.0647	0.0545	0.0579	0.0609	0.0618	0.0638	0.0642	0.0651	0.0676	0.0663	0.0673
91-97 (7)	2000	0.1109	0.1228	0.1309	0.1159	0.0876	0.0862	0.0934	0.0960	0.0960	0.0960	0.0949	0.0960	0.0998	0.0978	0.0991
89-96 (8)	1999	0.0807	0.0986	0.0986	0.0907	0.0654	0.0552	0.0557	0.0581	0.0591	0.0615	0.0615	0.0611	0.0635	0.0622	0.0631
90-97 (8)	2000	0.1146	0.1273	0.1354	0.1204	0.0921	0.0892	0.0934	0.0957	0.0959	0.0973	0.0977	0.0988	0.1027	0.1007	0.1021
89-97 (9)	2000	0.1182	0.1333	0.1414	0.1264	0.0981	0.0940	0.0957	0.0977	0.0981	0.0999	0.1000	0.1000	0.1039	0.1019	0.1033

**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)
89-92 (4)	1995	0.7852	0.7750	0.7750	0.7750	0.7750	0.7750	0.7750	0.7750	0.7750	0.7555	0.7552	0.7705	0.8006	0.7851	0.7954
90-93 (4)	1996	0.7731	0.7656	0.7656	0.7656	0.7656	0.7656	0.7656	0.7656	0.7656	0.7486	0.7468	0.7561	0.7855	0.7705	0.7803
91-94 (4)	1997	0.7838	0.7716	0.7716	0.7716	0.7716	0.7716	0.7716	0.7716	0.7664	0.7560	0.7613	0.7710	0.8005	0.7857	0.7959
92-95 (4)	1998	0.9266	0.9118	0.9118	0.9118	0.9118	0.9118	0.9118	0.8982	0.8966	0.8985	0.9000	0.9115	0.9465	0.9288	0.9412
93-96 (4)	1999	0.9713	0.9817	0.9817	0.9817	0.9817	0.9817	0.9325	0.9229	0.9254	0.9185	0.9200	0.9314	0.9673	0.9490	0.9614
94-97 (4)	2000	1.0941	1.1120	1.1120	1.1120	1.1120	1.0855	1.0339	1.0300	1.0368	1.0296	1.0310	1.0437	1.0842	1.0635	1.0775
89-93 (5)	1996	0.8026	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7900	0.7747	0.7754	0.7895	0.8202	0.8045	0.8149
90-94 (5)	1997	0.8227	0.8138	0.8138	0.8138	0.8138	0.8138	0.8138	0.8138	0.8097	0.7960	0.7956	0.8056	0.8367	0.8210	0.8316
91-95 (5)	1998	0.8951	0.8832	0.8832	0.8832	0.8832	0.8832	0.8832	0.8733	0.8715	0.8624	0.8670	0.8781	0.9118	0.8948	0.9065
92-96 (5)	1999	0.9573	0.9583	0.9583	0.9583	0.9583	0.9583	0.9220	0.9134	0.9140	0.9136	0.9151	0.9267	0.9622	0.9441	0.9566
93-97 (5)	2000	1.0948	1.1092	1.1092	1.1092	1.1092	1.0893	1.0444	1.0376	1.0408	1.0332	1.0347	1.0475	1.0880	1.0674	1.0816
89-94 (6)	1997	0.8490	0.8364	0.8364	0.8364	0.8364	0.8364	0.8364	0.8364	0.8331	0.8193	0.8205	0.8344	0.8667	0.8503	0.8614
90-95 (6)	1998	0.9154	0.9063	0.9063	0.9063	0.9063	0.9063	0.9063	0.8982	0.8964	0.8839	0.8841	0.8952	0.9298	0.9123	0.9242
91-96 (6)	1999	0.9413	0.9409	0.9409	0.9409	0.9409	0.9409	0.9126	0.9051	0.9050	0.8967	0.9008	0.9122	0.9473	0.9295	0.9416
92-97 (6)	2000	1.0730	1.0796	1.0796	1.0796	1.0796	1.0642	1.0265	1.0194	1.0211	1.0191	1.0206	1.0334	1.0732	1.0530	1.0670
89-95 (7)	1998	0.9332	0.9211	0.9211	0.9211	0.9211	0.9211	0.9211	0.9143	0.9126	0.8993	0.9008	0.9154	0.9508	0.9328	0.9450
90-96 (7)	1999	0.9621	0.9623	0.9623	0.9623	0.9623	0.9623	0.9383	0.9316	0.9312	0.9197	0.9204	0.9319	0.9679	0.9496	0.9620
91-97 (7)	2000	1.0508	1.0557	1.0557	1.0557	1.0557	1.0433	1.0112	1.0045	1.0054	0.9970	1.0008	1.0134	1.0524	1.0326	1.0463
89-96 (8)	1999	0.9818	0.9782	0.9782	0.9782	0.9782	0.9782	0.9575	0.9514	0.9508	0.9382	0.9398	0.9545	0.9913	0.9725	0.9853
90-97 (8)	2000	1.0634	1.0686	1.0686	1.0686	1.0686	1.0579	1.0294	1.0230	1.0235	1.0120	1.0128	1.0255	1.0651	1.0450	1.0587
89-97 (9)	2000	1.0781	1.0795	1.0795	1.0795	1.0795	1.0701	1.0445	1.0385	1.0387	1.0259	1.0276	1.0432	1.0834	1.0629	1.0770

**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)
89-92 (4)	1995	-0.0462	-0.0472	-0.0472	-0.0472	-0.0472	-0.0472	-0.0472	-0.0540	-0.0535	-0.0392	-0.0377	-0.0440	-0.0460	-0.0448	-0.0454
90-93 (4)	1996	-0.0154	-0.0097	-0.0097	-0.0097	-0.0097	-0.0097	-0.0336	-0.0353	-0.0347	-0.0230	-0.0199	-0.0202	-0.0212	-0.0207	-0.0207
91-94 (4)	1997	0.0809	0.0908	0.0908	0.0908	0.0908	0.0779	0.0641	0.0620	0.0680	0.0724	0.0684	0.0690	0.0720	0.0703	0.0714
92-95 (4)	1998	0.0024	0.0355	0.0355	0.0355	-0.0102	-0.0198	-0.0344	-0.0227	-0.0204	-0.0286	-0.0286	-0.0293	-0.0302	-0.0299	-0.0305
93-96 (4)	1999	0.0104	0.0119	0.0119	0.0040	-0.0213	-0.0315	0.0023	0.0097	0.0079	0.0080	0.0080	0.0083	0.0087	0.0085	0.0087
94-97 (4)	2000	0.0030	-0.0025	0.0056	-0.0094	-0.0377	-0.0227	0.0116	0.0131	0.0070	0.0068	0.0071	0.0072	0.0074	0.0074	0.0075
89-93 (5)	1996	-0.0449	-0.0341	-0.0341	-0.0341	-0.0341	-0.0341	-0.0580	-0.0597	-0.0591	-0.0491	-0.0485	-0.0536	-0.0559	-0.0547	-0.0553
90-94 (5)	1997	0.0420	0.0486	0.0486	0.0486	0.0486	0.0357	0.0219	0.0198	0.0247	0.0324	0.0341	0.0344	0.0358	0.0350	0.0357
91-95 (5)	1998	0.0339	0.0641	0.0641	0.0641	0.0184	0.0088	-0.0058	0.0022	0.0047	0.0075	0.0044	0.0041	0.0045	0.0041	0.0042
92-96 (5)	1999	0.0244	0.0353	0.0353	0.0274	0.0021	-0.0081	0.0128	0.0192	0.0193	0.0129	0.0129	0.0130	0.0138	0.0134	0.0135
93-97 (5)	2000	0.0023	0.0003	0.0084	-0.0066	-0.0349	-0.0265	0.0011	0.0055	0.0030	0.0032	0.0034	0.0034	0.0036	0.0035	0.0034
89-94 (6)	1997	0.0157	0.0260	0.0260	0.0260	0.0260	0.0131	-0.0007	-0.0028	0.0013	0.0091	0.0092	0.0056	0.0058	0.0057	0.0059
90-95 (6)	1998	0.0136	0.0410	0.0410	0.0410	-0.0047	-0.0143	-0.0289	-0.0227	-0.0202	-0.0140	-0.0127	-0.0130	-0.0135	-0.0134	-0.0135
91-96 (6)	1999	0.0404	0.0527	0.0527	0.0448	0.0195	0.0093	0.0222	0.0275	0.0283	0.0298	0.0272	0.0275	0.0287	0.0280	0.0285
92-97 (6)	2000	0.0241	0.0299	0.0380	0.0230	-0.0053	-0.0014	0.0190	0.0237	0.0227	0.0173	0.0175	0.0175	0.0184	0.0179	0.0180
89-95 (7)	1998	-0.0042	0.0262	0.0262	0.0262	-0.0195	-0.0291	-0.0437	-0.0388	-0.0364	-0.0294	-0.0294	-0.0332	-0.0345	-0.0339	-0.0343
90-96 (7)	1999	0.0196	0.0313	0.0313	0.0234	-0.0019	-0.0121	-0.0035	0.0010	0.0021	0.0068	0.0076	0.0078	0.0081	0.0079	0.0081
91-97 (7)	2000	0.0463	0.0538	0.0619	0.0469	0.0186	0.0195	0.0343	0.0386	0.0384	0.0394	0.0373	0.0375	0.0392	0.0383	0.0387
89-96 (8)	1999	-0.0001	0.0154	0.0154	0.0075	-0.0178	-0.0280	-0.0227	-0.0188	-0.0175	-0.0117	-0.0118	-0.0148	-0.0153	-0.0150	-0.0152
90-97 (8)	2000	0.0337	0.0409	0.0490	0.0340	0.0057	0.0049	0.0161	0.0201	0.0203	0.0244	0.0253	0.0254	0.0265	0.0259	0.0263
89-97 (9)	2000	0.0190	0.0300	0.0381	0.0231	-0.0052	-0.0073	0.0010	0.0046	0.0051	0.0105	0.0105	0.0077	0.0082	0.0080	0.0080