

DELAWARE COMPENSATION RATING BUREAU, INC.

Retrospective Test of Trend Projections for Severity Ratios – Limited Losses

Attached is a retrospective test of the predictive accuracy of various trend procedures using severity ratios, i.e., ultimate loss ratios adjusted by dividing out the frequency component. The analysis is limited to Policy Years 1992 through 2004, 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 loss ratio three years hence, were used. Our current review trends 2.9167 years beyond the midpoint of the latest available completed policy year (1/1/2005 to 12/1/2007).

Current estimates of policy year ultimate loss ratios are compared with predicted values based on trending through earlier years. The results are available for each of three loss development approaches: incurred, paid-to-20th and the average of the incurred and paid-20th methods.

As an illustration, the incurred loss development approach generated an indemnity severity ratio of 0.4050 for policy year 1999 (page 6.1). Fitting the severity ratios for policy years 1993 to 1996 using a straight line and projecting that to 1999 yielded a severity ratio of 0.3401 (page 6.2) which understates our current estimate for 1999 by 0.0649 points (page 6.3).

Indemnity
Actual Ultimate Limited Severity Ratios

INDEMNITY	Policy Year	Ult Limited Severity Ratio (Avg Pd & Inc)	Ult Limited Severity Ratio (Incur)	Ult Limited Severity Ratio (Pd-20)
	1992	0.2781	0.2726	0.2837
	1993	0.2866	0.2862	0.2869
	1994	0.2543	0.2511	0.2576
	1995	0.2754	0.2739	0.2768
	1996	0.3193	0.3209	0.3178
	1997	0.3604	0.3742	0.3467
	1998	0.3500	0.3492	0.3510
	1999	0.4031	0.4050	0.4010
	2000	0.5152	0.5370	0.4934
	2001	0.4671	0.4893	0.4446
	2002	0.4931	0.5085	0.4775
	2003	0.4901	0.5237	0.4564
	2004	0.4691	0.5298	0.4083

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-20)
1992-1995 (4)	1998	0.2554	0.2569	0.2538
1993-1996 (4)	1999	0.3375	0.3401	0.3351
1994-1997 (4)	2000	0.4653	0.4924	0.4385
1995-1998 (4)	2001	0.4455	0.4552	0.4363
1996-1999 (4)	2002	0.4667	0.4646	0.4684
1997-2000 (4)	2003	0.6401	0.6612	0.6186
1998-2001 (4)	2004	0.6424	0.6937	0.5904
1992-1996 (5)	1999	0.3183	0.3231	0.3136
1993-1997 (5)	2000	0.4055	0.4242	0.3871
1994-1998 (5)	2001	0.4501	0.4621	0.4383
1995-1999 (5)	2002	0.4847	0.4899	0.4795
1996-2000 (5)	2003	0.6069	0.6288	0.5847
1997-2001 (5)	2004	0.6085	0.6399	0.5764
1992-1997 (6)	2000	0.3791	0.3963	0.3620
1993-1998 (6)	2001	0.4144	0.4242	0.4049
1994-1999 (6)	2002	0.4856	0.4938	0.4773
1995-2000 (6)	2003	0.5969	0.6191	0.5745
1996-2001 (6)	2004	0.6000	0.6304	0.5691
1992-1998 (7)	2001	0.3952	0.4059	0.3847
1993-1999 (7)	2002	0.4554	0.4628	0.4480
1994-2000 (7)	2003	0.5830	0.6048	0.5611
1995-2001 (7)	2004	0.6007	0.6305	0.5707
1992-1999 (8)	2002	0.4362	0.4449	0.4274
1993-2000 (8)	2003	0.5474	0.5667	0.5282
1994-2001 (8)	2004	0.5948	0.6235	0.5659
1992-2000 (9)	2003	0.5217	0.5407	0.5027
1993-2001 (9)	2004	0.5680	0.5939	0.5418
1992-2001 (10)	2004	0.5469	0.5721	0.5215

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)
1992-1995 (4)	1998	0.0946	0.0923	0.0973
1993-1996 (4)	1999	0.0656	0.0649	0.0659
1994-1997 (4)	2000	0.0499	0.0446	0.0549
1995-1998 (4)	2001	0.0216	0.0341	0.0084
1996-1999 (4)	2002	0.0264	0.0439	0.0091
1997-2000 (4)	2003	-0.1500	-0.1375	-0.1622
1998-2001 (4)	2004	-0.1733	-0.1639	-0.1821
1992-1996 (5)	1999	0.0848	0.0819	0.0874
1993-1997 (5)	2000	0.1097	0.1128	0.1063
1994-1998 (5)	2001	0.0170	0.0272	0.0063
1995-1999 (5)	2002	0.0084	0.0186	-0.0020
1996-2000 (5)	2003	-0.1168	-0.1051	-0.1283
1997-2001 (5)	2004	-0.1394	-0.1101	-0.1681
1992-1997 (6)	2000	0.1361	0.1407	0.1314
1993-1998 (6)	2001	0.0527	0.0651	0.0397
1994-1999 (6)	2002	0.0075	0.0147	0.0002
1995-2000 (6)	2003	-0.1068	-0.0954	-0.1181
1996-2001 (6)	2004	-0.1309	-0.1006	-0.1608
1992-1998 (7)	2001	0.0719	0.0834	0.0599
1993-1999 (7)	2002	0.0377	0.0457	0.0295
1994-2000 (7)	2003	-0.0929	-0.0811	-0.1047
1995-2001 (7)	2004	-0.1316	-0.1007	-0.1624
1992-1999 (8)	2002	0.0569	0.0636	0.0501
1993-2000 (8)	2003	-0.0573	-0.0430	-0.0718
1994-2001 (8)	2004	-0.1257	-0.0937	-0.1576
1992-2000 (9)	2003	-0.0316	-0.0170	-0.0463
1993-2001 (9)	2004	-0.0989	-0.0641	-0.1335
1992-2001 (10)	2004	-0.0778	-0.0423	-0.1132

**Indemnity
Exponential Fit
Trended Severity Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
1992-1995 (4)	1998	0.2556	0.2568	0.2544
1993-1996 (4)	1999	0.3393	0.3421	0.3367
1994-1997 (4)	2000	0.5128	0.5547	0.4731
1995-1998 (4)	2001	0.4737	0.4869	0.4609
1996-1999 (4)	2002	0.4825	0.4791	0.4857
1997-2000 (4)	2003	0.6945	0.7147	0.6735
1998-2001 (4)	2004	0.7078	0.7860	0.6332
1992-1996 (5)	1999	0.3174	0.3225	0.3124
1993-1997 (5)	2000	0.4185	0.4410	0.3967
1994-1998 (5)	2001	0.4866	0.5046	0.4692
1995-1999 (5)	2002	0.5194	0.5269	0.5118
1996-2000 (5)	2003	0.6555	0.6804	0.6301
1997-2001 (5)	2004	0.6518	0.6895	0.6136
1992-1997 (6)	2000	0.3837	0.4033	0.3647
1993-1998 (6)	2001	0.4308	0.4431	0.4189
1994-1999 (6)	2002	0.5295	0.5427	0.5162
1995-2000 (6)	2003	0.6605	0.6901	0.6310
1996-2001 (6)	2004	0.6475	0.6859	0.6089
1992-1998 (7)	2001	0.4044	0.4176	0.3917
1993-1999 (7)	2002	0.4804	0.4907	0.4701
1994-2000 (7)	2003	0.6529	0.6845	0.6216
1995-2001 (7)	2004	0.6652	0.7064	0.6243
1992-1999 (8)	2002	0.4526	0.4646	0.4407
1993-2000 (8)	2003	0.5912	0.6163	0.5664
1994-2001 (8)	2004	0.6690	0.7113	0.6273
1992-2000 (9)	2003	0.5516	0.5761	0.5275
1993-2001 (9)	2004	0.6214	0.6568	0.5864
1992-2001 (10)	2004	0.5876	0.6215	0.5543

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)
1992-1995 (4)	1998	0.0944	0.0924	0.0966
1993-1996 (4)	1999	0.0638	0.0629	0.0643
1994-1997 (4)	2000	0.0024	-0.0177	0.0203
1995-1998 (4)	2001	-0.0066	0.0024	-0.0163
1996-1999 (4)	2002	0.0106	0.0294	-0.0082
1997-2000 (4)	2003	-0.2044	-0.1910	-0.2171
1998-2001 (4)	2004	-0.2387	-0.2562	-0.2249
1992-1996 (5)	1999	0.0857	0.0825	0.0886
1993-1997 (5)	2000	0.0967	0.0960	0.0967
1994-1998 (5)	2001	-0.0195	-0.0153	-0.0246
1995-1999 (5)	2002	-0.0263	-0.0184	-0.0343
1996-2000 (5)	2003	-0.1654	-0.1567	-0.1737
1997-2001 (5)	2004	-0.1827	-0.1597	-0.2053
1992-1997 (6)	2000	0.1315	0.1337	0.1287
1993-1998 (6)	2001	0.0363	0.0462	0.0257
1994-1999 (6)	2002	-0.0364	-0.0342	-0.0387
1995-2000 (6)	2003	-0.1704	-0.1664	-0.1746
1996-2001 (6)	2004	-0.1784	-0.1561	-0.2006
1992-1998 (7)	2001	0.0627	0.0717	0.0529
1993-1999 (7)	2002	0.0127	0.0178	0.0074
1994-2000 (7)	2003	-0.1628	-0.1608	-0.1652
1995-2001 (7)	2004	-0.1961	-0.1766	-0.2160
1992-1999 (8)	2002	0.0405	0.0439	0.0368
1993-2000 (8)	2003	-0.1011	-0.0926	-0.1100
1994-2001 (8)	2004	-0.1999	-0.1815	-0.2190
1992-2000 (9)	2003	-0.0615	-0.0524	-0.0711
1993-2001 (9)	2004	-0.1523	-0.1270	-0.1781
1992-2001 (10)	2004	-0.1185	-0.0917	-0.1460

Medical
Actual Ultimate Limited Severity Ratios

MEDICAL	Policy Year	Ult Limited Severity Ratio (Avg Pd & Inc)	Ult Limited Severity Ratio (Incur)	Ult Limited Severity Ratio (Pd-20)
	1992	0.2731	0.2755	0.2707
	1993	0.2654	0.2775	0.2534
	1994	0.2720	0.2898	0.2541
	1995	0.3011	0.3191	0.2831
	1996	0.3444	0.3752	0.3137
	1997	0.3921	0.4259	0.3582
	1998	0.4580	0.4989	0.4170
	1999	0.5416	0.5950	0.4881
	2000	0.6930	0.8083	0.5776
	2001	0.6351	0.7414	0.5285
	2002	0.7170	0.8265	0.6077
	2003	0.7787	0.8980	0.6594
	2004	0.8757	1.0265	0.7249

**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)
1992-1995 (4)	1998	0.3187	0.3549	0.2824
1993-1996 (4)	1999	0.4155	0.4605	0.3705
1994-1997 (4)	2000	0.5090	0.5615	0.4566
1995-1998 (4)	2001	0.6072	0.6703	0.5438
1996-1999 (4)	2002	0.7299	0.8033	0.6562
1997-2000 (4)	2003	0.9650	1.1415	0.7884
1998-2001 (4)	2004	0.8891	1.0843	0.6936
1992-1996 (5)	1999	0.3804	0.4279	0.3329
1993-1997 (5)	2000	0.4779	0.5286	0.4271
1994-1998 (5)	2001	0.5850	0.6443	0.5257
1995-1999 (5)	2002	0.7047	0.7806	0.6287
1996-2000 (5)	2003	0.9092	1.0583	0.7598
1997-2001 (5)	2004	0.9045	1.0841	0.7245
1992-1997 (6)	2000	0.4433	0.4960	0.3906
1993-1998 (6)	2001	0.5536	0.6113	0.4957
1994-1999 (6)	2002	0.6782	0.7498	0.6063
1995-2000 (6)	2003	0.8663	1.0032	0.7291
1996-2001 (6)	2004	0.8941	1.0572	0.7306
1992-1998 (7)	2001	0.5181	0.5772	0.4589
1993-1999 (7)	2002	0.6446	0.7140	0.5750
1994-2000 (7)	2003	0.8269	0.9512	0.7025
1995-2001 (7)	2004	0.8769	1.0310	0.7224
1992-1999 (8)	2002	0.6071	0.6768	0.5374
1993-2000 (8)	2003	0.7845	0.9000	0.6688
1994-2001 (8)	2004	0.8538	0.9973	0.7102
1992-2000 (9)	2003	0.7401	0.8505	0.6295
1993-2001 (9)	2004	0.8229	0.9580	0.6875
1992-2001 (10)	2004	0.7866	0.9163	0.6565

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)
1992-1995 (4)	1998	0.1393	0.1440	0.1346
1993-1996 (4)	1999	0.1261	0.1345	0.1176
1994-1997 (4)	2000	0.1840	0.2468	0.1210
1995-1998 (4)	2001	0.0279	0.0711	-0.0153
1996-1999 (4)	2002	-0.0129	0.0232	-0.0485
1997-2000 (4)	2003	-0.1863	-0.2435	-0.1290
1998-2001 (4)	2004	-0.0134	-0.0578	0.0313
1992-1996 (5)	1999	0.1613	0.1671	0.1553
1993-1997 (5)	2000	0.2151	0.2797	0.1505
1994-1998 (5)	2001	0.0501	0.0971	0.0028
1995-1999 (5)	2002	0.0123	0.0459	-0.0210
1996-2000 (5)	2003	-0.1305	-0.1603	-0.1004
1997-2001 (5)	2004	-0.0288	-0.0576	0.0004
1992-1997 (6)	2000	0.2497	0.3123	0.1870
1993-1998 (6)	2001	0.0815	0.1301	0.0328
1994-1999 (6)	2002	0.0388	0.0767	0.0014
1995-2000 (6)	2003	-0.0876	-0.1052	-0.0697
1996-2001 (6)	2004	-0.0184	-0.0307	-0.0057
1992-1998 (7)	2001	0.1170	0.1642	0.0696
1993-1999 (7)	2002	0.0724	0.1126	0.0327
1994-2000 (7)	2003	-0.0482	-0.0532	-0.0431
1995-2001 (7)	2004	-0.0012	-0.0045	0.0025
1992-1999 (8)	2002	0.1099	0.1497	0.0703
1993-2000 (8)	2003	-0.0058	-0.0020	-0.0094
1994-2001 (8)	2004	0.0219	0.0292	0.0148
1992-2000 (9)	2003	0.0386	0.0475	0.0299
1993-2001 (9)	2004	0.0528	0.0685	0.0374
1992-2001 (10)	2004	0.0891	0.1102	0.0684

**Medical
Exponential Fit
Trended Severity Ratios**

Years Used (# Yrs)	3 Yr Trend To	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
1992-1995 (4)	1998	0.3202	0.3605	0.2819
1993-1996 (4)	1999	0.4377	0.4915	0.3851
1994-1997 (4)	2000	0.5644	0.6306	0.4992
1995-1998 (4)	2001	0.6899	0.7730	0.6077
1996-1999 (4)	2002	0.8454	0.9339	0.7563
1997-2000 (4)	2003	1.1853	1.4536	0.9268
1998-2001 (4)	2004	0.9986	1.2725	0.7416
1992-1996 (5)	1999	0.3893	0.4459	0.3358
1993-1997 (5)	2000	0.5179	0.5817	0.4554
1994-1998 (5)	2001	0.6677	0.7450	0.5912
1995-1999 (5)	2002	0.8272	0.9300	0.7255
1996-2000 (5)	2003	1.1142	1.3263	0.9047
1997-2001 (5)	2004	1.0609	1.3226	0.8112
1992-1997 (6)	2000	0.4653	0.5319	0.4018
1993-1998 (6)	2001	0.6189	0.6948	0.5443
1994-1999 (6)	2002	0.7994	0.8967	0.7033
1995-2000 (6)	2003	1.0678	1.2695	0.8703
1996-2001 (6)	2004	1.0756	1.3119	0.8457
1992-1998 (7)	2001	0.5600	0.6389	0.4844
1993-1999 (7)	2002	0.7455	0.8405	0.6520
1994-2000 (7)	2003	1.0190	1.1990	0.8422
1995-2001 (7)	2004	1.0776	1.3109	0.8519
1992-1999 (8)	2002	0.6783	0.7756	0.5848
1993-2000 (8)	2003	0.9463	1.1113	0.7847
1994-2001 (8)	2004	1.0608	1.2777	0.8499
1992-2000 (9)	2003	0.8597	1.0173	0.7084
1993-2001 (9)	2004	1.0108	1.2137	0.8140
1992-2001 (10)	2004	0.9379	1.1321	0.7524

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)
1992-1995 (4)	1998	0.1378	0.1384	0.1351
1993-1996 (4)	1999	0.1039	0.1035	0.1030
1994-1997 (4)	2000	0.1286	0.1777	0.0784
1995-1998 (4)	2001	-0.0548	-0.0316	-0.0792
1996-1999 (4)	2002	-0.1284	-0.1074	-0.1486
1997-2000 (4)	2003	-0.4066	-0.5556	-0.2674
1998-2001 (4)	2004	-0.1229	-0.2460	-0.0167
1992-1996 (5)	1999	0.1523	0.1491	0.1523
1993-1997 (5)	2000	0.1751	0.2266	0.1222
1994-1998 (5)	2001	-0.0326	-0.0036	-0.0627
1995-1999 (5)	2002	-0.1102	-0.1035	-0.1178
1996-2000 (5)	2003	-0.3355	-0.4283	-0.2453
1997-2001 (5)	2004	-0.1852	-0.2961	-0.0863
1992-1997 (6)	2000	0.2277	0.2764	0.1758
1993-1998 (6)	2001	0.0162	0.0466	-0.0158
1994-1999 (6)	2002	-0.0824	-0.0702	-0.0956
1995-2000 (6)	2003	-0.2891	-0.3715	-0.2109
1996-2001 (6)	2004	-0.1999	-0.2854	-0.1208
1992-1998 (7)	2001	0.0751	0.1025	0.0441
1993-1999 (7)	2002	-0.0285	-0.0140	-0.0443
1994-2000 (7)	2003	-0.2403	-0.3010	-0.1828
1995-2001 (7)	2004	-0.2019	-0.2844	-0.1270
1992-1999 (8)	2002	0.0387	0.0509	0.0229
1993-2000 (8)	2003	-0.1676	-0.2133	-0.1253
1994-2001 (8)	2004	-0.1851	-0.2512	-0.1250
1992-2000 (9)	2003	-0.0810	-0.1193	-0.0490
1993-2001 (9)	2004	-0.1351	-0.1872	-0.0891
1992-2001 (10)	2004	-0.0622	-0.1056	-0.0275