

DELAWARE COMPENSATION RATING BUREAU, INC.

Retrospective Test of Trend Projections for Severity Ratios – Unlimited 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 1993 through 2005, 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 (1/1/2006 to 12/1/2008).

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 0.6071 for policy year 2000 (page 6.1). Fitting the severity ratios for policy years 1994 to 1997 using a straight line and projecting that to 2000 yielded a severity ratio of 0.5055 (page 6.2) which understates our current estimate for 2000 by 0.1016 points (page 6.3).

**Indemnity
Actual Ultimate Severity Ratios**

INDEMNITY	Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
	1993	0.3229	0.3215	0.3244
	1994	0.2810	0.2746	0.2876
	1995	0.3159	0.3089	0.3228
	1996	0.3457	0.3464	0.3452
	1997	0.3809	0.3918	0.3703
	1998	0.3703	0.3703	0.3704
	1999	0.4564	0.4522	0.4605
	2000	0.5970	0.6071	0.5868
	2001	0.5240	0.5291	0.5188
	2002	0.5792	0.5992	0.5593
	2003	0.5579	0.5707	0.5453
	2004	0.5650	0.5917	0.5381
	2005	0.5740	0.6045	0.5438

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)
1993-1996 (4)	1999	0.3629	0.3619	0.3639
1994-1997 (4)	2000	0.4792	0.5055	0.4532
1995-1998 (4)	2001	0.4425	0.4577	0.4277
1996-1999 (4)	2002	0.5330	0.5233	0.5423
1997-2000 (4)	2003	0.7816	0.7829	0.7798
1998-2001 (4)	2004	0.7577	0.7738	0.7413
1999-2002 (4)	2005	0.6721	0.7103	0.6341
1993-1997 (5)	2000	0.4196	0.4348	0.4048
1994-1998 (5)	2001	0.4606	0.4756	0.4458
1995-1999 (5)	2002	0.5266	0.5292	0.5241
1996-2000 (5)	2003	0.7191	0.7245	0.7133
1997-2001 (5)	2004	0.7222	0.7258	0.7181
1998-2002 (5)	2005	0.7481	0.7789	0.7172
1993-1998 (6)	2001	0.4251	0.4351	0.4154
1994-1999 (6)	2002	0.5274	0.5330	0.5217
1995-2000 (6)	2003	0.6824	0.6936	0.6711
1996-2001 (6)	2004	0.7012	0.7074	0.6946
1997-2002 (6)	2005	0.7350	0.7538	0.7160
1993-1999 (7)	2002	0.4913	0.4950	0.4876
1994-2000 (7)	2003	0.6611	0.6733	0.6487
1995-2001 (7)	2004	0.6848	0.6956	0.6738
1996-2002 (7)	2005	0.7248	0.7430	0.7064
1993-2000 (8)	2003	0.6154	0.6253	0.6055
1994-2001 (8)	2004	0.6742	0.6862	0.6620
1995-2002 (8)	2005	0.7146	0.7349	0.6943
1993-2001 (9)	2004	0.6394	0.6497	0.6290
1994-2002 (9)	2005	0.7073	0.7275	0.6869
1993-2002 (10)	2005	0.6780	0.6959	0.6600

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)
1993-1996 (4)	1999	0.0935	0.0903	0.0966
1994-1997 (4)	2000	0.1179	0.1016	0.1336
1995-1998 (4)	2001	0.0815	0.0714	0.0911
1996-1999 (4)	2002	0.0462	0.0759	0.0170
1997-2000 (4)	2003	-0.2237	-0.2122	-0.2345
1998-2001 (4)	2004	-0.1927	-0.1821	-0.2032
1999-2002 (4)	2005	-0.0981	-0.1058	-0.0903
1993-1997 (5)	2000	0.1774	0.1723	0.1820
1994-1998 (5)	2001	0.0634	0.0536	0.0730
1995-1999 (5)	2002	0.0526	0.0700	0.0352
1996-2000 (5)	2003	-0.1612	-0.1538	-0.1680
1997-2001 (5)	2004	-0.1572	-0.1341	-0.1800
1998-2002 (5)	2005	-0.1741	-0.1744	-0.1734
1993-1998 (6)	2001	0.0989	0.0940	0.1034
1994-1999 (6)	2002	0.0518	0.0662	0.0376
1995-2000 (6)	2003	-0.1245	-0.1229	-0.1258
1996-2001 (6)	2004	-0.1362	-0.1157	-0.1565
1997-2002 (6)	2005	-0.1610	-0.1493	-0.1722
1993-1999 (7)	2002	0.0879	0.1042	0.0717
1994-2000 (7)	2003	-0.1032	-0.1026	-0.1034
1995-2001 (7)	2004	-0.1198	-0.1039	-0.1357
1996-2002 (7)	2005	-0.1508	-0.1385	-0.1626
1993-2000 (8)	2003	-0.0575	-0.0546	-0.0602
1994-2001 (8)	2004	-0.1092	-0.0945	-0.1239
1995-2002 (8)	2005	-0.1406	-0.1304	-0.1505
1993-2001 (9)	2004	-0.0744	-0.0580	-0.0909
1994-2002 (9)	2005	-0.1333	-0.1230	-0.1431
1993-2002 (10)	2005	-0.1040	-0.0914	-0.1162

**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)
1993-1996 (4)	1999	0.3647	0.3635	0.3658
1994-1997 (4)	2000	0.5163	0.5573	0.4785
1995-1998 (4)	2001	0.4560	0.4766	0.4369
1996-1999 (4)	2002	0.5549	0.5425	0.5671
1997-2000 (4)	2003	0.8923	0.8828	0.9010
1998-2001 (4)	2004	0.8646	0.8902	0.8390
1999-2002 (4)	2005	0.6976	0.7466	0.6509
1993-1997 (5)	2000	0.4287	0.4467	0.4113
1994-1998 (5)	2001	0.4872	0.5098	0.4659
1995-1999 (5)	2002	0.5548	0.5614	0.5484
1996-2000 (5)	2003	0.7966	0.7994	0.7928
1997-2001 (5)	2004	0.7999	0.7991	0.8001
1998-2002 (5)	2005	0.8346	0.8806	0.7897
1993-1998 (6)	2001	0.4359	0.4484	0.4239
1994-1999 (6)	2002	0.5675	0.5797	0.5554
1995-2000 (6)	2003	0.7516	0.7695	0.7339
1996-2001 (6)	2004	0.7738	0.7793	0.7676
1997-2002 (6)	2005	0.8133	0.8350	0.7910
1993-1999 (7)	2002	0.5116	0.5185	0.5047
1994-2000 (7)	2003	0.7361	0.7583	0.7143
1995-2001 (7)	2004	0.7588	0.7761	0.7417
1996-2002 (7)	2005	0.8051	0.8278	0.7818
1993-2000 (8)	2003	0.6576	0.6725	0.6427
1994-2001 (8)	2004	0.7577	0.7794	0.7362
1995-2002 (8)	2005	0.7998	0.8303	0.7697
1993-2001 (9)	2004	0.6956	0.7118	0.6794
1994-2002 (9)	2005	0.8038	0.8373	0.7709
1993-2002 (10)	2005	0.7498	0.7767	0.7231

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)
1993-1996 (4)	1999	0.0917	0.0887	0.0947
1994-1997 (4)	2000	0.0807	0.0498	0.1083
1995-1998 (4)	2001	0.0680	0.0525	0.0819
1996-1999 (4)	2002	0.0243	0.0567	-0.0078
1997-2000 (4)	2003	-0.3344	-0.3121	-0.3557
1998-2001 (4)	2004	-0.2996	-0.2985	-0.3009
1999-2002 (4)	2005	-0.1236	-0.1421	-0.1071
1993-1997 (5)	2000	0.1683	0.1604	0.1755
1994-1998 (5)	2001	0.0368	0.0193	0.0529
1995-1999 (5)	2002	0.0244	0.0378	0.0109
1996-2000 (5)	2003	-0.2387	-0.2287	-0.2475
1997-2001 (5)	2004	-0.2349	-0.2074	-0.2620
1998-2002 (5)	2005	-0.2606	-0.2761	-0.2459
1993-1998 (6)	2001	0.0881	0.0807	0.0949
1994-1999 (6)	2002	0.0117	0.0195	0.0039
1995-2000 (6)	2003	-0.1937	-0.1988	-0.1886
1996-2001 (6)	2004	-0.2088	-0.1876	-0.2295
1997-2002 (6)	2005	-0.2393	-0.2305	-0.2472
1993-1999 (7)	2002	0.0676	0.0807	0.0546
1994-2000 (7)	2003	-0.1782	-0.1876	-0.1690
1995-2001 (7)	2004	-0.1938	-0.1844	-0.2036
1996-2002 (7)	2005	-0.2311	-0.2233	-0.2380
1993-2000 (8)	2003	-0.0997	-0.1018	-0.0974
1994-2001 (8)	2004	-0.1927	-0.1877	-0.1981
1995-2002 (8)	2005	-0.2258	-0.2258	-0.2259
1993-2001 (9)	2004	-0.1306	-0.1201	-0.1413
1994-2002 (9)	2005	-0.2298	-0.2328	-0.2271
1993-2002 (10)	2005	-0.1758	-0.1722	-0.1793

Medical
Actual Ultimate Severity Ratios

MEDICAL	Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
	1993	0.3152	0.3214	0.3090
	1994	0.3106	0.3108	0.3103
	1995	0.3952	0.4014	0.3888
	1996	0.3969	0.4060	0.3878
	1997	0.4511	0.4506	0.4517
	1998	0.5006	0.5096	0.4917
	1999	0.6460	0.6645	0.6272
	2000	0.8108	0.8793	0.7423
	2001	0.7235	0.7728	0.6743
	2002	0.8851	0.9461	0.8241
	2003	0.8718	0.8773	0.8666
	2004	0.9594	0.9954	0.9231
	2005	0.9859	0.9777	0.9941

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)
1993-1996 (4)	1999	0.5028	0.5149	0.4907
1994-1997 (4)	2000	0.5789	0.5830	0.5751
1995-1998 (4)	2001	0.6026	0.6080	0.5977
1996-1999 (4)	2002	0.8572	0.8832	0.8308
1997-2000 (4)	2003	1.1532	1.2745	1.0315
1998-2001 (4)	2004	1.0453	1.1585	0.9322
1999-2002 (4)	2005	1.0499	1.1479	0.9522
1993-1997 (5)	2000	0.5529	0.5548	0.5510
1994-1998 (5)	2001	0.6288	0.6391	0.6189
1995-1999 (5)	2002	0.7806	0.8013	0.7598
1996-2000 (5)	2003	1.0724	1.1623	0.9824
1997-2001 (5)	2004	1.0539	1.1624	0.9453
1998-2002 (5)	2005	1.1365	1.2451	1.0279
1993-1998 (6)	2001	0.6071	0.6145	0.5999
1994-1999 (6)	2002	0.7718	0.7931	0.7505
1995-2000 (6)	2003	0.9852	1.0585	0.9118
1996-2001 (6)	2004	1.0372	1.1284	0.9459
1997-2002 (6)	2005	1.1415	1.2510	1.0320
1993-1999 (7)	2002	0.7369	0.7541	0.7196
1994-2000 (7)	2003	0.9529	1.0179	0.8878
1995-2001 (7)	2004	0.9908	1.0709	0.9108
1996-2002 (7)	2005	1.1276	1.2258	1.0295
1993-2000 (8)	2003	0.9052	0.9606	0.8497
1994-2001 (8)	2004	0.9754	1.0491	0.9019
1995-2002 (8)	2005	1.0876	1.1773	0.9981
1993-2001 (9)	2004	0.9418	1.0071	0.8764
1994-2002 (9)	2005	1.0712	1.1553	0.9871
1993-2002 (10)	2005	1.0387	1.1154	0.9621

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)
1993-1996 (4)	1999	0.1432	0.1496	0.1365
1994-1997 (4)	2000	0.2319	0.2963	0.1672
1995-1998 (4)	2001	0.1209	0.1648	0.0766
1996-1999 (4)	2002	0.0279	0.0629	-0.0067
1997-2000 (4)	2003	-0.2814	-0.3972	-0.1649
1998-2001 (4)	2004	-0.0859	-0.1631	-0.0091
1999-2002 (4)	2005	-0.0640	-0.1702	0.0419
1993-1997 (5)	2000	0.2580	0.3245	0.1913
1994-1998 (5)	2001	0.0947	0.1337	0.0554
1995-1999 (5)	2002	0.1045	0.1448	0.0643
1996-2000 (5)	2003	-0.2006	-0.2850	-0.1158
1997-2001 (5)	2004	-0.0945	-0.1670	-0.0222
1998-2002 (5)	2005	-0.1506	-0.2674	-0.0338
1993-1998 (6)	2001	0.1164	0.1583	0.0744
1994-1999 (6)	2002	0.1133	0.1530	0.0736
1995-2000 (6)	2003	-0.1134	-0.1812	-0.0452
1996-2001 (6)	2004	-0.0778	-0.1330	-0.0228
1997-2002 (6)	2005	-0.1556	-0.2733	-0.0379
1993-1999 (7)	2002	0.1482	0.1920	0.1045
1994-2000 (7)	2003	-0.0811	-0.1406	-0.0212
1995-2001 (7)	2004	-0.0314	-0.0755	0.0123
1996-2002 (7)	2005	-0.1417	-0.2481	-0.0354
1993-2000 (8)	2003	-0.0334	-0.0833	0.0169
1994-2001 (8)	2004	-0.0160	-0.0537	0.0212
1995-2002 (8)	2005	-0.1017	-0.1996	-0.0040
1993-2001 (9)	2004	0.0176	-0.0117	0.0467
1994-2002 (9)	2005	-0.0853	-0.1776	0.0070
1993-2002 (10)	2005	-0.0528	-0.1377	0.0320

**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)
1993-1996 (4)	1999	0.5355	0.5494	0.5215
1994-1997 (4)	2000	0.6385	0.6450	0.6322
1995-1998 (4)	2001	0.6323	0.6362	0.6291
1996-1999 (4)	2002	0.9922	1.0255	0.9585
1997-2000 (4)	2003	1.4515	1.6817	1.2372
1998-2001 (4)	2004	1.2019	1.3783	1.0357
1999-2002 (4)	2005	1.1060	1.2291	0.9874
1993-1997 (5)	2000	0.5985	0.5996	0.5974
1994-1998 (5)	2001	0.6987	0.7128	0.6852
1995-1999 (5)	2002	0.8624	0.8859	0.8388
1996-2000 (5)	2003	1.3260	1.4696	1.1854
1997-2001 (5)	2004	1.2484	1.4318	1.0768
1998-2002 (5)	2005	1.3095	1.4759	1.1506
1993-1998 (6)	2001	0.6677	0.6754	0.6602
1994-1999 (6)	2002	0.8891	0.9189	0.8596
1995-2000 (6)	2003	1.1573	1.2593	1.0561
1996-2001 (6)	2004	1.2517	1.3975	1.1111
1997-2002 (6)	2005	1.3618	1.5468	1.1873
1993-1999 (7)	2002	0.8375	0.8579	0.8168
1994-2000 (7)	2003	1.1509	1.2464	1.0564
1995-2001 (7)	2004	1.1688	1.2874	1.0532
1996-2002 (7)	2005	1.3781	1.5395	1.2228
1993-2000 (8)	2003	1.0736	1.1466	1.0001
1994-2001 (8)	2004	1.1879	1.3028	1.0759
1995-2002 (8)	2005	1.3110	1.4509	1.1753
1993-2001 (9)	2004	1.1367	1.2314	1.0430
1994-2002 (9)	2005	1.3317	1.4696	1.1980
1993-2002 (10)	2005	1.2844	1.4029	1.1680

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)
1993-1996 (4)	1999	0.1105	0.1151	0.1057
1994-1997 (4)	2000	0.1723	0.2343	0.1101
1995-1998 (4)	2001	0.0912	0.1366	0.0452
1996-1999 (4)	2002	-0.1071	-0.0794	-0.1344
1997-2000 (4)	2003	-0.5797	-0.8044	-0.3706
1998-2001 (4)	2004	-0.2425	-0.3829	-0.1126
1999-2002 (4)	2005	-0.1201	-0.2514	0.0067
1993-1997 (5)	2000	0.2123	0.2797	0.1449
1994-1998 (5)	2001	0.0248	0.0600	-0.0109
1995-1999 (5)	2002	0.0227	0.0602	-0.0147
1996-2000 (5)	2003	-0.4542	-0.5923	-0.3188
1997-2001 (5)	2004	-0.2890	-0.4364	-0.1537
1998-2002 (5)	2005	-0.3236	-0.4982	-0.1565
1993-1998 (6)	2001	0.0558	0.0974	0.0141
1994-1999 (6)	2002	-0.0040	0.0272	-0.0355
1995-2000 (6)	2003	-0.2855	-0.3820	-0.1895
1996-2001 (6)	2004	-0.2923	-0.4021	-0.1880
1997-2002 (6)	2005	-0.3759	-0.5691	-0.1932
1993-1999 (7)	2002	0.0476	0.0882	0.0073
1994-2000 (7)	2003	-0.2791	-0.3691	-0.1898
1995-2001 (7)	2004	-0.2094	-0.2920	-0.1301
1996-2002 (7)	2005	-0.3922	-0.5618	-0.2287
1993-2000 (8)	2003	-0.2018	-0.2693	-0.1335
1994-2001 (8)	2004	-0.2285	-0.3074	-0.1528
1995-2002 (8)	2005	-0.3251	-0.4732	-0.1812
1993-2001 (9)	2004	-0.1773	-0.2360	-0.1199
1994-2002 (9)	2005	-0.3458	-0.4919	-0.2039
1993-2002 (10)	2005	-0.2985	-0.4252	-0.1739