

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 1995 through 2007, 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 (1/1/2008 to 12/1/2010).

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 0.7151 for policy year 2002 (page 6.1). Fitting the severity ratios for policy years 1996 to 1999 using a straight line and projecting that to 2002 yielded a severity ratio of 0.7005 (page 6.2) which understates our current estimate for 2002 by 0.0146 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)
	1995	0.4246	0.4194	0.4297
	1996	0.5021	0.4966	0.5075
	1997	0.5625	0.5676	0.5573
	1998	0.5707	0.5625	0.5791
	1999	0.6230	0.6041	0.6418
	2000	0.8380	0.8282	0.8478
	2001	0.7280	0.7164	0.7396
	2002	0.7246	0.7151	0.7341
	2003	0.7449	0.7332	0.7565
	2004	0.7123	0.6950	0.7297
	2005	0.7176	0.7099	0.7253
	2006	0.6907	0.6921	0.6893
	2007	0.7713	0.7685	0.7745

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)
1995-1998 (4)	2001	0.7394	0.7367	0.7425
1996-1999 (4)	2002	0.7315	0.7005	0.7625
1997-2000 (4)	2003	1.0440	1.0111	1.0769
1998-2001 (4)	2004	0.9990	0.9864	1.0115
1999-2002 (4)	2005	0.8161	0.8155	0.8167
2000-2003 (4)	2006	0.6317	0.6194	0.6438
2001-2004 (4)	2007	0.7154	0.6942	0.7367
1995-1999 (5)	2002	0.7693	0.7477	0.7910
1996-2000 (5)	2003	0.9854	0.9617	1.0093
1997-2001 (5)	2004	0.9636	0.9374	0.9898
1998-2002 (5)	2005	0.9033	0.8940	0.9124
1999-2003 (5)	2006	0.7969	0.7920	0.8018
2000-2004 (5)	2007	0.6323	0.6128	0.6519
1995-2000 (6)	2003	0.9699	0.9508	0.9891
1996-2001 (6)	2004	0.9530	0.9313	0.9747
1997-2002 (6)	2005	0.9098	0.8893	0.9302
1998-2003 (6)	2006	0.8723	0.8621	0.8824
1999-2004 (6)	2007	0.7542	0.7418	0.7667
1995-2001 (7)	2004	0.9590	0.9401	0.9779
1996-2002 (7)	2005	0.9211	0.9027	0.9396
1997-2003 (7)	2006	0.8902	0.8712	0.9092
1998-2004 (7)	2007	0.8249	0.8098	0.8400
1995-2002 (8)	2005	0.9396	0.9227	0.9566
1996-2003 (8)	2006	0.9091	0.8913	0.9269
1997-2004 (8)	2007	0.8516	0.8299	0.8733
1995-2003 (9)	2006	0.9325	0.9156	0.9494
1996-2004 (9)	2007	0.8774	0.8569	0.8980
1995-2004 (10)	2007	0.9061	0.8865	0.9257

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)
1995-1998 (4)	2001	-0.0114	-0.0203	-0.0029
1996-1999 (4)	2002	-0.0069	0.0146	-0.0284
1997-2000 (4)	2003	-0.2991	-0.2779	-0.3204
1998-2001 (4)	2004	-0.2867	-0.2914	-0.2818
1999-2002 (4)	2005	-0.0985	-0.1056	-0.0914
2000-2003 (4)	2006	0.0590	0.0727	0.0455
2001-2004 (4)	2007	0.0559	0.0743	0.0378
1995-1999 (5)	2002	-0.0447	-0.0326	-0.0569
1996-2000 (5)	2003	-0.2405	-0.2285	-0.2528
1997-2001 (5)	2004	-0.2513	-0.2424	-0.2601
1998-2002 (5)	2005	-0.1857	-0.1841	-0.1871
1999-2003 (5)	2006	-0.1062	-0.0999	-0.1125
2000-2004 (5)	2007	0.1390	0.1557	0.1226
1995-2000 (6)	2003	-0.2250	-0.2176	-0.2326
1996-2001 (6)	2004	-0.2407	-0.2363	-0.2450
1997-2002 (6)	2005	-0.1922	-0.1794	-0.2049
1998-2003 (6)	2006	-0.1816	-0.1700	-0.1931
1999-2004 (6)	2007	0.0171	0.0267	0.0078
1995-2001 (7)	2004	-0.2467	-0.2451	-0.2482
1996-2002 (7)	2005	-0.2035	-0.1928	-0.2143
1997-2003 (7)	2006	-0.1995	-0.1791	-0.2199
1998-2004 (7)	2007	-0.0536	-0.0413	-0.0655
1995-2002 (8)	2005	-0.2220	-0.2128	-0.2313
1996-2003 (8)	2006	-0.2184	-0.1992	-0.2376
1997-2004 (8)	2007	-0.0803	-0.0614	-0.0988
1995-2003 (9)	2006	-0.2418	-0.2235	-0.2601
1996-2004 (9)	2007	-0.1061	-0.0884	-0.1235
1995-2004 (10)	2007	-0.1348	-0.1180	-0.1512

**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)
1995-1998 (4)	2001	0.8024	0.8016	0.8037
1996-1999 (4)	2002	0.7582	0.7218	0.7954
1997-2000 (4)	2003	1.1400	1.0872	1.1945
1998-2001 (4)	2004	1.0833	1.0705	1.0957
1999-2002 (4)	2005	0.8338	0.8370	0.8312
2000-2003 (4)	2006	0.6448	0.6330	0.6564
2001-2004 (4)	2007	0.7151	0.6939	0.7365
1995-1999 (5)	2002	0.8323	0.8060	0.8587
1996-2000 (5)	2003	1.0706	1.0364	1.1054
1997-2001 (5)	2004	1.0297	0.9927	1.0675
1998-2002 (5)	2005	0.9480	0.9398	0.9560
1999-2003 (5)	2006	0.8099	0.8073	0.8128
2000-2004 (5)	2007	0.6434	0.6250	0.6618
1995-2000 (6)	2003	1.0864	1.0601	1.1128
1996-2001 (6)	2004	1.0286	0.9993	1.0582
1997-2002 (6)	2005	0.9570	0.9305	0.9840
1998-2003 (6)	2006	0.9057	0.8962	0.9149
1999-2004 (6)	2007	0.7622	0.7506	0.7739
1995-2001 (7)	2004	1.0690	1.0439	1.0943
1996-2002 (7)	2005	0.9838	0.9603	1.0077
1997-2003 (7)	2006	0.9302	0.9067	0.9540
1998-2004 (7)	2007	0.8462	0.8307	0.8617
1995-2002 (8)	2005	1.0368	1.0152	1.0587
1996-2003 (8)	2006	0.9655	0.9435	0.9878
1997-2004 (8)	2007	0.8805	0.8547	0.9066
1995-2003 (9)	2006	1.0220	1.0008	1.0432
1996-2004 (9)	2007	0.9221	0.8972	0.9472
1995-2004 (10)	2007	0.9810	0.9568	1.0056

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)
1995-1998 (4)	2001	-0.0744	-0.0852	-0.0641
1996-1999 (4)	2002	-0.0336	-0.0067	-0.0613
1997-2000 (4)	2003	-0.3951	-0.3540	-0.4380
1998-2001 (4)	2004	-0.3710	-0.3755	-0.3660
1999-2002 (4)	2005	-0.1162	-0.1271	-0.1059
2000-2003 (4)	2006	0.0459	0.0591	0.0329
2001-2004 (4)	2007	0.0562	0.0746	0.0380
1995-1999 (5)	2002	-0.1077	-0.0909	-0.1246
1996-2000 (5)	2003	-0.3257	-0.3032	-0.3489
1997-2001 (5)	2004	-0.3174	-0.2977	-0.3378
1998-2002 (5)	2005	-0.2304	-0.2299	-0.2307
1999-2003 (5)	2006	-0.1192	-0.1152	-0.1235
2000-2004 (5)	2007	0.1279	0.1435	0.1127
1995-2000 (6)	2003	-0.3415	-0.3269	-0.3563
1996-2001 (6)	2004	-0.3163	-0.3043	-0.3285
1997-2002 (6)	2005	-0.2394	-0.2206	-0.2587
1998-2003 (6)	2006	-0.2150	-0.2041	-0.2256
1999-2004 (6)	2007	0.0091	0.0179	0.0006
1995-2001 (7)	2004	-0.3567	-0.3489	-0.3646
1996-2002 (7)	2005	-0.2662	-0.2504	-0.2824
1997-2003 (7)	2006	-0.2395	-0.2146	-0.2647
1998-2004 (7)	2007	-0.0749	-0.0622	-0.0872
1995-2002 (8)	2005	-0.3192	-0.3053	-0.3334
1996-2003 (8)	2006	-0.2748	-0.2514	-0.2985
1997-2004 (8)	2007	-0.1092	-0.0862	-0.1321
1995-2003 (9)	2006	-0.3313	-0.3087	-0.3539
1996-2004 (9)	2007	-0.1508	-0.1287	-0.1727
1995-2004 (10)	2007	-0.2097	-0.1883	-0.2311

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)
	1995	0.4290	0.4367	0.4213
	1996	0.5098	0.5303	0.4892
	1997	0.5439	0.5583	0.5295
	1998	0.6454	0.6529	0.6381
	1999	0.7312	0.7633	0.6993
	2000	0.9624	1.0309	0.8941
	2001	0.8771	0.9343	0.8199
	2002	0.9573	0.9972	0.9174
	2003	1.0292	1.0883	0.9699
	2004	1.1242	1.1714	1.0770
	2005	1.1687	1.2303	1.1069
	2006	1.1403	1.1926	1.0880
	2007	1.3096	1.3639	1.2555

**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)
1995-1998 (4)	2001	0.8395	0.8490	0.8303
1996-1999 (4)	2002	0.9521	0.9833	0.9215
1997-2000 (4)	2003	1.3243	1.4390	1.2100
1998-2001 (4)	2004	1.2209	1.3457	1.0959
1999-2002 (4)	2005	1.1489	1.2037	1.0937
2000-2003 (4)	2006	1.0828	1.1185	1.0465
2001-2004 (4)	2007	1.3629	1.4089	1.3168
1995-1999 (5)	2002	0.9419	0.9762	0.9079
1996-2000 (5)	2003	1.2248	1.3102	1.1398
1997-2001 (5)	2004	1.2437	1.3529	1.1346
1998-2002 (5)	2005	1.2195	1.3055	1.1334
1999-2003 (5)	2006	1.2069	1.2710	1.1424
2000-2004 (5)	2007	1.2279	1.2619	1.1936
1995-2000 (6)	2003	1.1764	1.2536	1.0995
1996-2001 (6)	2004	1.2110	1.3026	1.1197
1997-2002 (6)	2005	1.2566	1.3424	1.1708
1998-2003 (6)	2006	1.2618	1.3483	1.1750
1999-2004 (6)	2007	1.2998	1.3552	1.2441
1995-2001 (7)	2004	1.1934	1.2793	1.1078
1996-2002 (7)	2005	1.2451	1.3233	1.1671
1997-2003 (7)	2006	1.2978	1.3857	1.2098
1998-2004 (7)	2007	1.3383	1.4137	1.2625
1995-2002 (8)	2005	1.2391	1.3162	1.1621
1996-2003 (8)	2006	1.2950	1.3775	1.2124
1997-2004 (8)	2007	1.3675	1.4470	1.2880
1995-2003 (9)	2006	1.2943	1.3762	1.2123
1996-2004 (9)	2007	1.3664	1.4435	1.2893
1995-2004 (10)	2007	1.3667	1.4448	1.2886

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)
1995-1998 (4)	2001	0.0376	0.0853	-0.0104
1996-1999 (4)	2002	0.0052	0.0139	-0.0041
1997-2000 (4)	2003	-0.2951	-0.3507	-0.2401
1998-2001 (4)	2004	-0.0967	-0.1743	-0.0189
1999-2002 (4)	2005	0.0198	0.0266	0.0132
2000-2003 (4)	2006	0.0575	0.0741	0.0415
2001-2004 (4)	2007	-0.0533	-0.0450	-0.0613
1995-1999 (5)	2002	0.0154	0.0210	0.0095
1996-2000 (5)	2003	-0.1956	-0.2219	-0.1699
1997-2001 (5)	2004	-0.1195	-0.1815	-0.0576
1998-2002 (5)	2005	-0.0508	-0.0752	-0.0265
1999-2003 (5)	2006	-0.0666	-0.0783	-0.0544
2000-2004 (5)	2007	0.0817	0.1020	0.0619
1995-2000 (6)	2003	-0.1472	-0.1653	-0.1296
1996-2001 (6)	2004	-0.0868	-0.1312	-0.0427
1997-2002 (6)	2005	-0.0879	-0.1121	-0.0639
1998-2003 (6)	2006	-0.1215	-0.1557	-0.0870
1999-2004 (6)	2007	0.0098	0.0087	0.0114
1995-2001 (7)	2004	-0.0692	-0.1079	-0.0308
1996-2002 (7)	2005	-0.0764	-0.0930	-0.0602
1997-2003 (7)	2006	-0.1575	-0.1931	-0.1218
1998-2004 (7)	2007	-0.0286	-0.0498	-0.0070
1995-2002 (8)	2005	-0.0704	-0.0859	-0.0552
1996-2003 (8)	2006	-0.1547	-0.1849	-0.1244
1997-2004 (8)	2007	-0.0579	-0.0831	-0.0325
1995-2003 (9)	2006	-0.1540	-0.1836	-0.1243
1996-2004 (9)	2007	-0.0568	-0.0796	-0.0338
1995-2004 (10)	2007	-0.0571	-0.0809	-0.0331

**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)
1995-1998 (4)	2001	0.9406	0.9494	0.9324
1996-1999 (4)	2002	1.0570	1.0873	1.0272
1997-2000 (4)	2003	1.6112	1.7968	1.4330
1998-2001 (4)	2004	1.3602	1.5458	1.1849
1999-2002 (4)	2005	1.2098	1.2699	1.1490
2000-2003 (4)	2006	1.0875	1.1202	1.0551
2001-2004 (4)	2007	1.4340	1.4735	1.3951
1995-1999 (5)	2002	1.0781	1.1207	1.0358
1996-2000 (5)	2003	1.4462	1.5597	1.3340
1997-2001 (5)	2004	1.4503	1.6159	1.2908
1998-2002 (5)	2005	1.3396	1.4583	1.2237
1999-2003 (5)	2006	1.2709	1.3404	1.2008
2000-2004 (5)	2007	1.2485	1.2770	1.2208
1995-2000 (6)	2003	1.4125	1.5208	1.3056
1996-2001 (6)	2004	1.4159	1.5426	1.2914
1997-2002 (6)	2005	1.4475	1.5714	1.3259
1998-2003 (6)	2006	1.3816	1.4968	1.2682
1999-2004 (6)	2007	1.3771	1.4348	1.3190
1995-2001 (7)	2004	1.4331	1.5585	1.3100
1996-2002 (7)	2005	1.4543	1.5611	1.3485
1997-2003 (7)	2006	1.4879	1.6120	1.3657
1998-2004 (7)	2007	1.4700	1.5685	1.3723
1995-2002 (8)	2005	1.4921	1.6049	1.3808
1996-2003 (8)	2006	1.5136	1.6268	1.4014
1997-2004 (8)	2007	1.5696	1.6802	1.4600
1995-2003 (9)	2006	1.5629	1.6834	1.4438
1996-2004 (9)	2007	1.6033	1.7087	1.4984
1995-2004 (10)	2007	1.6582	1.7732	1.5442

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)
1995-1998 (4)	2001	-0.0635	-0.0151	-0.1125
1996-1999 (4)	2002	-0.0997	-0.0901	-0.1098
1997-2000 (4)	2003	-0.5820	-0.7085	-0.4631
1998-2001 (4)	2004	-0.2360	-0.3744	-0.1079
1999-2002 (4)	2005	-0.0411	-0.0396	-0.0421
2000-2003 (4)	2006	0.0528	0.0724	0.0329
2001-2004 (4)	2007	-0.1244	-0.1096	-0.1396
1995-1999 (5)	2002	-0.1208	-0.1235	-0.1184
1996-2000 (5)	2003	-0.4170	-0.4714	-0.3641
1997-2001 (5)	2004	-0.3261	-0.4445	-0.2138
1998-2002 (5)	2005	-0.1709	-0.2280	-0.1168
1999-2003 (5)	2006	-0.1306	-0.1478	-0.1128
2000-2004 (5)	2007	0.0611	0.0869	0.0347
1995-2000 (6)	2003	-0.3833	-0.4325	-0.3357
1996-2001 (6)	2004	-0.2917	-0.3712	-0.2144
1997-2002 (6)	2005	-0.2788	-0.3411	-0.2190
1998-2003 (6)	2006	-0.2413	-0.3042	-0.1802
1999-2004 (6)	2007	-0.0675	-0.0709	-0.0635
1995-2001 (7)	2004	-0.3089	-0.3871	-0.2330
1996-2002 (7)	2005	-0.2856	-0.3308	-0.2416
1997-2003 (7)	2006	-0.3476	-0.4194	-0.2777
1998-2004 (7)	2007	-0.1604	-0.2046	-0.1168
1995-2002 (8)	2005	-0.3234	-0.3746	-0.2739
1996-2003 (8)	2006	-0.3733	-0.4342	-0.3134
1997-2004 (8)	2007	-0.2600	-0.3163	-0.2045
1995-2003 (9)	2006	-0.4226	-0.4908	-0.3558
1996-2004 (9)	2007	-0.2937	-0.3448	-0.2429
1995-2004 (10)	2007	-0.3486	-0.4093	-0.2887