

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 1994 through 2006, 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 (1/1/2007 to 12/1/2009).

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 0.5862 for policy year 2001 (page 6.1). Fitting the severity ratios for policy years 1995 to 1998 using a straight line and projecting that to 2001 yielded a severity ratio of 0.5761 (page 6.2) which understates our current estimate for 2001 by 0.0101 points (page 6.3).

**Indemnity
Actual Ultimate Severity Ratios**

INDEMNITY	Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
	1994	0.3404	0.3368	0.3440
	1995	0.3496	0.3426	0.3566
	1996	0.4015	0.3968	0.4061
	1997	0.4588	0.4720	0.4455
	1998	0.4419	0.4387	0.4451
	1999	0.5057	0.5005	0.5110
	2000	0.6678	0.6742	0.6616
	2001	0.5849	0.5862	0.5836
	2002	0.6266	0.6376	0.6155
	2003	0.6079	0.6057	0.6100
	2004	0.6165	0.6287	0.6042
	2005	0.5994	0.6219	0.5772
	2006	0.6108	0.6021	0.6193

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)
1994-1997 (4)	2000	0.5708	0.5940	0.5474
1995-1998 (4)	2001	0.5633	0.5761	0.5505
1996-1999 (4)	2002	0.5850	0.5770	0.5934
1997-2000 (4)	2003	0.8294	0.8221	0.8372
1998-2001 (4)	2004	0.8161	0.8272	0.8051
1999-2002 (4)	2005	0.7222	0.7451	0.6989
2000-2003 (4)	2006	0.5597	0.5566	0.5624
1994-1998 (5)	2001	0.5545	0.5640	0.5450
1995-1999 (5)	2002	0.6078	0.6090	0.6068
1996-2000 (5)	2003	0.7849	0.7881	0.7821
1997-2001 (5)	2004	0.7709	0.7663	0.7757
1998-2002 (5)	2005	0.7897	0.8092	0.7701
1999-2003 (5)	2006	0.6802	0.6877	0.6723
1994-1999 (6)	2002	0.5987	0.6003	0.5972
1995-2000 (6)	2003	0.7674	0.7750	0.7600
1996-2001 (6)	2004	0.7628	0.7652	0.7605
1997-2002 (6)	2005	0.7723	0.7785	0.7662
1998-2003 (6)	2006	0.7469	0.7558	0.7377
1994-2000 (7)	2003	0.7383	0.7452	0.7315
1995-2001 (7)	2004	0.7626	0.7689	0.7565
1996-2002 (7)	2005	0.7739	0.7836	0.7643
1997-2003 (7)	2006	0.7482	0.7488	0.7475
1994-2001 (8)	2004	0.7473	0.7534	0.7413
1995-2002 (8)	2005	0.7791	0.7909	0.7673
1996-2003 (8)	2006	0.7594	0.7639	0.7548
1994-2002 (9)	2005	0.7699	0.7810	0.7589
1995-2003 (9)	2006	0.7712	0.7783	0.7640
1994-2003 (10)	2006	0.7692	0.7764	0.7619

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)
1994-1997 (4)	2000	0.0970	0.0802	0.1143
1995-1998 (4)	2001	0.0216	0.0101	0.0331
1996-1999 (4)	2002	0.0416	0.0606	0.0221
1997-2000 (4)	2003	-0.2215	-0.2164	-0.2272
1998-2001 (4)	2004	-0.1996	-0.1985	-0.2009
1999-2002 (4)	2005	-0.1228	-0.1232	-0.1217
2000-2003 (4)	2006	0.0511	0.0455	0.0569
1994-1998 (5)	2001	0.0304	0.0222	0.0386
1995-1999 (5)	2002	0.0188	0.0286	0.0087
1996-2000 (5)	2003	-0.1770	-0.1824	-0.1721
1997-2001 (5)	2004	-0.1544	-0.1376	-0.1715
1998-2002 (5)	2005	-0.1903	-0.1873	-0.1929
1999-2003 (5)	2006	-0.0694	-0.0856	-0.0530
1994-1999 (6)	2002	0.0279	0.0373	0.0183
1995-2000 (6)	2003	-0.1595	-0.1693	-0.1500
1996-2001 (6)	2004	-0.1463	-0.1365	-0.1563
1997-2002 (6)	2005	-0.1729	-0.1566	-0.1890
1998-2003 (6)	2006	-0.1361	-0.1537	-0.1184
1994-2000 (7)	2003	-0.1304	-0.1395	-0.1215
1995-2001 (7)	2004	-0.1461	-0.1402	-0.1523
1996-2002 (7)	2005	-0.1745	-0.1617	-0.1871
1997-2003 (7)	2006	-0.1374	-0.1467	-0.1282
1994-2001 (8)	2004	-0.1308	-0.1247	-0.1371
1995-2002 (8)	2005	-0.1797	-0.1690	-0.1901
1996-2003 (8)	2006	-0.1486	-0.1618	-0.1355
1994-2002 (9)	2005	-0.1705	-0.1591	-0.1817
1995-2003 (9)	2006	-0.1604	-0.1762	-0.1447
1994-2003 (10)	2006	-0.1584	-0.1743	-0.1426

**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)
1994-1997 (4)	2000	0.6127	0.6460	0.5802
1995-1998 (4)	2001	0.5984	0.6184	0.5789
1996-1999 (4)	2002	0.6048	0.5961	0.6139
1997-2000 (4)	2003	0.9022	0.8828	0.9235
1998-2001 (4)	2004	0.8994	0.9178	0.8815
1999-2002 (4)	2005	0.7463	0.7759	0.7172
2000-2003 (4)	2006	0.5643	0.5617	0.5664
1994-1998 (5)	2001	0.5883	0.6022	0.5743
1995-1999 (5)	2002	0.6498	0.6549	0.6449
1996-2000 (5)	2003	0.8510	0.8541	0.8487
1997-2001 (5)	2004	0.8234	0.8126	0.8353
1998-2002 (5)	2005	0.8528	0.8816	0.8245
1999-2003 (5)	2006	0.6941	0.7036	0.6842
1994-1999 (6)	2002	0.6414	0.6462	0.6367
1995-2000 (6)	2003	0.8498	0.8639	0.8364
1996-2001 (6)	2004	0.8232	0.8260	0.8209
1997-2002 (6)	2005	0.8241	0.8288	0.8197
1998-2003 (6)	2006	0.7894	0.8022	0.7764
1994-2000 (7)	2003	0.8142	0.8265	0.8023
1995-2001 (7)	2004	0.8433	0.8551	0.8321
1996-2002 (7)	2005	0.8368	0.8496	0.8244
1997-2003 (7)	2006	0.7899	0.7883	0.7917
1994-2001 (8)	2004	0.8286	0.8398	0.8176
1995-2002 (8)	2005	0.8634	0.8828	0.8446
1996-2003 (8)	2006	0.8146	0.8203	0.8090
1994-2002 (9)	2005	0.8586	0.8769	0.8407
1995-2003 (9)	2006	0.8486	0.8608	0.8367
1994-2003 (10)	2006	0.8550	0.8676	0.8425

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)
1994-1997 (4)	2000	0.0551	0.0282	0.0814
1995-1998 (4)	2001	-0.0135	-0.0322	0.0047
1996-1999 (4)	2002	0.0218	0.0415	0.0016
1997-2000 (4)	2003	-0.2943	-0.2771	-0.3135
1998-2001 (4)	2004	-0.2829	-0.2891	-0.2773
1999-2002 (4)	2005	-0.1469	-0.1540	-0.1400
2000-2003 (4)	2006	0.0465	0.0404	0.0529
1994-1998 (5)	2001	-0.0034	-0.0160	0.0093
1995-1999 (5)	2002	-0.0232	-0.0173	-0.0294
1996-2000 (5)	2003	-0.2431	-0.2484	-0.2387
1997-2001 (5)	2004	-0.2069	-0.1839	-0.2311
1998-2002 (5)	2005	-0.2534	-0.2597	-0.2473
1999-2003 (5)	2006	-0.0833	-0.1015	-0.0649
1994-1999 (6)	2002	-0.0148	-0.0086	-0.0212
1995-2000 (6)	2003	-0.2419	-0.2582	-0.2264
1996-2001 (6)	2004	-0.2067	-0.1973	-0.2167
1997-2002 (6)	2005	-0.2247	-0.2069	-0.2425
1998-2003 (6)	2006	-0.1786	-0.2001	-0.1571
1994-2000 (7)	2003	-0.2063	-0.2208	-0.1923
1995-2001 (7)	2004	-0.2268	-0.2264	-0.2279
1996-2002 (7)	2005	-0.2374	-0.2277	-0.2472
1997-2003 (7)	2006	-0.1791	-0.1862	-0.1724
1994-2001 (8)	2004	-0.2121	-0.2111	-0.2134
1995-2002 (8)	2005	-0.2640	-0.2609	-0.2674
1996-2003 (8)	2006	-0.2038	-0.2182	-0.1897
1994-2002 (9)	2005	-0.2592	-0.2550	-0.2635
1995-2003 (9)	2006	-0.2378	-0.2587	-0.2174
1994-2003 (10)	2006	-0.2442	-0.2655	-0.2232

Medical
Actual Ultimate Severity Ratios

MEDICAL	Policy Year	Severity Ratio (Avg Pd & Inc)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
	1994	0.4089	0.4187	0.3992
	1995	0.4493	0.4518	0.4468
	1996	0.4771	0.4738	0.4803
	1997	0.5473	0.5504	0.5441
	1998	0.6173	0.6181	0.6164
	1999	0.7256	0.7318	0.7194
	2000	0.9513	1.0220	0.8808
	2001	0.8504	0.8902	0.8105
	2002	0.9893	1.0122	0.9662
	2003	0.9917	1.0053	0.9781
	2004	1.1231	1.1777	1.0687
	2005	1.1109	1.1207	1.1013
	2006	1.1060	1.0975	1.1145

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)
1994-1997 (4)	2000	0.6700	0.6614	0.6783
1995-1998 (4)	2001	0.7811	0.7825	0.7796
1996-1999 (4)	2002	0.9588	0.9723	0.9454
1997-2000 (4)	2003	1.3045	1.4184	1.1911
1998-2001 (4)	2004	1.2024	1.3135	1.0914
1999-2002 (4)	2005	1.1897	1.2333	1.1458
2000-2003 (4)	2006	1.0627	1.0148	1.1103
1994-1998 (5)	2001	0.7574	0.7513	0.7632
1995-1999 (5)	2002	0.9097	0.9173	0.9021
1996-2000 (5)	2003	1.2271	1.3181	1.1364
1997-2001 (5)	2004	1.2085	1.3043	1.1128
1998-2002 (5)	2005	1.2612	1.3282	1.1940
1999-2003 (5)	2006	1.1868	1.2009	1.1724
1994-1999 (6)	2002	0.8767	0.8772	0.8759
1995-2000 (6)	2003	1.1506	1.2216	1.0797
1996-2001 (6)	2004	1.1956	1.2817	1.1096
1997-2002 (6)	2005	1.2728	1.3408	1.2048
1998-2003 (6)	2006	1.2569	1.2956	1.2181
1994-2000 (7)	2003	1.0938	1.1483	1.0395
1995-2001 (7)	2004	1.1590	1.2325	1.0856
1996-2002 (7)	2005	1.2676	1.3352	1.2000
1997-2003 (7)	2006	1.2823	1.3281	1.2364
1994-2001 (8)	2004	1.1249	1.1857	1.0640
1995-2002 (8)	2005	1.2400	1.3017	1.1783
1996-2003 (8)	2006	1.2901	1.3402	1.2400
1994-2002 (9)	2005	1.2112	1.2649	1.1573
1995-2003 (9)	2006	1.2753	1.3238	1.2269
1994-2003 (10)	2006	1.2559	1.2998	1.2119

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)
1994-1997 (4)	2000	0.2813	0.3606	0.2025
1995-1998 (4)	2001	0.0693	0.1077	0.0309
1996-1999 (4)	2002	0.0305	0.0399	0.0208
1997-2000 (4)	2003	-0.3128	-0.4131	-0.2130
1998-2001 (4)	2004	-0.0793	-0.1358	-0.0227
1999-2002 (4)	2005	-0.0788	-0.1126	-0.0445
2000-2003 (4)	2006	0.0433	0.0827	0.0042
1994-1998 (5)	2001	0.0930	0.1389	0.0473
1995-1999 (5)	2002	0.0796	0.0949	0.0641
1996-2000 (5)	2003	-0.2354	-0.3128	-0.1583
1997-2001 (5)	2004	-0.0854	-0.1266	-0.0441
1998-2002 (5)	2005	-0.1503	-0.2075	-0.0927
1999-2003 (5)	2006	-0.0808	-0.1034	-0.0579
1994-1999 (6)	2002	0.1126	0.1350	0.0903
1995-2000 (6)	2003	-0.1589	-0.2163	-0.1016
1996-2001 (6)	2004	-0.0725	-0.1040	-0.0409
1997-2002 (6)	2005	-0.1619	-0.2201	-0.1035
1998-2003 (6)	2006	-0.1509	-0.1981	-0.1036
1994-2000 (7)	2003	-0.1021	-0.1430	-0.0614
1995-2001 (7)	2004	-0.0359	-0.0548	-0.0169
1996-2002 (7)	2005	-0.1567	-0.2145	-0.0987
1997-2003 (7)	2006	-0.1763	-0.2306	-0.1219
1994-2001 (8)	2004	-0.0018	-0.0080	0.0047
1995-2002 (8)	2005	-0.1291	-0.1810	-0.0770
1996-2003 (8)	2006	-0.1841	-0.2427	-0.1255
1994-2002 (9)	2005	-0.1003	-0.1442	-0.0560
1995-2003 (9)	2006	-0.1693	-0.2263	-0.1124
1994-2003 (10)	2006	-0.1499	-0.2023	-0.0974

**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)
1994-1997 (4)	2000	0.7127	0.6965	0.7291
1995-1998 (4)	2001	0.8473	0.8484	0.8459
1996-1999 (4)	2002	1.0873	1.1104	1.0648
1997-2000 (4)	2003	1.5763	1.7670	1.3946
1998-2001 (4)	2004	1.3506	1.5232	1.1890
1999-2002 (4)	2005	1.2613	1.3193	1.2039
2000-2003 (4)	2006	1.0687	1.0164	1.1299
1994-1998 (5)	2001	0.8242	0.8107	0.8378
1995-1999 (5)	2002	1.0191	1.0292	1.0089
1996-2000 (5)	2003	1.4798	1.6291	1.3360
1997-2001 (5)	2004	1.3957	1.5453	1.2526
1998-2002 (5)	2005	1.4131	1.5160	1.3128
1999-2003 (5)	2006	1.2481	1.2647	1.2323
1994-1999 (6)	2002	0.9821	0.9765	0.9876
1995-2000 (6)	2003	1.3589	1.4616	1.2570
1996-2001 (6)	2004	1.4150	1.5555	1.2803
1997-2002 (6)	2005	1.4730	1.5804	1.3678
1998-2003 (6)	2006	1.3891	1.4453	1.3333
1994-2000 (7)	2003	1.2811	1.3461	1.2141
1995-2001 (7)	2004	1.3705	1.4831	1.2604
1996-2002 (7)	2005	1.5098	1.6237	1.3989
1997-2003 (7)	2006	1.4688	1.5387	1.3991
1994-2001 (8)	2004	1.3324	1.4150	1.2494
1995-2002 (8)	2005	1.4857	1.5855	1.3874
1996-2003 (8)	2006	1.5274	1.6111	1.4449
1994-2002 (9)	2005	1.4595	1.5376	1.3809
1995-2003 (9)	2006	1.5296	1.6087	1.4509
1994-2003 (10)	2006	1.5228	1.5879	1.4570

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)
1994-1997 (4)	2000	0.2386	0.3255	0.1517
1995-1998 (4)	2001	0.0031	0.0418	-0.0354
1996-1999 (4)	2002	-0.0980	-0.0982	-0.0986
1997-2000 (4)	2003	-0.5846	-0.7617	-0.4165
1998-2001 (4)	2004	-0.2275	-0.3455	-0.1203
1999-2002 (4)	2005	-0.1504	-0.1986	-0.1026
2000-2003 (4)	2006	0.0373	0.0811	-0.0154
1994-1998 (5)	2001	0.0262	0.0795	-0.0273
1995-1999 (5)	2002	-0.0298	-0.0170	-0.0427
1996-2000 (5)	2003	-0.4881	-0.6238	-0.3579
1997-2001 (5)	2004	-0.2726	-0.3676	-0.1839
1998-2002 (5)	2005	-0.3022	-0.3953	-0.2115
1999-2003 (5)	2006	-0.1421	-0.1672	-0.1178
1994-1999 (6)	2002	0.0072	0.0357	-0.0214
1995-2000 (6)	2003	-0.3672	-0.4563	-0.2789
1996-2001 (6)	2004	-0.2919	-0.3778	-0.2116
1997-2002 (6)	2005	-0.3621	-0.4597	-0.2665
1998-2003 (6)	2006	-0.2831	-0.3478	-0.2188
1994-2000 (7)	2003	-0.2894	-0.3408	-0.2360
1995-2001 (7)	2004	-0.2474	-0.3054	-0.1917
1996-2002 (7)	2005	-0.3989	-0.5030	-0.2976
1997-2003 (7)	2006	-0.3628	-0.4412	-0.2846
1994-2001 (8)	2004	-0.2093	-0.2373	-0.1807
1995-2002 (8)	2005	-0.3748	-0.4648	-0.2861
1996-2003 (8)	2006	-0.4214	-0.5136	-0.3304
1994-2002 (9)	2005	-0.3486	-0.4169	-0.2796
1995-2003 (9)	2006	-0.4236	-0.5112	-0.3364
1994-2003 (10)	2006	-0.4168	-0.4904	-0.3425