

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 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 0.5650 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 0.4601 (page 6.2) which understates our current estimate for 2000 by 0.1049 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)
	1993	0.3001	0.3019	0.2983
	1994	0.2648	0.2613	0.2681
	1995	0.2861	0.2801	0.2921
	1996	0.3261	0.3287	0.3236
	1997	0.3521	0.3584	0.3459
	1998	0.3488	0.3518	0.3459
	1999	0.4205	0.4189	0.4220
	2000	0.5559	0.5650	0.5466
	2001	0.4921	0.5008	0.4833
	2002	0.5117	0.5322	0.4912
	2003	0.5240	0.5414	0.5066
	2004	0.5146	0.5351	0.4938
	2005	0.5325	0.5674	0.4977

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	0.3390	0.3376	0.3405
1994-1997 (4)	2000	0.4431	0.4601	0.4266
1995-1998 (4)	2001	0.4246	0.4399	0.4095
1996-1999 (4)	2002	0.4878	0.4833	0.4922
1997-2000 (4)	2003	0.7267	0.7326	0.7203
1998-2001 (4)	2004	0.7087	0.7260	0.6910
1999-2002 (4)	2005	0.5895	0.6283	0.5507
1993-1997 (5)	2000	0.3885	0.3963	0.3810
1994-1998 (5)	2001	0.4326	0.4457	0.4198
1995-1999 (5)	2002	0.4925	0.4979	0.4870
1996-2000 (5)	2003	0.6647	0.6711	0.6579
1997-2001 (5)	2004	0.6774	0.6880	0.6665
1998-2002 (5)	2005	0.6645	0.6951	0.6338
1993-1998 (6)	2001	0.3987	0.4063	0.3913
1994-1999 (6)	2002	0.4890	0.4955	0.4827
1995-2000 (6)	2003	0.6376	0.6492	0.6257
1996-2001 (6)	2004	0.6537	0.6638	0.6433
1997-2002 (6)	2005	0.6611	0.6843	0.6377
1993-1999 (7)	2002	0.4559	0.4595	0.4524
1994-2000 (7)	2003	0.6145	0.6260	0.6029
1995-2001 (7)	2004	0.6429	0.6566	0.6290
1996-2002 (7)	2005	0.6533	0.6741	0.6323
1993-2000 (8)	2003	0.5722	0.5807	0.5636
1994-2001 (8)	2004	0.6300	0.6435	0.6163
1995-2002 (8)	2005	0.6509	0.6733	0.6284
1993-2001 (9)	2004	0.5973	0.6083	0.5863
1994-2002 (9)	2005	0.6443	0.6655	0.6229
1993-2002 (10)	2005	0.6187	0.6371	0.6003

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	0.0815	0.0813	0.0815
1994-1997 (4)	2000	0.1128	0.1049	0.1200
1995-1998 (4)	2001	0.0675	0.0609	0.0738
1996-1999 (4)	2002	0.0239	0.0490	-0.0010
1997-2000 (4)	2003	-0.2027	-0.1912	-0.2137
1998-2001 (4)	2004	-0.1941	-0.1909	-0.1972
1999-2002 (4)	2005	-0.0570	-0.0609	-0.0530
1993-1997 (5)	2000	0.1674	0.1687	0.1657
1994-1998 (5)	2001	0.0595	0.0551	0.0635
1995-1999 (5)	2002	0.0192	0.0343	0.0043
1996-2000 (5)	2003	-0.1407	-0.1297	-0.1513
1997-2001 (5)	2004	-0.1628	-0.1529	-0.1727
1998-2002 (5)	2005	-0.1320	-0.1277	-0.1361
1993-1998 (6)	2001	0.0934	0.0945	0.0920
1994-1999 (6)	2002	0.0227	0.0367	0.0085
1995-2000 (6)	2003	-0.1136	-0.1078	-0.1191
1996-2001 (6)	2004	-0.1391	-0.1287	-0.1495
1997-2002 (6)	2005	-0.1286	-0.1169	-0.1400
1993-1999 (7)	2002	0.0558	0.0727	0.0388
1994-2000 (7)	2003	-0.0905	-0.0846	-0.0963
1995-2001 (7)	2004	-0.1283	-0.1215	-0.1352
1996-2002 (7)	2005	-0.1208	-0.1067	-0.1346
1993-2000 (8)	2003	-0.0482	-0.0393	-0.0570
1994-2001 (8)	2004	-0.1154	-0.1084	-0.1225
1995-2002 (8)	2005	-0.1184	-0.1059	-0.1307
1993-2001 (9)	2004	-0.0827	-0.0732	-0.0925
1994-2002 (9)	2005	-0.1118	-0.0981	-0.1252
1993-2002 (10)	2005	-0.0862	-0.0697	-0.1026

**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	0.3399	0.3378	0.3421
1994-1997 (4)	2000	0.4759	0.5017	0.4520
1995-1998 (4)	2001	0.4425	0.4642	0.4222
1996-1999 (4)	2002	0.5056	0.4994	0.5116
1997-2000 (4)	2003	0.8294	0.8312	0.8267
1998-2001 (4)	2004	0.8076	0.8328	0.7820
1999-2002 (4)	2005	0.6077	0.6558	0.5618
1993-1997 (5)	2000	0.3962	0.4050	0.3878
1994-1998 (5)	2001	0.4583	0.4776	0.4403
1995-1999 (5)	2002	0.5229	0.5332	0.5129
1996-2000 (5)	2003	0.7319	0.7370	0.7261
1997-2001 (5)	2004	0.7527	0.7640	0.7407
1998-2002 (5)	2005	0.7296	0.7723	0.6875
1993-1998 (6)	2001	0.4091	0.4183	0.4003
1994-1999 (6)	2002	0.5263	0.5382	0.5150
1995-2000 (6)	2003	0.7069	0.7261	0.6880
1996-2001 (6)	2004	0.7198	0.7311	0.7079
1997-2002 (6)	2005	0.7249	0.7546	0.6948
1993-1999 (7)	2002	0.4749	0.4805	0.4695
1994-2000 (7)	2003	0.6841	0.7037	0.6650
1995-2001 (7)	2004	0.7174	0.7393	0.6958
1996-2002 (7)	2005	0.7180	0.7446	0.6909
1993-2000 (8)	2003	0.6114	0.6232	0.5997
1994-2001 (8)	2004	0.7089	0.7315	0.6868
1995-2002 (8)	2005	0.7275	0.7614	0.6942
1993-2001 (9)	2004	0.6504	0.6661	0.6349
1994-2002 (9)	2005	0.7287	0.7624	0.6958
1993-2002 (10)	2005	0.6820	0.7080	0.6563

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	0.0806	0.0811	0.0799
1994-1997 (4)	2000	0.0800	0.0633	0.0946
1995-1998 (4)	2001	0.0496	0.0366	0.0611
1996-1999 (4)	2002	0.0061	0.0328	-0.0204
1997-2000 (4)	2003	-0.3054	-0.2898	-0.3201
1998-2001 (4)	2004	-0.2930	-0.2977	-0.2882
1999-2002 (4)	2005	-0.0752	-0.0884	-0.0641
1993-1997 (5)	2000	0.1597	0.1600	0.1588
1994-1998 (5)	2001	0.0338	0.0232	0.0430
1995-1999 (5)	2002	-0.0112	-0.0010	-0.0217
1996-2000 (5)	2003	-0.2079	-0.1956	-0.2195
1997-2001 (5)	2004	-0.2381	-0.2289	-0.2469
1998-2002 (5)	2005	-0.1971	-0.2049	-0.1898
1993-1998 (6)	2001	0.0830	0.0825	0.0830
1994-1999 (6)	2002	-0.0146	-0.0060	-0.0238
1995-2000 (6)	2003	-0.1829	-0.1847	-0.1814
1996-2001 (6)	2004	-0.2052	-0.1960	-0.2141
1997-2002 (6)	2005	-0.1924	-0.1872	-0.1971
1993-1999 (7)	2002	0.0368	0.0517	0.0217
1994-2000 (7)	2003	-0.1601	-0.1623	-0.1584
1995-2001 (7)	2004	-0.2028	-0.2042	-0.2020
1996-2002 (7)	2005	-0.1855	-0.1772	-0.1932
1993-2000 (8)	2003	-0.0874	-0.0818	-0.0931
1994-2001 (8)	2004	-0.1943	-0.1964	-0.1930
1995-2002 (8)	2005	-0.1950	-0.1940	-0.1965
1993-2001 (9)	2004	-0.1358	-0.1310	-0.1411
1994-2002 (9)	2005	-0.1962	-0.1950	-0.1981
1993-2002 (10)	2005	-0.1495	-0.1406	-0.1586

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)
	1993	0.2396	0.2453	0.2340
	1994	0.2452	0.2528	0.2375
	1995	0.2789	0.2817	0.2762
	1996	0.3158	0.3338	0.2979
	1997	0.3416	0.3487	0.3344
	1998	0.3952	0.4149	0.3756
	1999	0.4814	0.5022	0.4605
	2000	0.6306	0.6947	0.5664
	2001	0.5680	0.6214	0.5147
	2002	0.6389	0.6924	0.5853
	2003	0.6902	0.7331	0.6474
	2004	0.7318	0.7680	0.6957
	2005	0.7805	0.8158	0.7454

**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	0.3879	0.4109	0.3651
1994-1997 (4)	2000	0.4421	0.4572	0.4271
1995-1998 (4)	2001	0.5015	0.5313	0.4716
1996-1999 (4)	2002	0.6312	0.6570	0.6052
1997-2000 (4)	2003	0.8911	0.9965	0.7856
1998-2001 (4)	2004	0.8192	0.9237	0.7147
1999-2002 (4)	2005	0.7642	0.8515	0.6769
1993-1997 (5)	2000	0.4215	0.4364	0.4066
1994-1998 (5)	2001	0.4967	0.5220	0.4715
1995-1999 (5)	2002	0.6048	0.6373	0.5721
1996-2000 (5)	2003	0.8176	0.8965	0.7385
1997-2001 (5)	2004	0.8275	0.9290	0.7260
1998-2002 (5)	2005	0.8298	0.9222	0.7373
1993-1998 (6)	2001	0.4762	0.4995	0.4529
1994-1999 (6)	2002	0.5875	0.6168	0.5582
1995-2000 (6)	2003	0.7701	0.8436	0.6963
1996-2001 (6)	2004	0.8034	0.8888	0.7180
1997-2002 (6)	2005	0.8478	0.9434	0.7522
1993-1999 (7)	2002	0.5614	0.5889	0.5339
1994-2000 (7)	2003	0.7357	0.8001	0.6711
1995-2001 (7)	2004	0.7809	0.8627	0.6991
1996-2002 (7)	2005	0.8368	0.9228	0.7507
1993-2000 (8)	2003	0.6982	0.7563	0.6400
1994-2001 (8)	2004	0.7606	0.8349	0.6863
1995-2002 (8)	2005	0.8226	0.9070	0.7381
1993-2001 (9)	2004	0.7331	0.8017	0.6645
1994-2002 (9)	2005	0.8075	0.8864	0.7285
1993-2002 (10)	2005	0.7845	0.8588	0.7102

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	0.0935	0.0913	0.0954
1994-1997 (4)	2000	0.1885	0.2375	0.1393
1995-1998 (4)	2001	0.0665	0.0901	0.0431
1996-1999 (4)	2002	0.0077	0.0354	-0.0198
1997-2000 (4)	2003	-0.2009	-0.2634	-0.1382
1998-2001 (4)	2004	-0.0874	-0.1557	-0.0190
1999-2002 (4)	2005	0.0163	-0.0357	0.0685
1993-1997 (5)	2000	0.2091	0.2583	0.1598
1994-1998 (5)	2001	0.0713	0.0994	0.0432
1995-1999 (5)	2002	0.0341	0.0551	0.0132
1996-2000 (5)	2003	-0.1274	-0.1634	-0.0911
1997-2001 (5)	2004	-0.0957	-0.1610	-0.0303
1998-2002 (5)	2005	-0.0493	-0.1064	0.0081
1993-1998 (6)	2001	0.0918	0.1219	0.0618
1994-1999 (6)	2002	0.0514	0.0756	0.0271
1995-2000 (6)	2003	-0.0799	-0.1105	-0.0489
1996-2001 (6)	2004	-0.0716	-0.1208	-0.0223
1997-2002 (6)	2005	-0.0673	-0.1276	-0.0068
1993-1999 (7)	2002	0.0775	0.1035	0.0515
1994-2000 (7)	2003	-0.0455	-0.0670	-0.0237
1995-2001 (7)	2004	-0.0491	-0.0947	-0.0034
1996-2002 (7)	2005	-0.0563	-0.1070	-0.0053
1993-2000 (8)	2003	-0.0080	-0.0232	0.0074
1994-2001 (8)	2004	-0.0288	-0.0669	0.0094
1995-2002 (8)	2005	-0.0421	-0.0912	0.0073
1993-2001 (9)	2004	-0.0013	-0.0337	0.0312
1994-2002 (9)	2005	-0.0270	-0.0706	0.0169
1993-2002 (10)	2005	-0.0040	-0.0430	0.0352

**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	0.4126	0.4398	0.3856
1994-1997 (4)	2000	0.4849	0.5027	0.4669
1995-1998 (4)	2001	0.5476	0.5874	0.5086
1996-1999 (4)	2002	0.7140	0.7407	0.6873
1997-2000 (4)	2003	1.1249	1.3098	0.9498
1998-2001 (4)	2004	0.9414	1.0933	0.7958
1999-2002 (4)	2005	0.8054	0.9133	0.7010
1993-1997 (5)	2000	0.4555	0.4729	0.4377
1994-1998 (5)	2001	0.5550	0.5872	0.5231
1995-1999 (5)	2002	0.6875	0.7332	0.6424
1996-2000 (5)	2003	0.9937	1.1037	0.8839
1997-2001 (5)	2004	0.9901	1.1538	0.8353
1998-2002 (5)	2005	0.9382	1.0654	0.8144
1993-1998 (6)	2001	0.5262	0.5552	0.4972
1994-1999 (6)	2002	0.6784	0.7178	0.6392
1995-2000 (6)	2003	0.9280	1.0381	0.8202
1996-2001 (6)	2004	0.9631	1.0869	0.8418
1997-2002 (6)	2005	1.0040	1.1527	0.8617
1993-1999 (7)	2002	0.6402	0.6765	0.6040
1994-2000 (7)	2003	0.8913	0.9836	0.8001
1995-2001 (7)	2004	0.9445	1.0710	0.8220
1996-2002 (7)	2005	1.0052	1.1312	0.8818
1993-2000 (8)	2003	0.8310	0.9106	0.7517
1994-2001 (8)	2004	0.9327	1.0455	0.8226
1995-2002 (8)	2005	1.0040	1.1367	0.8754
1993-2001 (9)	2004	0.8907	0.9916	0.7914
1994-2002 (9)	2005	1.0035	1.1271	0.8831
1993-2002 (10)	2005	0.9712	1.0854	0.8594

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	0.0688	0.0624	0.0749
1994-1997 (4)	2000	0.1457	0.1920	0.0995
1995-1998 (4)	2001	0.0204	0.0340	0.0061
1996-1999 (4)	2002	-0.0751	-0.0483	-0.1020
1997-2000 (4)	2003	-0.4347	-0.5767	-0.3024
1998-2001 (4)	2004	-0.2096	-0.3253	-0.1001
1999-2002 (4)	2005	-0.0249	-0.0975	0.0444
1993-1997 (5)	2000	0.1751	0.2218	0.1287
1994-1998 (5)	2001	0.0130	0.0342	-0.0084
1995-1999 (5)	2002	-0.0486	-0.0408	-0.0571
1996-2000 (5)	2003	-0.3035	-0.3706	-0.2365
1997-2001 (5)	2004	-0.2583	-0.3858	-0.1396
1998-2002 (5)	2005	-0.1577	-0.2496	-0.0690
1993-1998 (6)	2001	0.0418	0.0662	0.0175
1994-1999 (6)	2002	-0.0395	-0.0254	-0.0539
1995-2000 (6)	2003	-0.2378	-0.3050	-0.1728
1996-2001 (6)	2004	-0.2313	-0.3189	-0.1461
1997-2002 (6)	2005	-0.2235	-0.3369	-0.1163
1993-1999 (7)	2002	-0.0013	0.0159	-0.0187
1994-2000 (7)	2003	-0.2011	-0.2505	-0.1527
1995-2001 (7)	2004	-0.2127	-0.3030	-0.1263
1996-2002 (7)	2005	-0.2247	-0.3154	-0.1364
1993-2000 (8)	2003	-0.1408	-0.1775	-0.1043
1994-2001 (8)	2004	-0.2009	-0.2775	-0.1269
1995-2002 (8)	2005	-0.2235	-0.3209	-0.1300
1993-2001 (9)	2004	-0.1589	-0.2236	-0.0957
1994-2002 (9)	2005	-0.2230	-0.3113	-0.1377
1993-2002 (10)	2005	-0.1907	-0.2696	-0.1140