

DELAWARE COMPENSATION RATING BUREAU, INC.

Measures of Goodness of Fit in Trend Calculations Using Severity Ratios – Limited Losses

Estimates of trended severity ratios using from 4 to 10 data points for each loss development technique are shown in Exhibit 3.

The first page of the attachment shows R^2 values for the regressions producing those trended severity ratios.

Pages 2 through 5 show fitted values for the curves used in the trend projections. Page 2 shows indemnity results using linear regression, page 3 is for indemnity-exponential, page 4 for medical-linear, and page 5 for medical-exponential.

Pages 6 through 9 show residuals resulting from the comparison of actual and fitted (actual minus fitted) values for the curves used in the trend projections. Page 6 shows indemnity results using linear regression, page 7 is for indemnity-exponential, page 8 for medical-linear, and page 9 for medical-exponential.

INDEMNITY		(Average)	(Incur)	(Pd-21)
r ²				
4 Point	Linear	0.626	0.542	0.479
5 Point	Linear	0.713	0.582	0.664
6 Point	Linear	0.823	0.743	0.748
7 Point	Linear	0.745	0.687	0.667
8 Point	Linear	0.735	0.675	0.682
9 Point	Linear	0.648	0.593	0.609
10 Point	Linear	0.099	0.139	0.038
4 Point	Expon'l	0.627	0.544	0.484
5 Point	Expon'l	0.712	0.581	0.668
6 Point	Expon'l	0.826	0.749	0.752
7 Point	Expon'l	0.744	0.689	0.667
8 Point	Expon'l	0.735	0.678	0.683
9 Point	Expon'l	0.645	0.592	0.608
10 Point	Expon'l	0.103	0.139	0.042

MEDICAL		(Average)	(Incur)	(Pd-21)
r ²				
4 Point	Linear	0.903	0.857	0.937
5 Point	Linear	0.894	0.858	0.920
6 Point	Linear	0.902	0.888	0.908
7 Point	Linear	0.922	0.913	0.925
8 Point	Linear	0.927	0.926	0.923
9 Point	Linear	0.938	0.934	0.937
10 Point	Linear	0.883	0.879	0.883
4 Point	Expon'l	0.877	0.835	0.910
5 Point	Expon'l	0.877	0.841	0.906
6 Point	Expon'l	0.899	0.884	0.907
7 Point	Expon'l	0.929	0.919	0.934
8 Point	Expon'l	0.942	0.939	0.941
9 Point	Expon'l	0.958	0.953	0.958
10 Point	Expon'l	0.901	0.896	0.903

INDEMNITY Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	0.7545	0.7465	0.7626
	2007	0.7816	0.7827	0.7805
	2008	0.8087	0.8189	0.7985
	2009	0.8358	0.8551	0.8164
5 Point	2005	0.7371	0.7318	0.7426
	2006	0.7610	0.7609	0.7612
	2007	0.7848	0.7899	0.7798
	2008	0.8087	0.8189	0.7985
	2009	0.8325	0.8479	0.8171
6 Point	2004	0.7096	0.6911	0.7284
	2005	0.7345	0.7233	0.7458
	2006	0.7593	0.7555	0.7632
	2007	0.7842	0.7877	0.7806
	2008	0.8090	0.8200	0.7981
	2009	0.8339	0.8522	0.8155
7 Point	2003	0.7079	0.6877	0.7282
	2004	0.7274	0.7132	0.7417
	2005	0.7469	0.7388	0.7551
	2006	0.7664	0.7644	0.7685
	2007	0.7860	0.7900	0.7820
	2008	0.8055	0.8155	0.7954
	2009	0.8250	0.8411	0.8088
8 Point	2002	0.7020	0.6812	0.7228
	2003	0.7188	0.7029	0.7347
	2004	0.7356	0.7247	0.7465
	2005	0.7524	0.7464	0.7583
	2006	0.7692	0.7682	0.7701
	2007	0.7860	0.7900	0.7820
	2008	0.8027	0.8117	0.7938
	2009	0.8195	0.8335	0.8056
	9 Point	2001	0.7044	0.6846
2002		0.7178	0.7019	0.7336
2003		0.7312	0.7192	0.7431
2004		0.7446	0.7365	0.7527
2005		0.7580	0.7538	0.7622
2006		0.7714	0.7712	0.7717
2007		0.7848	0.7885	0.7812
2008		0.7982	0.8058	0.7907
2009		0.8116	0.8231	0.8002
10 Point	2000	0.7428	0.7269	0.7585
	2001	0.7480	0.7348	0.7611
	2002	0.7532	0.7427	0.7637
	2003	0.7585	0.7506	0.7662
	2004	0.7637	0.7585	0.7688
	2005	0.7689	0.7664	0.7714
	2006	0.7741	0.7743	0.7740
	2007	0.7794	0.7822	0.7766
	2008	0.7846	0.7901	0.7792
	2009	0.7898	0.7980	0.7817

INDEMNITY Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	0.7539	0.7460	0.7619
	2007	0.7805	0.7809	0.7798
	2008	0.8081	0.8173	0.7982
	2009	0.8367	0.8555	0.8170
5 Point	2005	0.7374	0.7326	0.7425
	2006	0.7602	0.7598	0.7606
	2007	0.7838	0.7881	0.7792
	2008	0.8081	0.8173	0.7982
	2009	0.8332	0.8477	0.8177
6 Point	2004	0.7105	0.6927	0.7288
	2005	0.7339	0.7222	0.7454
	2006	0.7580	0.7531	0.7625
	2007	0.7829	0.7853	0.7799
	2008	0.8086	0.8188	0.7978
	2009	0.8352	0.8538	0.8160
7 Point	2003	0.7092	0.6900	0.7288
	2004	0.7274	0.7132	0.7416
	2005	0.7460	0.7372	0.7546
	2006	0.7651	0.7619	0.7678
	2007	0.7847	0.7876	0.7813
	2008	0.8048	0.8140	0.7950
	2009	0.8254	0.8414	0.8090
8 Point	2002	0.7037	0.6841	0.7236
	2003	0.7192	0.7036	0.7348
	2004	0.7350	0.7237	0.7462
	2005	0.7512	0.7444	0.7577
	2006	0.7678	0.7657	0.7694
	2007	0.7847	0.7876	0.7813
	2008	0.8020	0.8101	0.7934
	2009	0.8197	0.8332	0.8056
	9 Point	2001	0.7060	0.6875
2002		0.7184	0.7030	0.7339
2003		0.7310	0.7189	0.7430
2004		0.7438	0.7351	0.7522
2005		0.7568	0.7517	0.7615
2006		0.7701	0.7687	0.7710
2007		0.7836	0.7860	0.7805
2008		0.7973	0.8038	0.7902
2009		0.8112	0.8219	0.8000
10 Point	2000	0.7415	0.7260	0.7572
	2001	0.7466	0.7335	0.7598
	2002	0.7518	0.7410	0.7625
	2003	0.7570	0.7486	0.7652
	2004	0.7622	0.7562	0.7678
	2005	0.7675	0.7640	0.7705
	2006	0.7728	0.7718	0.7732
	2007	0.7781	0.7797	0.7759
	2008	0.7835	0.7877	0.7787
	2009	0.7889	0.7957	0.7814

MEDICAL Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	1.2044	1.2630	1.1457
	2007	1.3567	1.4116	1.3018
	2008	1.5090	1.5601	1.4580
	2009	1.6613	1.7087	1.6141
5 Point	2005	1.1291	1.1916	1.0664
	2006	1.2557	1.3144	1.1969
	2007	1.3824	1.4373	1.3274
	2008	1.5090	1.5601	1.4580
	2009	1.6356	1.6830	1.5885
6 Point	2004	1.0553	1.1083	1.0022
	2005	1.1675	1.2204	1.1146
	2006	1.2797	1.3324	1.2270
	2007	1.3920	1.4445	1.3395
	2008	1.5042	1.5565	1.4519
	2009	1.6164	1.6686	1.5644
7 Point	2003	0.9736	1.0245	0.9226
	2004	1.0788	1.1300	1.0275
	2005	1.1840	1.2356	1.1323
	2006	1.2891	1.3411	1.2372
	2007	1.3943	1.4466	1.3420
	2008	1.4995	1.5522	1.4469
	2009	1.6047	1.6577	1.5517
8 Point	2002	0.9075	0.9512	0.8638
	2003	1.0049	1.0503	0.9594
	2004	1.1022	1.1494	1.0551
	2005	1.1996	1.2485	1.1507
	2006	1.2970	1.3475	1.2464
	2007	1.3943	1.4466	1.3420
	2008	1.4917	1.5457	1.4377
	2009	1.5890	1.6448	1.5333
9 Point	2001	0.8363	0.8830	0.7895
	2002	0.9291	0.9767	0.8814
	2003	1.0218	1.0703	0.9732
	2004	1.1145	1.1639	1.0651
	2005	1.2073	1.2576	1.1570
	2006	1.3000	1.3512	1.2489
	2007	1.3928	1.4448	1.3408
	2008	1.4855	1.5385	1.4326
	2009	1.5782	1.6321	1.5245
10 Point	2000	0.8243	0.8713	0.7772
	2001	0.9043	0.9520	0.8565
	2002	0.9843	1.0327	0.9358
	2003	1.0643	1.1134	1.0151
	2004	1.1443	1.1941	1.0944
	2005	1.2243	1.2748	1.1738
	2006	1.3043	1.3555	1.2531
	2007	1.3843	1.4362	1.3324
	2008	1.4643	1.5169	1.4117
	2009	1.5443	1.5976	1.4910

MEDICAL Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	1.2031	1.2598	1.1466
	2007	1.3442	1.3989	1.2894
	2008	1.5018	1.5535	1.4500
	2009	1.6779	1.7250	1.6306
5 Point	2005	1.1379	1.1984	1.0774
	2006	1.2482	1.3067	1.1895
	2007	1.3691	1.4247	1.3133
	2008	1.5018	1.5535	1.4500
	2009	1.6473	1.6938	1.6009
6 Point	2004	1.0714	1.1225	1.0202
	2005	1.1649	1.2169	1.1128
	2006	1.2666	1.3193	1.2138
	2007	1.3772	1.4302	1.3240
	2008	1.4974	1.5505	1.4441
	2009	1.6281	1.6809	1.5752
7 Point	2003	0.9962	1.0454	0.9470
	2004	1.0804	1.1308	1.0300
	2005	1.1718	1.2232	1.1203
	2006	1.2709	1.3232	1.2184
	2007	1.3783	1.4313	1.3252
	2008	1.4949	1.5482	1.4414
	2009	1.6213	1.6747	1.5677
8 Point	2002	0.9365	0.9788	0.8942
	2003	1.0118	1.0561	0.9674
	2004	1.0931	1.1395	1.0466
	2005	1.1809	1.2294	1.1322
	2006	1.2758	1.3265	1.2249
	2007	1.3783	1.4313	1.3252
	2008	1.4891	1.5443	1.4337
	2009	1.6087	1.6662	1.5511
9 Point	2001	0.8716	0.9172	0.8258
	2002	0.9407	0.9877	0.8936
	2003	1.0153	1.0636	0.9669
	2004	1.0959	1.1454	1.0462
	2005	1.1828	1.2334	1.1320
	2006	1.2766	1.3282	1.2248
	2007	1.3779	1.4303	1.3253
	2008	1.4872	1.5403	1.4340
	2009	1.6051	1.6587	1.5516
10 Point	2000	0.8625	0.9085	0.8165
	2001	0.9213	0.9684	0.8741
	2002	0.9841	1.0323	0.9358
	2003	1.0512	1.1004	1.0018
	2004	1.1228	1.1729	1.0725
	2005	1.1993	1.2503	1.1482
	2006	1.2811	1.3327	1.2292
	2007	1.3683	1.4206	1.3159
	2008	1.4616	1.5143	1.4087
	2009	1.5612	1.6142	1.5081

INDEMNITY Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0211	-0.0203	-0.0220
	2007	0.0390	0.0534	0.0247
	2008	-0.0146	-0.0460	0.0167
	2009	-0.0033	0.0129	-0.0194
5 Point	2005	0.0065	0.0144	-0.0014
	2006	-0.0276	-0.0347	-0.0206
	2007	0.0358	0.0462	0.0254
	2008	-0.0146	-0.0460	0.0167
	2009	0.0000	0.0201	-0.0201
6 Point	2004	-0.0033	-0.0107	0.0040
	2005	0.0091	0.0229	-0.0046
	2006	-0.0259	-0.0293	-0.0226
	2007	0.0364	0.0484	0.0246
	2008	-0.0149	-0.0471	0.0171
	2009	-0.0014	0.0158	-0.0185
7 Point	2003	0.0267	0.0332	0.0199
	2004	-0.0211	-0.0328	-0.0093
	2005	-0.0033	0.0074	-0.0139
	2006	-0.0330	-0.0382	-0.0279
	2007	0.0346	0.0461	0.0232
	2008	-0.0114	-0.0426	0.0198
	2009	0.0075	0.0269	-0.0118
8 Point	2002	0.0191	0.0267	0.0113
	2003	0.0158	0.0180	0.0134
	2004	-0.0293	-0.0443	-0.0141
	2005	-0.0088	-0.0002	-0.0171
	2006	-0.0358	-0.0420	-0.0295
	2007	0.0346	0.0461	0.0232
	2008	-0.0086	-0.0388	0.0214
	2009	0.0130	0.0345	-0.0086
	9 Point	2001	0.0315	0.0414
2002		0.0033	0.0060	0.0005
2003		0.0034	0.0017	0.0050
2004		-0.0383	-0.0561	-0.0203
2005		-0.0144	-0.0076	-0.0210
2006		-0.0380	-0.0450	-0.0311
2007		0.0358	0.0476	0.0240
2008		-0.0041	-0.0329	0.0245
2009		0.0209	0.0449	-0.0032
10 Point	2000	0.0981	0.1130	0.0832
	2001	-0.0121	-0.0088	-0.0154
	2002	-0.0321	-0.0348	-0.0296
	2003	-0.0239	-0.0297	-0.0181
	2004	-0.0574	-0.0781	-0.0364
	2005	-0.0253	-0.0202	-0.0302
	2006	-0.0407	-0.0481	-0.0334
	2007	0.0412	0.0539	0.0286
	2008	0.0095	-0.0172	0.0360
	2009	0.0427	0.0700	0.0153

INDEMNITY Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0205	-0.0198	-0.0213
	2007	0.0401	0.0552	0.0254
	2008	-0.0140	-0.0444	0.0170
	2009	-0.0042	0.0125	-0.0200
5 Point	2005	0.0062	0.0136	-0.0013
	2006	-0.0268	-0.0336	-0.0200
	2007	0.0368	0.0480	0.0260
	2008	-0.0140	-0.0444	0.0170
	2009	-0.0007	0.0203	-0.0207
6 Point	2004	-0.0042	-0.0123	0.0036
	2005	0.0097	0.0240	-0.0042
	2006	-0.0246	-0.0269	-0.0219
	2007	0.0377	0.0508	0.0253
	2008	-0.0145	-0.0459	0.0174
	2009	-0.0027	0.0142	-0.0190
7 Point	2003	0.0254	0.0309	0.0193
	2004	-0.0211	-0.0328	-0.0092
	2005	-0.0024	0.0090	-0.0134
	2006	-0.0317	-0.0357	-0.0272
	2007	0.0359	0.0485	0.0239
	2008	-0.0107	-0.0411	0.0202
	2009	0.0071	0.0266	-0.0120
8 Point	2002	0.0174	0.0238	0.0105
	2003	0.0154	0.0173	0.0133
	2004	-0.0287	-0.0433	-0.0138
	2005	-0.0076	0.0018	-0.0165
	2006	-0.0344	-0.0395	-0.0288
	2007	0.0359	0.0485	0.0239
	2008	-0.0079	-0.0372	0.0218
	2009	0.0128	0.0348	-0.0086
	9 Point	2001	0.0299	0.0385
2002		0.0027	0.0049	0.0002
2003		0.0036	0.0020	0.0051
2004		-0.0375	-0.0547	-0.0198
2005		-0.0132	-0.0055	-0.0203
2006		-0.0367	-0.0425	-0.0304
2007		0.0370	0.0501	0.0247
2008		-0.0032	-0.0309	0.0250
2009		0.0213	0.0461	-0.0030
10 Point	2000	0.0994	0.1139	0.0845
	2001	-0.0107	-0.0075	-0.0141
	2002	-0.0307	-0.0331	-0.0284
	2003	-0.0224	-0.0277	-0.0171
	2004	-0.0559	-0.0758	-0.0354
	2005	-0.0239	-0.0178	-0.0293
	2006	-0.0394	-0.0456	-0.0326
	2007	0.0425	0.0564	0.0293
	2008	0.0106	-0.0148	0.0365
	2009	0.0436	0.0723	0.0156

MEDICAL Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0604	-0.0711	-0.0497
	2007	0.0733	0.0792	0.0675
	2008	0.0344	0.0550	0.0140
	2009	-0.0474	-0.0631	-0.0318
5 Point	2005	0.0514	0.0514	0.0513
	2006	-0.1117	-0.1225	-0.1009
	2007	0.0476	0.0535	0.0419
	2008	0.0344	0.0550	0.0140
	2009	-0.0217	-0.0374	-0.0062
6 Point	2004	0.0480	0.0360	0.0602
	2005	0.0130	0.0226	0.0031
	2006	-0.1357	-0.1405	-0.1310
	2007	0.0380	0.0463	0.0298
	2008	0.0392	0.0586	0.0200
	2009	-0.0025	-0.0230	0.0179
7 Point	2003	0.0352	0.0325	0.0380
	2004	0.0245	0.0143	0.0349
	2005	-0.0034	0.0074	-0.0146
	2006	-0.1451	-0.1492	-0.1412
	2007	0.0357	0.0442	0.0273
	2008	0.0439	0.0629	0.0250
	2009	0.0092	-0.0121	0.0306
8 Point	2002	0.0548	0.0451	0.0644
	2003	0.0039	0.0067	0.0012
	2004	0.0011	-0.0051	0.0073
	2005	-0.0191	-0.0055	-0.0330
	2006	-0.1530	-0.1556	-0.1504
	2007	0.0357	0.0442	0.0273
	2008	0.0517	0.0694	0.0342
	2009	0.0249	0.0008	0.0490
	9 Point	2001	0.0431	0.0510
2002		0.0332	0.0196	0.0467
2003		-0.0130	-0.0133	-0.0126
2004		-0.0112	-0.0196	-0.0027
2005		-0.0268	-0.0146	-0.0393
2006		-0.1560	-0.1593	-0.1529
2007		0.0372	0.0460	0.0285
2008		0.0579	0.0766	0.0393
2009		0.0357	0.0135	0.0578
10 Point	2000	0.1530	0.1553	0.1508
	2001	-0.0249	-0.0180	-0.0318
	2002	-0.0220	-0.0364	-0.0077
	2003	-0.0555	-0.0564	-0.0545
	2004	-0.0410	-0.0498	-0.0320
	2005	-0.0438	-0.0318	-0.0561
	2006	-0.1603	-0.1636	-0.1571
	2007	0.0457	0.0546	0.0369
	2008	0.0791	0.0982	0.0602
	2009	0.0696	0.0480	0.0913

MEDICAL Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0591	-0.0679	-0.0506
	2007	0.0858	0.0919	0.0799
	2008	0.0416	0.0616	0.0219
	2009	-0.0640	-0.0794	-0.0483
5 Point	2005	0.0426	0.0446	0.0403
	2006	-0.1042	-0.1148	-0.0935
	2007	0.0609	0.0661	0.0560
	2008	0.0416	0.0616	0.0219
	2009	-0.0334	-0.0482	-0.0186
6 Point	2004	0.0319	0.0218	0.0422
	2005	0.0156	0.0261	0.0049
	2006	-0.1226	-0.1274	-0.1178
	2007	0.0528	0.0606	0.0453
	2008	0.0460	0.0646	0.0278
	2009	-0.0142	-0.0353	0.0071
7 Point	2003	0.0126	0.0116	0.0136
	2004	0.0229	0.0135	0.0324
	2005	0.0087	0.0198	-0.0026
	2006	-0.1269	-0.1313	-0.1224
	2007	0.0517	0.0595	0.0441
	2008	0.0485	0.0669	0.0305
	2009	-0.0074	-0.0291	0.0146
8 Point	2002	0.0258	0.0175	0.0339
	2003	-0.0030	0.0009	-0.0068
	2004	0.0102	0.0048	0.0158
	2005	-0.0004	0.0136	-0.0145
	2006	-0.1318	-0.1346	-0.1289
	2007	0.0517	0.0595	0.0441
	2008	0.0543	0.0708	0.0382
	2009	0.0052	-0.0206	0.0312
9 Point	2001	0.0078	0.0168	-0.0011
	2002	0.0216	0.0086	0.0345
	2003	-0.0065	-0.0066	-0.0063
	2004	0.0074	-0.0011	0.0162
	2005	-0.0023	0.0096	-0.0143
	2006	-0.1326	-0.1363	-0.1288
	2007	0.0521	0.0605	0.0440
	2008	0.0562	0.0748	0.0379
	2009	0.0088	-0.0131	0.0307
10 Point	2000	0.1148	0.1181	0.1115
	2001	-0.0419	-0.0344	-0.0494
	2002	-0.0218	-0.0360	-0.0077
	2003	-0.0424	-0.0434	-0.0412
	2004	-0.0195	-0.0286	-0.0101
	2005	-0.0188	-0.0073	-0.0305
	2006	-0.1371	-0.1408	-0.1332
	2007	0.0617	0.0702	0.0534
	2008	0.0818	0.1008	0.0632
	2009	0.0527	0.0314	0.0742