

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-22)
r ²				
4 Point	Linear	0.906	0.882	0.806
5 Point	Linear	0.940	0.914	0.886
6 Point	Linear	0.813	0.793	0.769
7 Point	Linear	0.864	0.857	0.820
8 Point	Linear	0.860	0.848	0.830
9 Point	Linear	0.650	0.599	0.667
10 Point	Linear	0.682	0.631	0.700
4 Point	Expon'l	0.915	0.881	0.816
5 Point	Expon'l	0.951	0.920	0.899
6 Point	Expon'l	0.821	0.797	0.778
7 Point	Expon'l	0.876	0.865	0.834
8 Point	Expon'l	0.875	0.859	0.847
9 Point	Expon'l	0.652	0.596	0.674
10 Point	Expon'l	0.689	0.633	0.711
MEDICAL		(Average)	(Incur)	(Pd-22)
r ²				
4 Point	Linear	0.822	0.779	0.879
5 Point	Linear	0.879	0.837	0.927
6 Point	Linear	0.810	0.755	0.873
7 Point	Linear	0.798	0.744	0.858
8 Point	Linear	0.819	0.774	0.869
9 Point	Linear	0.793	0.757	0.831
10 Point	Linear	0.818	0.784	0.853
4 Point	Expon'l	0.862	0.817	0.914
5 Point	Expon'l	0.927	0.896	0.957
6 Point	Expon'l	0.858	0.809	0.908
7 Point	Expon'l	0.859	0.813	0.905
8 Point	Expon'l	0.893	0.860	0.925
9 Point	Expon'l	0.871	0.849	0.890
10 Point	Expon'l	0.903	0.885	0.918

INDEMNITY Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.6493	0.6352	0.6634
	2008	0.6823	0.6690	0.6956
	2009	0.7153	0.7029	0.7277
	2010	0.7483	0.7367	0.7599
5 Point	2006	0.6226	0.6111	0.6340
	2007	0.6535	0.6417	0.6653
	2008	0.6844	0.6723	0.6965
	2009	0.7153	0.7029	0.7277
	2010	0.7462	0.7335	0.7590
6 Point	2005	0.6211	0.6096	0.6327
	2006	0.6440	0.6323	0.6558
	2007	0.6669	0.6549	0.6788
	2008	0.6898	0.6776	0.7019
	2009	0.7126	0.7002	0.7250
	2010	0.7355	0.7229	0.7481
7 Point	2004	0.6018	0.5880	0.6156
	2005	0.6239	0.6104	0.6373
	2006	0.6459	0.6328	0.6590
	2007	0.6680	0.6552	0.6807
	2008	0.6900	0.6777	0.7024
	2009	0.7121	0.7001	0.7241
	2010	0.7341	0.7225	0.7458
8 Point	2003	0.5918	0.5789	0.6047
	2004	0.6115	0.5986	0.6242
	2005	0.6311	0.6184	0.6438
	2006	0.6508	0.6381	0.6633
	2007	0.6704	0.6579	0.6829
	2008	0.6900	0.6777	0.7024
	2009	0.7097	0.6974	0.7219
	2010	0.7293	0.7172	0.7415
9 Point	2002	0.6024	0.5924	0.6124
	2003	0.6167	0.6062	0.6271
	2004	0.6310	0.6201	0.6419
	2005	0.6453	0.6340	0.6566
	2006	0.6596	0.6479	0.6713
	2007	0.6740	0.6618	0.6861
	2008	0.6883	0.6757	0.7008
	2009	0.7026	0.6896	0.7155
	2010	0.7169	0.7035	0.7303
10 Point	2001	0.5944	0.5849	0.6038
	2002	0.6077	0.5978	0.6175
	2003	0.6210	0.6107	0.6313
	2004	0.6343	0.6235	0.6451
	2005	0.6477	0.6364	0.6588
	2006	0.6610	0.6493	0.6726
	2007	0.6743	0.6622	0.6864
	2008	0.6876	0.6750	0.7001
	2009	0.7009	0.6879	0.7139
	2010	0.7142	0.7008	0.7277

INDEMNITY Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.6506	0.6363	0.6647
	2008	0.6817	0.6682	0.6949
	2009	0.7142	0.7017	0.7265
	2010	0.7483	0.7369	0.7596
5 Point	2006	0.6245	0.6130	0.6358
	2007	0.6531	0.6412	0.6647
	2008	0.6830	0.6708	0.6950
	2009	0.7142	0.7017	0.7265
	2010	0.7469	0.7341	0.7596
6 Point	2005	0.6232	0.6117	0.6347
	2006	0.6441	0.6324	0.6559
	2007	0.6659	0.6539	0.6778
	2008	0.6883	0.6761	0.7004
	2009	0.7115	0.6990	0.7237
	2010	0.7354	0.7227	0.7479
7 Point	2004	0.6043	0.5905	0.6181
	2005	0.6243	0.6108	0.6378
	2006	0.6450	0.6318	0.6581
	2007	0.6663	0.6535	0.6791
	2008	0.6884	0.6760	0.7007
	2009	0.7112	0.6992	0.7230
	2010	0.7348	0.7232	0.7461
8 Point	2003	0.5947	0.5818	0.6076
	2004	0.6124	0.5995	0.6252
	2005	0.6306	0.6178	0.6432
	2006	0.6493	0.6366	0.6619
	2007	0.6686	0.6560	0.6810
	2008	0.6884	0.6760	0.7007
	2009	0.7089	0.6966	0.7210
	2010	0.7299	0.7178	0.7418
9 Point	2002	0.6047	0.5945	0.6149
	2003	0.6176	0.6070	0.6282
	2004	0.6308	0.6198	0.6417
	2005	0.6443	0.6329	0.6556
	2006	0.6581	0.6463	0.6698
	2007	0.6722	0.6600	0.6843
	2008	0.6866	0.6739	0.6990
	2009	0.7012	0.6882	0.7141
	2010	0.7162	0.7027	0.7296
10 Point	2001	0.5969	0.5873	0.6065
	2002	0.6089	0.5989	0.6189
	2003	0.6211	0.6107	0.6315
	2004	0.6336	0.6227	0.6443
	2005	0.6463	0.6350	0.6575
	2006	0.6593	0.6475	0.6709
	2007	0.6725	0.6603	0.6845
	2008	0.6860	0.6733	0.6985
	2009	0.6997	0.6866	0.7127
	2010	0.7138	0.7001	0.7272

MEDICAL Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	1.3454	1.3870	1.3038
	2008	1.6475	1.7424	1.5526
	2009	1.9496	2.0978	1.8014
	2010	2.2518	2.4532	2.0502
5 Point	2006	1.1206	1.1503	1.0911
	2007	1.3970	1.4661	1.3278
	2008	1.6733	1.7819	1.5646
	2009	1.9496	2.0978	1.8014
	2010	2.2260	2.4136	2.0382
6 Point	2005	1.0670	1.1119	1.0221
	2006	1.2826	1.3520	1.2131
	2007	1.4982	1.5922	1.4041
	2008	1.7138	1.8324	1.5951
	2009	1.9294	2.0725	1.7861
	2010	2.1450	2.3127	1.9771
7 Point	2004	0.9901	1.0351	0.9450
	2005	1.1737	1.2376	1.1098
	2006	1.3573	1.4400	1.2745
	2007	1.5409	1.6425	1.4392
	2008	1.7245	1.8449	1.6039
	2009	1.9081	2.0474	1.7686
	2010	2.0917	2.2498	1.9333
8 Point	2003	0.8866	0.9199	0.8535
	2004	1.0542	1.1049	1.0036
	2005	1.2218	1.2899	1.1537
	2006	1.3893	1.4749	1.3037
	2007	1.5569	1.6599	1.4538
	2008	1.7245	1.8449	1.6039
	2009	1.8920	2.0300	1.7540
	2010	2.0596	2.2150	1.9041
	9 Point	2002	0.8453	0.8697
2003		0.9906	1.0309	0.9504
2004		1.1359	1.1921	1.0797
2005		1.2812	1.3533	1.2090
2006		1.4265	1.5146	1.3383
2007		1.5717	1.6758	1.4677
2008		1.7170	1.8370	1.5970
2009		1.8623	1.9982	1.7263
2010		2.0076	2.1594	1.8556
10 Point		2001	0.7524	0.7711
	2002	0.8894	0.9224	0.8565
	2003	1.0264	1.0738	0.9791
	2004	1.1635	1.2251	1.1018
	2005	1.3005	1.3764	1.2245
	2006	1.4375	1.5278	1.3472
	2007	1.5745	1.6791	1.4699
	2008	1.7115	1.8304	1.5926
	2009	1.8485	1.9817	1.7152
	2010	1.9856	2.1331	1.8379

MEDICAL Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	1.3881	1.4445	1.3323
	2008	1.6285	1.7180	1.5381
	2009	1.9106	2.0434	1.7758
	2010	2.2415	2.4303	2.0501
5 Point	2006	1.1766	1.2235	1.1305
	2007	1.3829	1.4516	1.3142
	2008	1.6255	1.7223	1.5276
	2009	1.9106	2.0434	1.7758
	2010	2.2457	2.4244	2.0642
6 Point	2005	1.1336	1.1939	1.0737
	2006	1.2880	1.3610	1.2149
	2007	1.4634	1.5516	1.3746
	2008	1.6627	1.7687	1.5553
	2009	1.8891	2.0163	1.7599
	2010	2.1463	2.2986	1.9913
7 Point	2004	1.0658	1.1258	1.0061
	2005	1.1926	1.2622	1.1232
	2006	1.3346	1.4150	1.2538
	2007	1.4934	1.5864	1.3996
	2008	1.6711	1.7786	1.5624
	2009	1.8700	1.9940	1.7441
	2010	2.0926	2.2356	1.9469
8 Point	2003	0.9715	1.0197	0.9237
	2004	1.0829	1.1397	1.0261
	2005	1.2069	1.2739	1.1398
	2006	1.3452	1.4238	1.2661
	2007	1.4993	1.5913	1.4065
	2008	1.6711	1.7786	1.5624
	2009	1.8626	1.9879	1.7355
	2010	2.0760	2.2219	1.9279
	9 Point	2002	0.9363	0.9764
2003		1.0305	1.0783	0.9828
2004		1.1341	1.1909	1.0773
2005		1.2482	1.3152	1.1809
2006		1.3738	1.4525	1.2945
2007		1.5120	1.6041	1.4190
2008		1.6641	1.7715	1.5555
2009		1.8315	1.9564	1.7051
2010		2.0158	2.1607	1.8691
10 Point		2001	0.8510	0.8861
	2002	0.9366	0.9782	0.8951
	2003	1.0307	1.0799	0.9815
	2004	1.1344	1.1923	1.0762
	2005	1.2484	1.3163	1.1801
	2006	1.3739	1.4531	1.2940
	2007	1.5120	1.6043	1.4188
	2008	1.6641	1.7711	1.5558
	2009	1.8314	1.9553	1.7059
	2010	2.0155	2.1587	1.8706

INDEMNITY Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.0110	0.0147	0.0071
	2008	-0.0093	-0.0224	0.0039
	2009	-0.0142	0.0006	-0.0291
	2010	0.0126	0.0071	0.0181
5 Point	2006	0.0042	0.0066	0.0019
	2007	0.0068	0.0082	0.0052
	2008	-0.0114	-0.0257	0.0030
	2009	-0.0142	0.0006	-0.0291
	2010	0.0147	0.0103	0.0190
6 Point	2005	0.0267	0.0264	0.0271
	2006	-0.0172	-0.0146	-0.0199
	2007	-0.0066	-0.0050	-0.0083
	2008	-0.0168	-0.0310	-0.0024
	2009	-0.0115	0.0033	-0.0264
	2010	0.0254	0.0209	0.0299
7 Point	2004	0.0042	0.0012	0.0070
	2005	0.0239	0.0256	0.0225
	2006	-0.0191	-0.0151	-0.0231
	2007	-0.0077	-0.0053	-0.0102
	2008	-0.0170	-0.0311	-0.0029
	2009	-0.0110	0.0034	-0.0255
	2010	0.0268	0.0213	0.0322
8 Point	2003	0.0169	0.0186	0.0151
	2004	-0.0055	-0.0094	-0.0016
	2005	0.0167	0.0176	0.0160
	2006	-0.0240	-0.0204	-0.0274
	2007	-0.0101	-0.0080	-0.0124
	2008	-0.0170	-0.0311	-0.0029
	2009	-0.0086	0.0061	-0.0233
	2010	0.0316	0.0266	0.0365
9 Point	2002	0.0498	0.0547	0.0448
	2003	-0.0080	-0.0087	-0.0073
	2004	-0.0250	-0.0309	-0.0193
	2005	0.0025	0.0020	0.0032
	2006	-0.0328	-0.0302	-0.0354
	2007	-0.0137	-0.0119	-0.0156
	2008	-0.0153	-0.0291	-0.0013
	2009	-0.0015	0.0139	-0.0169
	2010	0.0440	0.0403	0.0477
10 Point	2001	0.0119	0.0123	0.0116
	2002	0.0445	0.0493	0.0397
	2003	-0.0123	-0.0132	-0.0115
	2004	-0.0283	-0.0343	-0.0225
	2005	0.0001	-0.0004	0.0010
	2006	-0.0342	-0.0316	-0.0367
	2007	-0.0140	-0.0123	-0.0159
	2008	-0.0146	-0.0284	-0.0006
	2009	0.0002	0.0156	-0.0153
	2010	0.0467	0.0430	0.0503

INDEMNITY Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.0097	0.0136	0.0058
	2008	-0.0087	-0.0216	0.0046
	2009	-0.0131	0.0018	-0.0279
	2010	0.0126	0.0069	0.0184
5 Point	2006	0.0023	0.0047	0.0001
	2007	0.0072	0.0087	0.0058
	2008	-0.0100	-0.0242	0.0045
	2009	-0.0131	0.0018	-0.0279
	2010	0.0140	0.0097	0.0184
6 Point	2005	0.0246	0.0243	0.0251
	2006	-0.0173	-0.0147	-0.0200
	2007	-0.0056	-0.0040	-0.0073
	2008	-0.0153	-0.0295	-0.0009
	2009	-0.0104	0.0045	-0.0251
	2010	0.0255	0.0211	0.0301
7 Point	2004	0.0017	-0.0013	0.0045
	2005	0.0235	0.0252	0.0220
	2006	-0.0182	-0.0141	-0.0222
	2007	-0.0060	-0.0036	-0.0086
	2008	-0.0154	-0.0294	-0.0012
	2009	-0.0101	0.0043	-0.0244
	2010	0.0261	0.0206	0.0319
8 Point	2003	0.0140	0.0157	0.0122
	2004	-0.0064	-0.0103	-0.0026
	2005	0.0172	0.0182	0.0166
	2006	-0.0225	-0.0189	-0.0260
	2007	-0.0083	-0.0061	-0.0105
	2008	-0.0154	-0.0294	-0.0012
	2009	-0.0078	0.0069	-0.0224
	2010	0.0310	0.0260	0.0362
	9 Point	2002	0.0475	0.0526
2003		-0.0089	-0.0095	-0.0084
2004		-0.0248	-0.0306	-0.0191
2005		0.0035	0.0031	0.0042
2006		-0.0313	-0.0286	-0.0339
2007		-0.0119	-0.0101	-0.0138
2008		-0.0136	-0.0273	0.0005
2009		-0.0001	0.0153	-0.0155
2010		0.0447	0.0411	0.0484
10 Point		2001	0.0094	0.0099
	2002	0.0433	0.0482	0.0383
	2003	-0.0124	-0.0132	-0.0117
	2004	-0.0276	-0.0335	-0.0217
	2005	0.0015	0.0010	0.0023
	2006	-0.0325	-0.0298	-0.0350
	2007	-0.0122	-0.0104	-0.0140
	2008	-0.0130	-0.0267	0.0010
	2009	0.0014	0.0169	-0.0141
	2010	0.0471	0.0437	0.0508

MEDICAL Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.1264	0.1788	0.0741
	2008	-0.0817	-0.1284	-0.0351
	2009	-0.2158	-0.2796	-0.1521
	2010	0.1711	0.2292	0.1131
5 Point	2006	0.0516	0.0792	0.0240
	2007	0.0748	0.0996	0.0501
	2008	-0.1075	-0.1679	-0.0471
	2009	-0.2158	-0.2796	-0.1521
	2010	0.1969	0.2687	0.1251
6 Point	2005	0.2024	0.2521	0.1526
	2006	-0.1104	-0.1225	-0.0980
	2007	-0.0264	-0.0265	-0.0262
	2008	-0.1480	-0.2184	-0.0776
	2009	-0.1956	-0.2543	-0.1368
	2010	0.2779	0.3696	0.1862
7 Point	2004	0.1600	0.1886	0.1315
	2005	0.0957	0.1264	0.0649
	2006	-0.1851	-0.2105	-0.1594
	2007	-0.0691	-0.0768	-0.0613
	2008	-0.1587	-0.2309	-0.0864
	2009	-0.1743	-0.2292	-0.1193
	2010	0.3312	0.4325	0.2300
8 Point	2003	0.1123	0.1221	0.1024
	2004	0.0959	0.1188	0.0729
	2005	0.0476	0.0741	0.0211
	2006	-0.2171	-0.2454	-0.1886
	2007	-0.0851	-0.0942	-0.0759
	2008	-0.1587	-0.2309	-0.0864
	2009	-0.1582	-0.2118	-0.1047
	2010	0.3633	0.4673	0.2592
9 Point	2002	0.2080	0.2221	0.1938
	2003	0.0083	0.0110	0.0055
	2004	0.0142	0.0316	-0.0032
	2005	-0.0118	0.0107	-0.0343
	2006	-0.2543	-0.2851	-0.2232
	2007	-0.0999	-0.1101	-0.0898
	2008	-0.1512	-0.2230	-0.0795
	2009	-0.1285	-0.1800	-0.0770
	2010	0.4153	0.5229	0.3077
10 Point	2001	0.0992	0.1187	0.0796
	2002	0.1639	0.1694	0.1584
	2003	-0.0275	-0.0319	-0.0232
	2004	-0.0134	-0.0014	-0.0253
	2005	-0.0311	-0.0124	-0.0498
	2006	-0.2653	-0.2983	-0.2321
	2007	-0.1027	-0.1134	-0.0920
	2008	-0.1457	-0.2164	-0.0751
	2009	-0.1147	-0.1635	-0.0659
	2010	0.4373	0.5492	0.3254

MEDICAL Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-22)
4 Point	2007	0.0837	0.1212	0.0456
	2008	-0.0627	-0.1040	-0.0206
	2009	-0.1768	-0.2252	-0.1265
	2010	0.1814	0.2520	0.1132
5 Point	2006	-0.0044	0.0060	-0.0154
	2007	0.0889	0.1141	0.0637
	2008	-0.0597	-0.1083	-0.0101
	2009	-0.1768	-0.2252	-0.1265
	2010	0.1772	0.2579	0.0991
6 Point	2005	0.1358	0.1701	0.1010
	2006	-0.1158	-0.1315	-0.0998
	2007	0.0084	0.0141	0.0033
	2008	-0.0969	-0.1547	-0.0378
	2009	-0.1553	-0.1981	-0.1106
	2010	0.2766	0.3837	0.1720
7 Point	2004	0.0843	0.0979	0.0704
	2005	0.0768	0.1018	0.0515
	2006	-0.1624	-0.1855	-0.1387
	2007	-0.0216	-0.0207	-0.0217
	2008	-0.1053	-0.1646	-0.0449
	2009	-0.1362	-0.1758	-0.0948
	2010	0.3303	0.4467	0.2164
8 Point	2003	0.0274	0.0222	0.0322
	2004	0.0672	0.0840	0.0504
	2005	0.0625	0.0901	0.0349
	2006	-0.1730	-0.1943	-0.1510
	2007	-0.0275	-0.0256	-0.0286
	2008	-0.1053	-0.1646	-0.0449
	2009	-0.1288	-0.1697	-0.0862
	2010	0.3469	0.4604	0.2354
	9 Point	2002	0.1170	0.1154
2003		-0.0316	-0.0364	-0.0269
2004		0.0160	0.0328	-0.0008
2005		0.0212	0.0488	-0.0062
2006		-0.2016	-0.2230	-0.1794
2007		-0.0402	-0.0384	-0.0411
2008		-0.0983	-0.1575	-0.0380
2009		-0.0977	-0.1382	-0.0558
2010		0.4071	0.5216	0.2942
10 Point		2001	0.0006	0.0037
	2002	0.1167	0.1136	0.1198
	2003	-0.0318	-0.0380	-0.0256
	2004	0.0157	0.0314	0.0003
	2005	0.0210	0.0477	-0.0054
	2006	-0.2017	-0.2236	-0.1789
	2007	-0.0402	-0.0386	-0.0409
	2008	-0.0983	-0.1571	-0.0383
	2009	-0.0976	-0.1371	-0.0566
	2010	0.4074	0.5236	0.2927