

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 2.

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-20)
r^2				
4 Point	Linear	0.395	0.358	0.433
5 Point	Linear	0.690	0.661	0.715
6 Point	Linear	0.812	0.782	0.836
7 Point	Linear	0.825	0.795	0.851
8 Point	Linear	0.880	0.853	0.900
9 Point	Linear	0.877	0.853	0.895
10 Point	Linear	0.885	0.860	0.904
4 Point	Expon'l	0.415	0.387	0.442
5 Point	Expon'l	0.705	0.686	0.721
6 Point	Expon'l	0.827	0.807	0.841
7 Point	Expon'l	0.840	0.817	0.857
8 Point	Expon'l	0.893	0.877	0.900
9 Point	Expon'l	0.894	0.881	0.899
10 Point	Expon'l	0.908	0.894	0.915
MEDICAL		(Average)	(Incur)	(Pd-20)
r^2				
4 Point	Linear	0.747	0.726	0.780
5 Point	Linear	0.873	0.861	0.889
6 Point	Linear	0.925	0.921	0.922
7 Point	Linear	0.948	0.941	0.950
8 Point	Linear	0.965	0.960	0.967
9 Point	Linear	0.966	0.964	0.965
10 Point	Linear	0.963	0.960	0.963
4 Point	Expon'l	0.739	0.718	0.771
5 Point	Expon'l	0.869	0.859	0.882
6 Point	Expon'l	0.914	0.917	0.901
7 Point	Expon'l	0.945	0.945	0.938
8 Point	Expon'l	0.956	0.954	0.954
9 Point	Expon'l	0.967	0.966	0.963
10 Point	Expon'l	0.973	0.972	0.970

INDEMNITY Linear <b>FITTED</b>	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	0.5543	0.5673	0.5412
	2000	0.5814	0.6006	0.5622
	2001	0.6086	0.6339	0.5833
	2002	0.6357	0.6671	0.6044
5 Point	1998	0.4855	0.4854	0.4854
	1999	0.5265	0.5349	0.5181
	2000	0.5675	0.5844	0.5507
	2001	0.6086	0.6339	0.5833
	2002	0.6496	0.6833	0.6159
6 Point	1997	0.4347	0.4313	0.4380
	1998	0.4784	0.4820	0.4747
	1999	0.5221	0.5328	0.5113
	2000	0.5658	0.5835	0.5480
	2001	0.6095	0.6343	0.5847
	2002	0.6532	0.6850	0.6213
7 Point	1996	0.4126	0.4073	0.4179
	1997	0.4513	0.4519	0.4508
	1998	0.4900	0.4964	0.4836
	1999	0.5287	0.5410	0.5164
	2000	0.5674	0.5856	0.5493
	2001	0.6061	0.6302	0.5821
	2002	0.6448	0.6747	0.6149
8 Point	1995	0.3691	0.3631	0.3750
	1996	0.4087	0.4076	0.4099
	1997	0.4484	0.4521	0.4447
	1998	0.4881	0.4966	0.4796
	1999	0.5278	0.5411	0.5144
	2000	0.5674	0.5856	0.5493
	2001	0.6071	0.6301	0.5841
	2002	0.6468	0.6746	0.6190
9 Point	1994	0.3502	0.3424	0.3581
	1995	0.3862	0.3827	0.3898
	1996	0.4222	0.4230	0.4215
	1997	0.4582	0.4633	0.4532
	1998	0.4942	0.5036	0.4848
	1999	0.5302	0.5439	0.5165
	2000	0.5662	0.5842	0.5482
	2001	0.6022	0.6245	0.5799
	2002	0.6382	0.6648	0.6116
10 Point	1993	0.3294	0.3209	0.3380
	1994	0.3630	0.3582	0.3678
	1995	0.3966	0.3955	0.3977
	1996	0.4302	0.4329	0.4276
	1997	0.4638	0.4702	0.4574
	1998	0.4974	0.5075	0.4873
	1999	0.5310	0.5449	0.5171
	2000	0.5646	0.5822	0.5470
	2001	0.5982	0.6196	0.5769
	2002	0.6318	0.6569	0.6067

INDEMNITY Expon'l <b>FITTED</b>	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	0.5516	0.5623	0.5402
	2000	0.5788	0.5962	0.5610
	2001	0.6074	0.6321	0.5825
	2002	0.6374	0.6702	0.6049
5 Point	1998	0.4838	0.4825	0.4846
	1999	0.5219	0.5280	0.5153
	2000	0.5630	0.5777	0.5479
	2001	0.6074	0.6321	0.5825
	2002	0.6553	0.6917	0.6193
6 Point	1997	0.4364	0.4336	0.4392
	1998	0.4743	0.4766	0.4717
	1999	0.5155	0.5239	0.5067
	2000	0.5603	0.5759	0.5442
	2001	0.6089	0.6331	0.5845
	2002	0.6618	0.6960	0.6278
7 Point	1996	0.4179	0.4142	0.4217
	1997	0.4500	0.4502	0.4497
	1998	0.4846	0.4893	0.4796
	1999	0.5219	0.5319	0.5115
	2000	0.5620	0.5781	0.5455
	2001	0.6052	0.6284	0.5817
	2002	0.6517	0.6830	0.6204
8 Point	1995	0.3771	0.3737	0.3807
	1996	0.4084	0.4078	0.4091
	1997	0.4423	0.4450	0.4396
	1998	0.4791	0.4855	0.4724
	1999	0.5189	0.5298	0.5076
	2000	0.5620	0.5781	0.5455
	2001	0.6087	0.6308	0.5862
	2002	0.6592	0.6883	0.6299
9 Point	1994	0.3615	0.3568	0.3665
	1995	0.3889	0.3865	0.3915
	1996	0.4185	0.4187	0.4182
	1997	0.4502	0.4536	0.4467
	1998	0.4844	0.4914	0.4771
	1999	0.5212	0.5324	0.5096
	2000	0.5607	0.5767	0.5444
	2001	0.6033	0.6248	0.5815
	2002	0.6491	0.6768	0.6211
10 Point	1993	0.3435	0.3384	0.3488
	1994	0.3683	0.3651	0.3716
	1995	0.3948	0.3938	0.3959
	1996	0.4233	0.4248	0.4218
	1997	0.4539	0.4582	0.4494
	1998	0.4867	0.4942	0.4788
	1999	0.5218	0.5331	0.5101
	2000	0.5594	0.5751	0.5434
	2001	0.5998	0.6203	0.5790
	2002	0.6431	0.6691	0.6168

MEDICAL Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	0.6477	0.6755	0.6197
	2000	0.6958	0.7336	0.6579
	2001	0.7440	0.7917	0.6961
	2002	0.7921	0.8498	0.7343
5 Point	1998	0.5777	0.5950	0.5603
	1999	0.6332	0.6606	0.6056
	2000	0.6886	0.7262	0.6508
	2001	0.7440	0.7917	0.6961
	2002	0.7994	0.8573	0.7413
6 Point	1997	0.4991	0.5143	0.4838
	1998	0.5608	0.5840	0.5376
	1999	0.6226	0.6537	0.5914
	2000	0.6843	0.7234	0.6451
	2001	0.7461	0.7931	0.6989
	2002	0.8078	0.8628	0.7527
7 Point	1996	0.4446	0.4585	0.4306
	1997	0.5047	0.5250	0.4842
	1998	0.5647	0.5915	0.5379
	1999	0.6248	0.6580	0.5915
	2000	0.6849	0.7245	0.6452
	2001	0.7450	0.7910	0.6988
	2002	0.8050	0.8574	0.7525
8 Point	1995	0.3787	0.3853	0.3720
	1996	0.4399	0.4531	0.4266
	1997	0.5012	0.5210	0.4813
	1998	0.5624	0.5888	0.5359
	1999	0.6236	0.6566	0.5905
	2000	0.6849	0.7245	0.6452
	2001	0.7461	0.7923	0.6998
2002	0.8074	0.8602	0.7545	
9 Point	1994	0.3356	0.3359	0.3352
	1995	0.3936	0.4004	0.3867
	1996	0.4516	0.4650	0.4382
	1997	0.5097	0.5296	0.4897
	1998	0.5677	0.5942	0.5412
	1999	0.6258	0.6588	0.5926
	2000	0.6838	0.7234	0.6441
	2001	0.7419	0.7880	0.6956
	2002	0.7999	0.8526	0.7471
10 Point	1993	0.2985	0.2955	0.3015
	1994	0.3532	0.3563	0.3502
	1995	0.4080	0.4170	0.3989
	1996	0.4627	0.4778	0.4476
	1997	0.5174	0.5385	0.4962
	1998	0.5722	0.5993	0.5449
	1999	0.6269	0.6601	0.5936
	2000	0.6816	0.7208	0.6423
	2001	0.7363	0.7816	0.6909
	2002	0.7911	0.8424	0.7396

MEDICAL Expon'l <b>FITTED</b>	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	0.6467	0.6739	0.6193
	2000	0.6928	0.7293	0.6560
	2001	0.7422	0.7892	0.6949
	2002	0.7951	0.8541	0.7362
5 Point	1998	0.5791	0.5968	0.5612
	1999	0.6290	0.6550	0.6027
	2000	0.6833	0.7190	0.6472
	2001	0.7422	0.7892	0.6949
	2002	0.8062	0.8663	0.7462
6 Point	1997	0.5034	0.5206	0.4863
	1998	0.5554	0.5783	0.5325
	1999	0.6129	0.6423	0.5832
	2000	0.6762	0.7134	0.6387
	2001	0.7461	0.7923	0.6995
	2002	0.8232	0.8801	0.7661
7 Point	1996	0.4547	0.4714	0.4380
	1997	0.5021	0.5229	0.4812
	1998	0.5545	0.5801	0.5287
	1999	0.6122	0.6434	0.5808
	2000	0.6760	0.7137	0.6381
	2001	0.7465	0.7916	0.7010
	2002	0.8242	0.8781	0.7701
8 Point	1995	0.3941	0.4038	0.3843
	1996	0.4390	0.4525	0.4254
	1997	0.4890	0.5071	0.4707
	1998	0.5448	0.5683	0.5210
	1999	0.6069	0.6368	0.5765
	2000	0.6760	0.7137	0.6381
	2001	0.7531	0.7998	0.7061
2002	0.8389	0.8963	0.7815	
9 Point	1994	0.3581	0.3625	0.3538
	1995	0.3981	0.4058	0.3902
	1996	0.4425	0.4543	0.4305
	1997	0.4919	0.5086	0.4748
	1998	0.5467	0.5693	0.5238
	1999	0.6077	0.6373	0.5778
	2000	0.6755	0.7134	0.6374
	2001	0.7509	0.7986	0.7031
	2002	0.8347	0.8940	0.7755
10 Point	1993	0.3277	0.3298	0.3256
	1994	0.3632	0.3681	0.3583
	1995	0.4027	0.4109	0.3943
	1996	0.4464	0.4587	0.4339
	1997	0.4949	0.5120	0.4775
	1998	0.5487	0.5715	0.5255
	1999	0.6083	0.6379	0.5783
	2000	0.6743	0.7121	0.6363
	2001	0.7476	0.7948	0.7002
	2002	0.8288	0.8872	0.7706

INDEMNITY Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	-0.0354	-0.0505	-0.0203
	2000	0.0629	0.0827	0.0431
	2001	-0.0196	-0.0139	-0.0253
	2002	-0.0079	-0.0183	0.0025
5 Point	1998	-0.0278	-0.0324	-0.0231
	1999	-0.0076	-0.0181	0.0028
	2000	0.0768	0.0989	0.0546
	2001	-0.0196	-0.0139	-0.0253
	2002	-0.0218	-0.0345	-0.0090
6 Point	1997	-0.0089	-0.0043	-0.0134
	1998	-0.0207	-0.0290	-0.0124
	1999	-0.0032	-0.0160	0.0096
	2000	0.0785	0.0998	0.0573
	2001	-0.0205	-0.0143	-0.0267
	2002	-0.0254	-0.0362	-0.0144
7 Point	1996	0.0249	0.0309	0.0191
	1997	-0.0255	-0.0249	-0.0261
	1998	-0.0323	-0.0434	-0.0213
	1999	-0.0098	-0.0242	0.0045
	2000	0.0769	0.0977	0.0560
	2001	-0.0171	-0.0102	-0.0241
	2002	-0.0170	-0.0259	-0.0080
8 Point	1995	-0.0067	0.0006	-0.0141
	1996	0.0288	0.0306	0.0271
	1997	-0.0226	-0.0251	-0.0201
	1998	-0.0304	-0.0436	-0.0173
	1999	-0.0088	-0.0243	0.0065
	2000	0.0769	0.0977	0.0560
	2001	-0.0181	-0.0101	-0.0261
	2002	-0.0190	-0.0258	-0.0121
9 Point	1994	0.0344	0.0392	0.0296
	1995	-0.0239	-0.0190	-0.0289
	1996	0.0153	0.0152	0.0155
	1997	-0.0324	-0.0363	-0.0286
	1998	-0.0365	-0.0506	-0.0225
	1999	-0.0113	-0.0271	0.0044
	2000	0.0781	0.0991	0.0571
	2001	-0.0132	-0.0045	-0.0219
	2002	-0.0104	-0.0160	-0.0047
10 Point	1993	0.0287	0.0355	0.0219
	1994	0.0216	0.0234	0.0199
	1995	-0.0343	-0.0318	-0.0368
	1996	0.0073	0.0053	0.0094
	1997	-0.0380	-0.0432	-0.0328
	1998	-0.0397	-0.0545	-0.0250
	1999	-0.0121	-0.0281	0.0038
	2000	0.0797	0.1011	0.0583
	2001	-0.0092	0.0004	-0.0189
	2002	-0.0040	-0.0081	0.0002

INDEMNITY Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	-0.0327	-0.0455	-0.0193
	2000	0.0655	0.0871	0.0443
	2001	-0.0184	-0.0121	-0.0245
	2002	-0.0096	-0.0214	0.0020
5 Point	1998	-0.0261	-0.0295	-0.0223
	1999	-0.0030	-0.0112	0.0056
	2000	0.0813	0.1056	0.0574
	2001	-0.0184	-0.0121	-0.0245
	2002	-0.0275	-0.0429	-0.0124
6 Point	1997	-0.0106	-0.0066	-0.0146
	1998	-0.0166	-0.0236	-0.0094
	1999	0.0034	-0.0071	0.0142
	2000	0.0840	0.1074	0.0611
	2001	-0.0199	-0.0131	-0.0265
	2002	-0.0340	-0.0472	-0.0209
7 Point	1996	0.0196	0.0240	0.0153
	1997	-0.0242	-0.0232	-0.0251
	1998	-0.0269	-0.0363	-0.0173
	1999	-0.0030	-0.0151	0.0094
	2000	0.0823	0.1052	0.0598
	2001	-0.0162	-0.0084	-0.0237
	2002	-0.0239	-0.0342	-0.0135
8 Point	1995	-0.0148	-0.0100	-0.0198
	1996	0.0291	0.0304	0.0279
	1997	-0.0165	-0.0180	-0.0150
	1998	-0.0214	-0.0325	-0.0101
	1999	0.0000	-0.0130	0.0133
	2000	0.0823	0.1052	0.0598
	2001	-0.0197	-0.0108	-0.0282
	2002	-0.0314	-0.0395	-0.0230
9 Point	1994	0.0231	0.0248	0.0212
	1995	-0.0266	-0.0228	-0.0306
	1996	0.0190	0.0195	0.0188
	1997	-0.0244	-0.0266	-0.0221
	1998	-0.0267	-0.0384	-0.0148
	1999	-0.0023	-0.0156	0.0113
	2000	0.0836	0.1066	0.0609
	2001	-0.0143	-0.0048	-0.0235
	2002	-0.0213	-0.0280	-0.0142
10 Point	1993	0.0146	0.0180	0.0111
	1994	0.0163	0.0165	0.0161
	1995	-0.0325	-0.0301	-0.0350
	1996	0.0142	0.0134	0.0152
	1997	-0.0281	-0.0312	-0.0248
	1998	-0.0290	-0.0412	-0.0165
	1999	-0.0029	-0.0163	0.0108
	2000	0.0849	0.1082	0.0619
	2001	-0.0108	-0.0003	-0.0210
	2002	-0.0153	-0.0203	-0.0099



MEDICAL Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	-0.0279	-0.0355	-0.0202
	2000	0.0521	0.0664	0.0377
	2001	-0.0205	-0.0261	-0.0149
	2002	-0.0037	-0.0047	-0.0027
5 Point	1998	-0.0145	-0.0149	-0.0141
	1999	-0.0134	-0.0206	-0.0061
	2000	0.0593	0.0738	0.0448
	2001	-0.0205	-0.0261	-0.0149
	2002	-0.0110	-0.0122	-0.0097
6 Point	1997	-0.0212	-0.0138	-0.0284
	1998	0.0024	-0.0039	0.0086
	1999	-0.0028	-0.0137	0.0081
	2000	0.0636	0.0766	0.0505
	2001	-0.0226	-0.0275	-0.0177
	2002	-0.0194	-0.0177	-0.0211
7 Point	1996	0.0084	0.0161	0.0006
	1997	-0.0268	-0.0245	-0.0288
	1998	-0.0015	-0.0114	0.0083
	1999	-0.0050	-0.0180	0.0080
	2000	0.0630	0.0755	0.0504
	2001	-0.0215	-0.0254	-0.0176
	2002	-0.0166	-0.0123	-0.0209
8 Point	1995	-0.0082	-0.0095	-0.0069
	1996	0.0131	0.0215	0.0046
	1997	-0.0233	-0.0205	-0.0259
	1998	0.0008	-0.0087	0.0103
	1999	-0.0038	-0.0166	0.0090
	2000	0.0630	0.0755	0.0504
	2001	-0.0226	-0.0267	-0.0186
2002	-0.0190	-0.0151	-0.0228	
9 Point	1994	0.0298	0.0303	0.0295
	1995	-0.0231	-0.0246	-0.0216
	1996	0.0014	0.0096	-0.0070
	1997	-0.0318	-0.0291	-0.0343
	1998	-0.0045	-0.0141	0.0050
	1999	-0.0060	-0.0188	0.0069
	2000	0.0641	0.0766	0.0515
	2001	-0.0184	-0.0224	-0.0144
	2002	-0.0115	-0.0075	-0.0155
10 Point	1993	0.0398	0.0459	0.0337
	1994	0.0122	0.0099	0.0145
	1995	-0.0375	-0.0412	-0.0338
	1996	-0.0097	-0.0032	-0.0164
	1997	-0.0395	-0.0380	-0.0408
	1998	-0.0090	-0.0192	0.0013
	1999	-0.0071	-0.0201	0.0059
	2000	0.0663	0.0792	0.0533
	2001	-0.0128	-0.0160	-0.0097
	2002	-0.0027	0.0027	-0.0080

MEDICAL Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-20)
4 Point	1999	-0.0269	-0.0339	-0.0198
	2000	0.0551	0.0707	0.0396
	2001	-0.0187	-0.0236	-0.0137
	2002	-0.0067	-0.0090	-0.0046
5 Point	1998	-0.0159	-0.0167	-0.0150
	1999	-0.0092	-0.0150	-0.0032
	2000	0.0646	0.0810	0.0484
	2001	-0.0187	-0.0236	-0.0137
	2002	-0.0178	-0.0212	-0.0146
6 Point	1997	-0.0255	-0.0201	-0.0309
	1998	0.0078	0.0018	0.0137
	1999	0.0069	-0.0023	0.0163
	2000	0.0717	0.0866	0.0569
	2001	-0.0226	-0.0267	-0.0183
	2002	-0.0348	-0.0350	-0.0345
7 Point	1996	-0.0017	0.0032	-0.0068
	1997	-0.0242	-0.0224	-0.0258
	1998	0.0087	0.0000	0.0175
	1999	0.0076	-0.0034	0.0187
	2000	0.0719	0.0863	0.0575
	2001	-0.0230	-0.0260	-0.0198
	2002	-0.0358	-0.0330	-0.0385
8 Point	1995	-0.0236	-0.0280	-0.0192
	1996	0.0140	0.0221	0.0058
	1997	-0.0111	-0.0066	-0.0153
	1998	0.0184	0.0118	0.0252
	1999	0.0129	0.0032	0.0230
	2000	0.0719	0.0863	0.0575
	2001	-0.0296	-0.0342	-0.0249
2002	-0.0505	-0.0512	-0.0499	
9 Point	1994	0.0073	0.0037	0.0109
	1995	-0.0276	-0.0300	-0.0251
	1996	0.0105	0.0203	0.0007
	1997	-0.0140	-0.0081	-0.0194
	1998	0.0165	0.0108	0.0224
	1999	0.0121	0.0027	0.0217
	2000	0.0724	0.0866	0.0582
	2001	-0.0274	-0.0330	-0.0219
2002	-0.0463	-0.0489	-0.0439	
10 Point	1993	0.0106	0.0116	0.0096
	1994	0.0022	-0.0019	0.0064
	1995	-0.0322	-0.0351	-0.0292
	1996	0.0066	0.0159	-0.0027
	1997	-0.0170	-0.0115	-0.0221
	1998	0.0145	0.0086	0.0207
	1999	0.0115	0.0021	0.0212
	2000	0.0736	0.0879	0.0593
	2001	-0.0241	-0.0292	-0.0190
	2002	-0.0404	-0.0421	-0.0390