

DELAWARE COMPENSATION RATING BUREAU, INC.

Measures of Goodness of Fit in Trend Calculations Using Loss Ratios

Estimates of trended loss 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 loss 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 r ²		(Avg Pd & Inc)	(Incur)	(Pd-2)	(Pd-3)	(Pd-4)	(Pd-5)	(Pd-6)	(Pd-7)	(Pd-8)	(Pd-10)	(Pd-12)	(Pd-14)	(Pd-16)	(Pd-18)	(Pd-20)
4 Point	Linear	0.111	0.012	0.055	0.181	0.122	0.291	0.290	0.291	0.291	0.290	0.290	0.290	0.290	0.291	0.291
5 Point	Linear	0.017	0.003	0.007	0.082	0.038	0.074	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096	0.096
6 Point	Linear	0.146	0.054	0.101	0.281	0.205	0.234	0.254	0.263	0.263	0.263	0.263	0.263	0.263	0.263	0.263
7 Point	Linear	0.098	0.038	0.078	0.240	0.170	0.169	0.177	0.178	0.172	0.173	0.172	0.172	0.172	0.172	0.173
8 Point	Linear	0.112	0.067	0.107	0.284	0.213	0.199	0.203	0.200	0.192	0.157	0.157	0.157	0.157	0.157	0.157
9 Point	Linear	0.259	0.203	0.239	0.442	0.373	0.357	0.361	0.355	0.346	0.301	0.300	0.300	0.301	0.301	0.301
10 Point	Linear	0.384	0.323	0.348	0.547	0.487	0.472	0.475	0.468	0.459	0.421	0.425	0.426	0.426	0.426	0.426
4 Point	Expon'l	0.141	0.022	0.083	0.213	0.150	0.324	0.323	0.324	0.323	0.323	0.323	0.323	0.323	0.324	0.324
5 Point	Expon'l	0.033	0.000	0.022	0.110	0.059	0.101	0.125	0.125	0.125	0.125	0.125	0.126	0.126	0.126	0.126
6 Point	Expon'l	0.168	0.070	0.130	0.296	0.224	0.252	0.272	0.280	0.280	0.280	0.280	0.280	0.280	0.280	0.280
7 Point	Expon'l	0.121	0.055	0.107	0.258	0.191	0.190	0.199	0.200	0.193	0.194	0.194	0.194	0.194	0.194	0.194
8 Point	Expon'l	0.135	0.087	0.137	0.298	0.232	0.217	0.221	0.218	0.211	0.178	0.178	0.178	0.178	0.178	0.178
9 Point	Expon'l	0.271	0.220	0.260	0.437	0.375	0.358	0.361	0.356	0.348	0.307	0.306	0.307	0.307	0.307	0.307
10 Point	Expon'l	0.385	0.332	0.357	0.530	0.477	0.459	0.462	0.455	0.448	0.413	0.417	0.417	0.418	0.418	0.417
MEDICAL r ²		(Avg Pd & Inc)	(Incur)	(Pd-2)	(Pd-3)	(Pd-4)	(Pd-5)	(Pd-6)	(Pd-7)	(Pd-8)	(Pd-10)	(Pd-12)	(Pd-14)	(Pd-16)	(Pd-18)	(Pd-20)
4 Point	Linear	0.436	0.491	0.499	0.590	0.483	0.378	0.378	0.378	0.378	0.378	0.377	0.378	0.377	0.378	0.378
5 Point	Linear	0.006	0.005	0.011	0.026	0.003	0.000	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
6 Point	Linear	0.004	0.000	0.001	0.008	0.001	0.005	0.001	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015
7 Point	Linear	0.159	0.139	0.114	0.091	0.149	0.172	0.163	0.196	0.178	0.179	0.179	0.179	0.179	0.178	0.179
8 Point	Linear	0.312	0.299	0.267	0.242	0.310	0.332	0.330	0.355	0.342	0.321	0.321	0.321	0.321	0.321	0.321
9 Point	Linear	0.265	0.266	0.238	0.214	0.278	0.297	0.300	0.309	0.297	0.259	0.259	0.259	0.259	0.259	0.259
10 Point	Linear	0.031	0.012	0.008	0.003	0.017	0.021	0.022	0.019	0.014	0.005	0.063	0.063	0.063	0.063	0.063
4 Point	Expon'l	0.449	0.500	0.508	0.596	0.495	0.394	0.394	0.394	0.394	0.394	0.393	0.394	0.393	0.394	0.394
5 Point	Expon'l	0.008	0.007	0.014	0.030	0.004	0.000	0.009	0.010	0.009	0.009	0.009	0.009	0.009	0.009	0.009
6 Point	Expon'l	0.002	0.000	0.003	0.012	0.000	0.003	0.000	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
7 Point	Expon'l	0.159	0.138	0.111	0.090	0.151	0.175	0.165	0.199	0.179	0.180	0.180	0.180	0.180	0.179	0.180
8 Point	Expon'l	0.318	0.304	0.269	0.247	0.318	0.343	0.340	0.366	0.351	0.328	0.328	0.328	0.328	0.328	0.328
9 Point	Expon'l	0.263	0.264	0.233	0.211	0.278	0.298	0.301	0.311	0.298	0.257	0.258	0.258	0.258	0.257	0.258
10 Point	Expon'l	0.033	0.015	0.010	0.005	0.020	0.025	0.026	0.023	0.017	0.007	0.061	0.061	0.062	0.061	0.062

MEDICAL Linear RESIDUALS	Policy Year	Loss Ratio (Avg Pd & Inc)	Loss Ratio (Incur)	Loss Ratio (Pd-2)	Loss Ratio (Pd-3)	Loss Ratio (Pd-4)	Loss Ratio (Pd-5)	Loss Ratio (Pd-6)	Loss Ratio (Pd-7)	Loss Ratio (Pd-8)	Loss Ratio (Pd-10)	Loss Ratio (Pd-12)	Loss Ratio (Pd-14)	Loss Ratio (Pd-16)	Loss Ratio (Pd-18)	Loss Ratio (Pd-20)
4 Point	1998	-0.0209	-0.0190	-0.0198	-0.0188	-0.0208	-0.0230	-0.0230	-0.0230	-0.0229	-0.0227	-0.0226	-0.0225	-0.0225	-0.0225	-0.0227
	1999	0.0209	0.0172	0.0176	0.0197	0.0218	0.0248	0.0248	0.0247	0.0246	0.0244	0.0243	0.0242	0.0242	0.0242	0.0244
	2000	0.0209	0.0224	0.0241	0.0171	0.0188	0.0196	0.0196	0.0195	0.0194	0.0193	0.0192	0.0191	0.0190	0.0191	0.0193
	2001	-0.0209	-0.0207	-0.0219	-0.0180	-0.0198	-0.0213	-0.0213	-0.0212	-0.0212	-0.0210	-0.0209	-0.0208	-0.0208	-0.0208	-0.0210
5 Point	1997	-0.0297	-0.0321	-0.0329	-0.0330	-0.0329	-0.0310	-0.0277	-0.0277	-0.0276	-0.0273	-0.0271	-0.0271	-0.0270	-0.0271	-0.0274
	1998	0.0089	0.0131	0.0131	0.0141	0.0121	0.0079	0.0047	0.0047	0.0047	0.0046	0.0046	0.0046	0.0046	0.0046	0.0047
	1999	0.0357	0.0333	0.0341	0.0361	0.0382	0.0403	0.0386	0.0385	0.0384	0.0380	0.0379	0.0377	0.0377	0.0378	0.0381
	2000	0.0209	0.0224	0.0241	0.0171	0.0188	0.0196	0.0196	0.0195	0.0194	0.0193	0.0192	0.0191	0.0190	0.0191	0.0193
	2001	-0.0357	-0.0367	-0.0384	-0.0345	-0.0362	-0.0368	-0.0352	-0.0351	-0.0349	-0.0346	-0.0344	-0.0343	-0.0343	-0.0344	-0.0347
6 Point	1996	-0.0084	-0.0052	-0.0059	-0.0065	-0.0054	-0.0040	-0.0069	-0.0117	-0.0117	-0.0116	-0.0115	-0.0115	-0.0114	-0.0115	-0.0116
	1997	-0.0230	-0.0280	-0.0282	-0.0278	-0.0286	-0.0278	-0.0222	-0.0183	-0.0182	-0.0180	-0.0179	-0.0179	-0.0179	-0.0179	-0.0181
	1998	0.0131	0.0157	0.0161	0.0174	0.0148	0.0099	0.0082	0.0105	0.0105	0.0104	0.0103	0.0103	0.0103	0.0103	0.0105
	1999	0.0374	0.0343	0.0353	0.0374	0.0393	0.0411	0.0400	0.0409	0.0407	0.0404	0.0402	0.0400	0.0400	0.0401	0.0404
	2000	0.0200	0.0219	0.0235	0.0165	0.0182	0.0192	0.0189	0.0183	0.0183	0.0181	0.0180	0.0179	0.0179	0.0180	0.0181
	2001	-0.0391	-0.0388	-0.0408	-0.0370	-0.0384	-0.0384	-0.0380	-0.0397	-0.0396	-0.0393	-0.0390	-0.0389	-0.0389	-0.0390	-0.0393
7 Point	1995	-0.0249	-0.0280	-0.0288	-0.0295	-0.0280	-0.0268	-0.0288	-0.0246	-0.0219	-0.0217	-0.0216	-0.0215	-0.0215	-0.0216	-0.0217
	1996	0.0082	0.0135	0.0132	0.0132	0.0133	0.0139	0.0123	0.0047	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029	0.0029
	1997	-0.0114	-0.0149	-0.0147	-0.0140	-0.0155	-0.0153	-0.0087	-0.0068	-0.0080	-0.0079	-0.0079	-0.0079	-0.0079	-0.0079	-0.0079
	1998	0.0197	0.0232	0.0238	0.0252	0.0222	0.0171	0.0159	0.0171	0.0163	0.0162	0.0161	0.0161	0.0160	0.0161	0.0163
	1999	0.0391	0.0362	0.0372	0.0394	0.0412	0.0428	0.0419	0.0425	0.0422	0.0418	0.0416	0.0414	0.0415	0.0415	0.0419
	2000	0.0167	0.0182	0.0196	0.0126	0.0145	0.0156	0.0150	0.0150	0.0154	0.0152	0.0151	0.0151	0.0150	0.0151	0.0152
	2001	-0.0474	-0.0482	-0.0504	-0.0469	-0.0477	-0.0473	-0.0476	-0.0480	-0.0469	-0.0465	-0.0462	-0.0461	-0.0460	-0.0462	-0.0466
8 Point	1994	-0.0123	-0.0149	-0.0156	-0.0164	-0.0146	-0.0137	-0.0151	-0.0123	-0.0131	-0.0096	-0.0096	-0.0095	-0.0095	-0.0096	-0.0096
	1995	-0.0179	-0.0195	-0.0199	-0.0201	-0.0196	-0.0190	-0.0202	-0.0176	-0.0143	-0.0162	-0.0161	-0.0160	-0.0160	-0.0161	-0.0162
	1996	0.0135	0.0199	0.0199	0.0203	0.0195	0.0198	0.0187	0.0099	0.0085	0.0070	0.0070	0.0069	0.0070	0.0070	0.0070
	1997	-0.0079	-0.0106	-0.0103	-0.0093	-0.0113	-0.0114	-0.0044	-0.0033	-0.0043	-0.0052	-0.0051	-0.0052	-0.0051	-0.0051	-0.0052
	1998	0.0215	0.0253	0.0260	0.0276	0.0243	0.0190	0.0180	0.0189	0.0182	0.0176	0.0174	0.0174	0.0174	0.0175	0.0176
	1999	0.0391	0.0362	0.0372	0.0394	0.0412	0.0428	0.0420	0.0425	0.0422	0.0418	0.0416	0.0414	0.0415	0.0415	0.0418
	2000	0.0149	0.0160	0.0174	0.0102	0.0124	0.0136	0.0129	0.0133	0.0135	0.0138	0.0138	0.0137	0.0137	0.0137	0.0139
	2001	-0.0509	-0.0524	-0.0548	-0.0516	-0.0519	-0.0512	-0.0519	-0.0515	-0.0506	-0.0492	-0.0490	-0.0488	-0.0487	-0.0489	-0.0493
9 Point	1993	0.0162	0.0150	0.0144	0.0135	0.0154	0.0162	0.0152	0.0171	0.0163	0.0174	0.0174	0.0173	0.0173	0.0174	0.0175
	1994	-0.0204	-0.0224	-0.0228	-0.0232	-0.0223	-0.0218	-0.0227	-0.0208	-0.0213	-0.0184	-0.0183	-0.0182	-0.0182	-0.0183	-0.0184
	1995	-0.0243	-0.0254	-0.0255	-0.0254	-0.0256	-0.0254	-0.0262	-0.0243	-0.0207	-0.0231	-0.0229	-0.0228	-0.0228	-0.0229	-0.0231
	1996	0.0089	0.0156	0.0158	0.0164	0.0151	0.0152	0.0144	0.0051	0.0039	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020
	1997	-0.0108	-0.0133	-0.0129	-0.0117	-0.0141	-0.0143	-0.0072	-0.0063	-0.0072	-0.0083	-0.0082	-0.0082	-0.0082	-0.0082	-0.0083
	1998	0.0203	0.0243	0.0250	0.0266	0.0232	0.0179	0.0169	0.0176	0.0170	0.0163	0.0162	0.0162	0.0161	0.0162	0.0164
	1999	0.0396	0.0367	0.0377	0.0399	0.0417	0.0434	0.0425	0.0431	0.0428	0.0424	0.0422	0.0420	0.0421	0.0422	0.0425
	2000	0.0173	0.0182	0.0195	0.0121	0.0146	0.0160	0.0151	0.0157	0.0158	0.0163	0.0162	0.0162	0.0161	0.0162	0.0164
	2001	-0.0468	-0.0487	-0.0512	-0.0482	-0.0480	-0.0472	-0.0481	-0.0472	-0.0466	-0.0449	-0.0446	-0.0445	-0.0444	-0.0446	-0.0450
10 Point	1992	0.0485	0.0588	0.0582	0.0573	0.0592	0.0599	0.0593	0.0605	0.0597	0.0586	0.0379	0.0378	0.0377	0.0378	0.0381
	1993	-0.0053	-0.0111	-0.0115	-0.0120	-0.0109	-0.0105	-0.0111	-0.0098	-0.0103	-0.0086	0.0005	0.0005	0.0005	0.0005	0.0005
	1994	-0.0379	-0.0436	-0.0438	-0.0439	-0.0437	-0.0434	-0.0441	-0.0427	-0.0428	-0.0395	-0.0320	-0.0318	-0.0318	-0.0320	-0.0321
	1995	-0.0377	-0.0418	-0.0417	-0.0413	-0.0421	-0.0420	-0.0427	-0.0411	-0.0373	-0.0393	-0.0334	-0.0333	-0.0333	-0.0334	-0.0337
	1996	-0.0006	0.0042	0.0045	0.0053	0.0036	0.0035	0.0028	-0.0067	-0.0077	-0.0094	-0.0053	-0.0053	-0.0053	-0.0053	-0.0054
	1997	-0.0162	-0.0198	-0.0193	-0.0181	-0.0206	-0.0209	-0.0137	-0.0131	-0.0138	-0.0148	-0.0124	-0.0124	-0.0124	-0.0124	-0.0125
	1998	0.0190	0.0226	0.0234	0.0250	0.0216	0.0162	0.0153	0.0160	0.0154	0.0147	0.0151	0.0151	0.0151	0.0152	0.0153
	1999	0.0423	0.0400	0.0410	0.0431	0.0450	0.0467	0.0458	0.0465	0.0461	0.0457	0.0443	0.0441	0.0442	0.0443	0.0446
	2000	0.0240	0.0264	0.0275	0.0201	0.0228	0.0243	0.0233	0.0241	0.0241	0.0245	0.0215	0.0214	0.0214	0.0214	0.0217
	2001	-0.0360	-0.0356	-0.0383	-0.0355	-0.0349	-0.0339	-0.0349	-0.0337	-0.0333	-0.0319	-0.0362	-0.0361	-0.0360	-0.0362	-0.0365

