

DELAWARE COMPENSATION RATING BUREAU, INC.

Measures of Goodness of Fit in Trend Calculations Using Severity Ratios – Unlimited 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	0.697	0.543	0.562
5 Point	Linear	0.651	0.497	0.578
6 Point	Linear	0.758	0.643	0.665
7 Point	Linear	0.778	0.688	0.684
8 Point	Linear	0.543	0.479	0.480
9 Point	Linear	0.595	0.529	0.542
10 Point	Linear	0.100	0.122	0.055
4 Point	Expon'l	0.692	0.548	0.569
5 Point	Expon'l	0.640	0.492	0.579
6 Point	Expon'l	0.752	0.645	0.668
7 Point	Expon'l	0.776	0.694	0.687
8 Point	Expon'l	0.533	0.473	0.477
9 Point	Expon'l	0.590	0.527	0.541
10 Point	Expon'l	0.103	0.122	0.058

MEDICAL		(Average)	(Incur)	(Pd-21)
r ²				
4 Point	Linear	0.871	0.798	0.928
5 Point	Linear	0.819	0.754	0.869
6 Point	Linear	0.822	0.742	0.880
7 Point	Linear	0.878	0.829	0.911
8 Point	Linear	0.869	0.841	0.883
9 Point	Linear	0.906	0.887	0.914
10 Point	Linear	0.873	0.856	0.881
4 Point	Expon'l	0.845	0.778	0.901
5 Point	Expon'l	0.791	0.725	0.845
6 Point	Expon'l	0.805	0.716	0.872
7 Point	Expon'l	0.875	0.819	0.915
8 Point	Expon'l	0.874	0.840	0.894
9 Point	Expon'l	0.911	0.888	0.925
10 Point	Expon'l	0.881	0.859	0.895

INDEMNITY Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	0.7907	0.7839	0.7977
	2007	0.8211	0.8207	0.8217
	2008	0.8516	0.8575	0.8457
	2009	0.8820	0.8943	0.8697
5 Point	2005	0.7846	0.7794	0.7899
	2006	0.8069	0.8054	0.8085
	2007	0.8292	0.8314	0.8271
	2008	0.8516	0.8575	0.8457
	2009	0.8739	0.8835	0.8643
6 Point	2004	0.7640	0.7513	0.7767
	2005	0.7858	0.7779	0.7938
	2006	0.8077	0.8045	0.8110
	2007	0.8295	0.8311	0.8281
	2008	0.8514	0.8576	0.8452
	2009	0.8733	0.8842	0.8623
7 Point	2003	0.7532	0.7366	0.7697
	2004	0.7725	0.7605	0.7845
	2005	0.7918	0.7843	0.7993
	2006	0.8111	0.8081	0.8141
	2007	0.8304	0.8320	0.8289
	2008	0.8497	0.8558	0.8437
	2009	0.8690	0.8796	0.8585
8 Point	2002	0.7645	0.7507	0.7782
	2003	0.7777	0.7670	0.7883
	2004	0.7909	0.7832	0.7985
	2005	0.8041	0.7995	0.8086
	2006	0.8172	0.8157	0.8187
	2007	0.8304	0.8320	0.8289
	2008	0.8436	0.8482	0.8390
	2009	0.8567	0.8645	0.8491
	9 Point	2001	0.7559	0.7409
2002		0.7683	0.7560	0.7806
2003		0.7807	0.7711	0.7902
2004		0.7930	0.7862	0.7998
2005		0.8054	0.8014	0.8095
2006		0.8178	0.8165	0.8191
2007		0.8301	0.8316	0.8287
2008		0.8425	0.8467	0.8383
2009		0.8549	0.8618	0.8479
10 Point	2000	0.7904	0.7784	0.8024
	2001	0.7954	0.7852	0.8055
	2002	0.8003	0.7920	0.8087
	2003	0.8053	0.7988	0.8118
	2004	0.8103	0.8056	0.8149
	2005	0.8153	0.8124	0.8181
	2006	0.8202	0.8192	0.8212
	2007	0.8252	0.8260	0.8244
	2008	0.8302	0.8329	0.8275
	2009	0.8351	0.8397	0.8307

INDEMNITY Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	0.7900	0.7829	0.7971
	2007	0.8199	0.8187	0.8208
	2008	0.8510	0.8561	0.8453
	2009	0.8833	0.8951	0.8704
5 Point	2005	0.7847	0.7796	0.7899
	2006	0.8062	0.8043	0.8079
	2007	0.8283	0.8298	0.8264
	2008	0.8510	0.8561	0.8453
	2009	0.8743	0.8832	0.8646
6 Point	2004	0.7647	0.7524	0.7772
	2005	0.7854	0.7772	0.7935
	2006	0.8066	0.8027	0.8103
	2007	0.8285	0.8291	0.8273
	2008	0.8509	0.8564	0.8448
	2009	0.8739	0.8845	0.8626
7 Point	2003	0.7544	0.7385	0.7704
	2004	0.7724	0.7604	0.7845
	2005	0.7910	0.7829	0.7987
	2006	0.8099	0.8061	0.8133
	2007	0.8293	0.8300	0.8281
	2008	0.8492	0.8546	0.8432
	2009	0.8695	0.8799	0.8585
8 Point	2002	0.7654	0.7522	0.7788
	2003	0.7778	0.7671	0.7884
	2004	0.7904	0.7824	0.7982
	2005	0.8031	0.7980	0.8080
	2006	0.8161	0.8138	0.8180
	2007	0.8293	0.8300	0.8281
	2008	0.8427	0.8465	0.8383
	2009	0.8563	0.8633	0.8487
	9 Point	2001	0.7571	0.7427
2002		0.7686	0.7566	0.7808
2003		0.7804	0.7706	0.7900
2004		0.7923	0.7850	0.7993
2005		0.8044	0.7996	0.8088
2006		0.8166	0.8145	0.8183
2007		0.8291	0.8297	0.8280
2008		0.8417	0.8451	0.8377
2009		0.8545	0.8608	0.8476
10 Point	2000	0.7893	0.7775	0.8014
	2001	0.7942	0.7840	0.8045
	2002	0.7991	0.7906	0.8077
	2003	0.8041	0.7972	0.8109
	2004	0.8090	0.8038	0.8140
	2005	0.8140	0.8105	0.8172
	2006	0.8191	0.8173	0.8204
	2007	0.8241	0.8241	0.8237
	2008	0.8292	0.8309	0.8269
	2009	0.8343	0.8379	0.8301

MEDICAL Linear FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	1.5835	1.6596	1.5073
	2007	1.7899	1.8535	1.7263
	2008	1.9963	2.0473	1.9453
	2009	2.2028	2.2412	2.1643
5 Point	2005	1.5225	1.6075	1.4374
	2006	1.6805	1.7541	1.6067
	2007	1.8384	1.9007	1.7760
	2008	1.9963	2.0473	1.9453
	2009	2.1543	2.1939	2.1146
6 Point	2004	1.4516	1.5603	1.3428
	2005	1.5858	1.6798	1.4917
	2006	1.7200	1.7993	1.6406
	2007	1.8542	1.9188	1.7896
	2008	1.9884	2.0383	1.9385
	2009	2.1226	2.1578	2.0875
7 Point	2003	1.3238	1.4237	1.2239
	2004	1.4566	1.5471	1.3659
	2005	1.5893	1.6706	1.5079
	2006	1.7220	1.7940	1.6499
	2007	1.8547	1.9175	1.7919
	2008	1.9874	2.0409	1.9339
	2009	2.1202	2.1644	2.0759
8 Point	2002	1.2670	1.3583	1.1755
	2003	1.3845	1.4701	1.2988
	2004	1.5021	1.5820	1.4221
	2005	1.6196	1.6938	1.5454
	2006	1.7372	1.8057	1.6686
	2007	1.8547	1.9175	1.7919
	2008	1.9723	2.0293	1.9152
	2009	2.0898	2.1412	2.0384
9 Point	2001	1.1443	1.2334	1.0550
	2002	1.2627	1.3475	1.1778
	2003	1.3812	1.4617	1.3006
	2004	1.4996	1.5758	1.4234
	2005	1.6181	1.6900	1.5462
	2006	1.7366	1.8041	1.6689
	2007	1.8550	1.9183	1.7917
	2008	1.9735	2.0324	1.9145
	2009	2.0919	2.1466	2.0373
10 Point	2000	1.1143	1.2048	1.0238
	2001	1.2188	1.3054	1.1321
	2002	1.3233	1.4061	1.2404
	2003	1.4278	1.5067	1.3488
	2004	1.5322	1.6073	1.4571
	2005	1.6367	1.7080	1.5654
	2006	1.7412	1.8086	1.6738
	2007	1.8457	1.9093	1.7821
	2008	1.9502	2.0099	1.8904
	2009	2.0547	2.1105	1.9988

MEDICAL Expon'l FITTED	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	1.5793	1.6514	1.5074
	2007	1.7711	1.8347	1.7073
	2008	1.9862	2.0384	1.9336
	2009	2.2274	2.2647	2.1899
5 Point	2005	1.5315	1.6123	1.4509
	2006	1.6701	1.7434	1.5967
	2007	1.8213	1.8851	1.7571
	2008	1.9862	2.0384	1.9336
	2009	2.1660	2.2041	2.1278
6 Point	2004	1.4692	1.5727	1.3660
	2005	1.5826	1.6760	1.4888
	2006	1.7047	1.7861	1.6226
	2007	1.8363	1.9035	1.7684
	2008	1.9781	2.0285	1.9274
	2009	2.1308	2.1618	2.1006
7 Point	2003	1.3487	1.4419	1.2558
	2004	1.4565	1.5449	1.3680
	2005	1.5730	1.6552	1.4903
	2006	1.6989	1.7734	1.6236
	2007	1.8347	1.9001	1.7687
	2008	1.9815	2.0358	1.9268
	2009	2.1400	2.1812	2.0990
8 Point	2002	1.2992	1.3841	1.2145
	2003	1.3920	1.4747	1.3093
	2004	1.4915	1.5711	1.4116
	2005	1.5981	1.6739	1.5218
	2006	1.7124	1.7834	1.6406
	2007	1.8347	1.9001	1.7687
	2008	1.9659	2.0244	1.9068
	2009	2.1064	2.1568	2.0556
	9 Point	2001	1.1829	1.2654
2002		1.2730	1.3545	1.1915
2003		1.3699	1.4498	1.2898
2004		1.4743	1.5518	1.3963
2005		1.5866	1.6610	1.5114
2006		1.7074	1.7779	1.6361
2007		1.8374	1.9030	1.7711
2008		1.9774	2.0370	1.9172
2009		2.1279	2.1803	2.0754
10 Point	2000	1.1592	1.2430	1.0759
	2001	1.2371	1.3200	1.1543
	2002	1.3201	1.4018	1.2385
	2003	1.4088	1.4886	1.3287
	2004	1.5034	1.5808	1.4256
	2005	1.6044	1.6787	1.5295
	2006	1.7122	1.7826	1.6410
	2007	1.8272	1.8930	1.7606
	2008	1.9499	2.0103	1.8889
	2009	2.0809	2.1348	2.0266

INDEMNITY Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0231	-0.0257	-0.0205
	2007	0.0371	0.0584	0.0156
	2008	-0.0048	-0.0398	0.0305
	2009	-0.0092	0.0071	-0.0255
5 Point	2005	0.0162	0.0215	0.0107
	2006	-0.0393	-0.0472	-0.0313
	2007	0.0290	0.0476	0.0102
	2008	-0.0048	-0.0398	0.0305
	2009	-0.0011	0.0178	-0.0201
6 Point	2004	0.0015	-0.0018	0.0050
	2005	0.0150	0.0230	0.0068
	2006	-0.0401	-0.0463	-0.0338
	2007	0.0287	0.0479	0.0092
	2008	-0.0046	-0.0399	0.0310
	2009	-0.0005	0.0171	-0.0181
7 Point	2003	0.0127	0.0137	0.0116
	2004	-0.0070	-0.0110	-0.0028
	2005	0.0090	0.0166	0.0013
	2006	-0.0435	-0.0499	-0.0369
	2007	0.0278	0.0470	0.0084
	2008	-0.0029	-0.0381	0.0325
	2009	0.0038	0.0217	-0.0143
8 Point	2002	0.0430	0.0532	0.0327
	2003	-0.0118	-0.0167	-0.0070
	2004	-0.0254	-0.0337	-0.0168
	2005	-0.0033	0.0014	-0.0080
	2006	-0.0496	-0.0575	-0.0415
	2007	0.0278	0.0470	0.0084
	2008	0.0032	-0.0305	0.0372
	2009	0.0161	0.0368	-0.0049
	9 Point	2001	0.0076	0.0105
2002		0.0392	0.0479	0.0303
2003		-0.0148	-0.0208	-0.0089
2004		-0.0275	-0.0367	-0.0181
2005		-0.0046	-0.0005	-0.0089
2006		-0.0502	-0.0583	-0.0419
2007		0.0281	0.0474	0.0086
2008		0.0043	-0.0290	0.0379
2009		0.0179	0.0395	-0.0037
10 Point	2000	0.0887	0.0998	0.0777
	2001	-0.0319	-0.0338	-0.0298
	2002	0.0072	0.0119	0.0022
	2003	-0.0394	-0.0485	-0.0305
	2004	-0.0448	-0.0561	-0.0332
	2005	-0.0145	-0.0115	-0.0175
	2006	-0.0526	-0.0610	-0.0440
	2007	0.0330	0.0530	0.0129
	2008	0.0166	-0.0152	0.0487
	2009	0.0377	0.0616	0.0135

INDEMNITY Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0224	-0.0247	-0.0199
	2007	0.0383	0.0603	0.0165
	2008	-0.0042	-0.0384	0.0309
	2009	-0.0105	0.0062	-0.0262
5 Point	2005	0.0161	0.0213	0.0107
	2006	-0.0386	-0.0461	-0.0307
	2007	0.0299	0.0492	0.0109
	2008	-0.0042	-0.0384	0.0309
	2009	-0.0015	0.0181	-0.0204
6 Point	2004	0.0008	-0.0029	0.0045
	2005	0.0154	0.0237	0.0071
	2006	-0.0390	-0.0445	-0.0331
	2007	0.0297	0.0499	0.0100
	2008	-0.0041	-0.0387	0.0314
	2009	-0.0011	0.0168	-0.0184
7 Point	2003	0.0115	0.0118	0.0109
	2004	-0.0069	-0.0109	-0.0028
	2005	0.0098	0.0180	0.0019
	2006	-0.0423	-0.0479	-0.0361
	2007	0.0289	0.0490	0.0092
	2008	-0.0024	-0.0369	0.0330
	2009	0.0033	0.0214	-0.0143
8 Point	2002	0.0421	0.0517	0.0321
	2003	-0.0119	-0.0168	-0.0071
	2004	-0.0249	-0.0329	-0.0165
	2005	-0.0023	0.0029	-0.0074
	2006	-0.0485	-0.0556	-0.0408
	2007	0.0289	0.0490	0.0092
	2008	0.0041	-0.0288	0.0379
	2009	0.0165	0.0380	-0.0045
	9 Point	2001	0.0064	0.0087
2002		0.0389	0.0473	0.0301
2003		-0.0145	-0.0203	-0.0087
2004		-0.0268	-0.0355	-0.0176
2005		-0.0036	0.0013	-0.0082
2006		-0.0490	-0.0563	-0.0411
2007		0.0291	0.0493	0.0093
2008		0.0051	-0.0274	0.0385
2009		0.0183	0.0405	-0.0034
10 Point	2000	0.0898	0.1007	0.0787
	2001	-0.0307	-0.0326	-0.0288
	2002	0.0084	0.0133	0.0032
	2003	-0.0382	-0.0469	-0.0296
	2004	-0.0435	-0.0543	-0.0323
	2005	-0.0132	-0.0096	-0.0166
	2006	-0.0515	-0.0591	-0.0432
	2007	0.0341	0.0549	0.0136
	2008	0.0176	-0.0132	0.0493
	2009	0.0385	0.0634	0.0141

MEDICAL Linear RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0943	-0.1159	-0.0726
	2007	0.1080	0.1328	0.0831
	2008	0.0669	0.0820	0.0515
	2009	-0.0806	-0.0989	-0.0620
5 Point	2005	0.0970	0.0946	0.0994
	2006	-0.1913	-0.2104	-0.1720
	2007	0.0595	0.0856	0.0334
	2008	0.0669	0.0820	0.0515
	2009	-0.0321	-0.0516	-0.0123
6 Point	2004	0.0791	0.0904	0.0679
	2005	0.0337	0.0223	0.0451
	2006	-0.2308	-0.2556	-0.2059
	2007	0.0437	0.0675	0.0198
	2008	0.0748	0.0910	0.0583
	2009	-0.0004	-0.0155	0.0148
7 Point	2003	0.0075	-0.0198	0.0347
	2004	0.0741	0.1036	0.0448
	2005	0.0302	0.0315	0.0289
	2006	-0.2328	-0.2503	-0.2152
	2007	0.0432	0.0688	0.0175
	2008	0.0758	0.0884	0.0629
	2009	0.0020	-0.0221	0.0264
8 Point	2002	0.1062	0.0813	0.1311
	2003	-0.0532	-0.0662	-0.0402
	2004	0.0286	0.0687	-0.0114
	2005	-0.0001	0.0083	-0.0086
	2006	-0.2480	-0.2620	-0.2339
	2007	0.0432	0.0688	0.0175
	2008	0.0909	0.1000	0.0816
	2009	0.0324	0.0011	0.0639
9 Point	2001	-0.0086	-0.0216	0.0045
	2002	0.1105	0.0921	0.1288
	2003	-0.0499	-0.0578	-0.0420
	2004	0.0311	0.0749	-0.0127
	2005	0.0014	0.0121	-0.0094
	2006	-0.2474	-0.2604	-0.2342
	2007	0.0429	0.0680	0.0177
	2008	0.0897	0.0969	0.0823
	2009	0.0303	-0.0043	0.0650
10 Point	2000	0.1677	0.1621	0.1735
	2001	-0.0831	-0.0936	-0.0726
	2002	0.0499	0.0335	0.0662
	2003	-0.0965	-0.1028	-0.0902
	2004	-0.0015	0.0434	-0.0464
	2005	-0.0172	-0.0059	-0.0286
	2006	-0.2520	-0.2649	-0.2391
	2007	0.0522	0.0770	0.0273
	2008	0.1130	0.1194	0.1064
	2009	0.0675	0.0318	0.1035

MEDICAL Expon'l RESIDUALS	Policy Year	Severity Ratio (Average)	Severity Ratio (Incur)	Severity Ratio (Pd-21)
4 Point	2006	-0.0901	-0.1077	-0.0727
	2007	0.1268	0.1516	0.1021
	2008	0.0770	0.0909	0.0632
	2009	-0.1052	-0.1224	-0.0876
5 Point	2005	0.0880	0.0898	0.0859
	2006	-0.1809	-0.1997	-0.1620
	2007	0.0766	0.1012	0.0523
	2008	0.0770	0.0909	0.0632
	2009	-0.0438	-0.0618	-0.0255
6 Point	2004	0.0615	0.0780	0.0447
	2005	0.0369	0.0261	0.0480
	2006	-0.2155	-0.2424	-0.1879
	2007	0.0616	0.0828	0.0410
	2008	0.0851	0.1008	0.0694
	2009	-0.0086	-0.0195	0.0017
7 Point	2003	-0.0174	-0.0380	0.0028
	2004	0.0742	0.1058	0.0427
	2005	0.0465	0.0469	0.0465
	2006	-0.2097	-0.2297	-0.1889
	2007	0.0632	0.0862	0.0407
	2008	0.0817	0.0935	0.0700
	2009	-0.0178	-0.0389	0.0033
8 Point	2002	0.0740	0.0555	0.0921
	2003	-0.0607	-0.0708	-0.0507
	2004	0.0392	0.0796	-0.0009
	2005	0.0214	0.0282	0.0150
	2006	-0.2232	-0.2397	-0.2059
	2007	0.0632	0.0862	0.0407
	2008	0.0973	0.1049	0.0900
	2009	0.0158	-0.0145	0.0467
	9 Point	2001	-0.0472	-0.0536
2002		0.1002	0.0851	0.1151
2003		-0.0386	-0.0459	-0.0312
2004		0.0564	0.0989	0.0144
2005		0.0329	0.0411	0.0254
2006		-0.2182	-0.2342	-0.2014
2007		0.0605	0.0833	0.0383
2008		0.0858	0.0923	0.0796
2009		-0.0057	-0.0380	0.0269
10 Point	2000	0.1228	0.1239	0.1214
	2001	-0.1014	-0.1082	-0.0948
	2002	0.0531	0.0378	0.0681
	2003	-0.0775	-0.0847	-0.0701
	2004	0.0273	0.0699	-0.0149
	2005	0.0151	0.0234	0.0073
	2006	-0.2230	-0.2389	-0.2063
	2007	0.0707	0.0933	0.0488
	2008	0.1133	0.1190	0.1079
	2009	0.0413	0.0075	0.0757