

PENNSYLVANIA COMPENSATION RATING BUREAU

Tail Factors and Paid Bridge Factors for Loss Development

For a given calendar year, the PCRБ collects financial loss development data for the current policy year and the thirty previous individual policy years. A single aggregate line of experience is reported for all older policy years combined.

A summary of both the incurred and paid 20th to ultimate tail factors is shown on Page 1.

The incurred tail factor methodology is applied separately for indemnity and medical loss experience using two separate methods. These two methods, which are described below, are averaged to generate the selected tail factors.

The first method, the historical Linear Decay method, is outlined below.

1. A starting policy year loss amount based on the average reported incurred loss for the three earliest available policy years was computed.
2. An annual loss inflation factor was selected based on observed changes in incurred losses by policy year for the older policy years having separate experience data reported.
3. A historical series of estimated incurred losses by policy year beginning with the policy year immediately prior to the earliest available policy year was computed using the starting point from #1 and the selected inflation factor from #2.
4. A calendar year loss development factor was selected for that policy year based on observed developments for the oldest years with actual separate experience available.
5. A rate of decline in calendar year loss development factors by policy year was then computed such that when the resulting series of loss development factors was applied to the historical series of estimated incurred losses in #3, the total implied dollar amount of loss development for the calendar year balanced to the observed amount of development on policy years prior to the earliest available policy year.
6. The tail factor applicable to maturities in those prior policy years based on that calendar year of experience was then computed as the cumulative product of the series of loss development factors constructed in #5 as well as the actual loss development factors from the 20th to 30th development periods to calculate a 20th to ultimate incurred tail factor.

Recognizing the volatility of observed calendar year development for the prior policy years in the aggregate, the PCRB elected to use an experience period comprising seven calendar years of loss development in computing indicated tail factors for this method.

A summary exhibit on Page 2 presents results of the Linear Decay tail development factor calculations. On Pages 3 through 16, fourteen exhibits presenting the derivation of indicated tail factors using the procedure outlined above are attached (seven for indemnity and seven for medical).

The second method, the Weibull curve fit method, is a commonly used distribution for fitting Workers Compensation data. Several Weibull models were generated and reviewed using various data points and calendar years to fit the data to project the 20th to ultimate incurred tail factor. A Weibull fit was selected for indemnity and medical from the various models generated. The model selections for indemnity and medical were considered separately to contemplate their unique characteristics relating to model fit, the stability of the data points and consistency of the development patterns before and after the tail attachment point. The detail of each of the selected Weibull models is shown on Page 17.

Pages 18 (indemnity) and 19 (medical) show the selected curves for the twentieth-to-ultimate bridge factors and the development periods used to select the curve. The average of the fitted factors from 20-21 to 50th-Ultimate was selected for both indemnity and medical. The 50th point was selected as the cutoff as the data shows that is the point where virtually all claims have been historically settled.

Page 20 shows graphically the two selected curve fits, and the resulting bridge factors based on the average of the points between the 20th and 50th reports.

PA Incurred Tail Factor Summary (20th to Ultimate)

(1) Incurred Tail Selections using Linear Decay Method (Pages 2 through 16)

Indemnity	1.0087	Medical	1.0406
Based on:		Based on:	
Average	7-Year	Average	7-Year
Data Points Used	20-29	Data Points Used	20-29

(2) Incurred Tail Selections using Weibull (Page 17)

Indemnity	1.0095	Medical	1.0263
Based on:		Based on:	
Average	5 year	Average	5-Year
Data Points Used	10-29	Data Points Used	10-29

(3) Incurred Tail Selections using a 50/50 Weight Between (1) and (2)

Indemnity	<input type="text" value="1.0091"/>	Medical	<input type="text" value="1.0335"/>
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(4) Paid to Incurred Bridge Factors (Pages 18 and 19)

Indemnity	1.0086	Medical	1.0366
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(5) Paid Tail Selections ((3) * (4))

Indemnity	<input type="text" value="1.0178"/>	Medical	<input type="text" value="1.0713"/>
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SUMMARY OF TAIL FACTOR CALCULATIONS USING LINEAR DECAY METHOD

VALUATION	MATURITY	INDEMNITY	MEDICAL
		Tail Factor	Tail Factor
21V22	20TH TO ULT.	1.0394	1.0390
20V21	20TH TO ULT.	1.0041	1.0040
19V20	20TH TO ULT.	1.0042	1.0519
18V19	20TH TO ULT.	1.0051	1.0182
17V18	20TH TO ULT.	1.0027	1.0701
16V17	20TH TO ULT.	1.0017	1.0474
15V16	20TH TO ULT.	1.0038	1.0534
AVERAGE OF LATEST 7 VALUATIONS		1.0087	1.0406

INDEMNITY 21 vs 22

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1991 PYs Incurred	10,036,228,947	1 PY 1990 Incurred = (Average of 1991, 1992, 1993) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1991 PYs Incurred	10,018,238,574	2 PY 1989 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1991 PYs	17,990,373	3 PY 1990 LDF selected based on balancing Prior to 1991 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1991 Incurred	810,527,515	4 PY 1989 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1991 PYs in Prior to 1991 PYs Data	12.38	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1991 PYs: 17,990,373
Selected Average PY Deflation Factor	0.95	Total Dollar Development: 17,990,373
		Difference: 0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	
1951	*	84,500,117	1.000000	7	1.0000	1987	*	535,559,242	1.002501	1,336,118	1.0100	34TH TO ULT
1952	*	88,947,491	1.000000	9	1.0000	1988	*	563,746,570	1.003335	1,873,695	1.0134	33RD TO ULT
1953	*	93,628,938	1.000000	13	1.0000	1989	*	593,417,443	1.004446	2,626,838	1.0179	32ND TO ULT
1954	*	98,556,777	1.000000	19	1.0000	1990	*	624,649,940	1.005928	3,681,358	1.0240	31ST TO ULT
1955	*	103,743,976	1.000000	26	1.0000	1991	*	657,526,252	1.00790455	5,156,688	1.0320	30TH TO ULT
1956	*	109,204,185	1.000000	37	1.0000	1992		811,812,062	1.0016		1.0337	29th TO ULT
1957	*	114,951,774	1.000000	51	1.0000	1993		711,454,298	1.0003		1.0340	28th TO ULT
1958	*	121,001,867	1.000001	72	1.0000	1994		662,416,472	1.0016		1.0357	27th TO ULT
1959	*	127,370,386	1.000001	101	1.0000	1995		556,345,225	1.0025		1.0383	26th TO ULT
1960	*	134,074,091	1.000001	142	1.0000	1996		469,576,967	1.0016		1.0399	25th TO ULT
1961	*	141,130,622	1.000001	199	1.0000	1997		485,617,066	0.9998		1.0397	24th TO ULT
1962	*	148,558,549	1.000002	280	1.0000	1998		474,472,046	0.9990		1.0387	23rd TO ULT
1963	*	156,377,421	1.000003	392	1.0000	1999		532,724,113	1.0009		1.0396	22nd TO ULT
1964	*	164,607,811	1.000003	551	1.0000	2000		566,722,292	0.9989		1.0385	21st TO ULT
1965	*	173,271,380	1.000004	773	1.0000	2001		597,510,502	1.0009		1.0394	20th TO ULT
1966	*	182,390,926	1.000006	1,085	1.0000	2002		647,682,165	0.9999			
1967	*	191,990,449	1.000008	1,523	1.0000	2003		641,564,736	1.0002			
1968	*	202,095,209	1.000011	2,137	1.0000	2004		687,231,537	1.0020			
1969	*	212,731,799	1.000014	3,000	1.0001	2005		700,076,098	1.0005			
1970	*	223,928,210	1.000019	4,210	1.0001	2006		723,784,742	1.0011			
1971	*	235,713,905	1.000025	5,908	1.0001	2007		762,475,810	1.0008			
1972	*	248,119,900	1.000033	8,293	1.0001	2008		709,495,946	1.0013			
1973	*	261,178,842	1.000045	11,639	1.0002	2009		648,432,602	0.9999			
1974	*	274,925,097	1.000059	16,335	1.0002	2010		671,279,508	1.0015			
1975	*	289,394,839	1.000079	22,925	1.0003	2011		653,501,328	1.0028			
1976	*	304,626,146	1.000106	32,175	1.0004	2012		608,486,804	1.0028			
1977	*	320,659,101	1.000141	45,156	1.0006	2013		617,061,015	0.9996			
1978	*	337,535,896	1.000188	63,374	1.0008	2014		622,256,346	1.0021			
1979	*	355,300,943	1.000250	88,941	1.0010	2015		591,122,778	1.0006			
1980	*	374,000,993	1.000334	124,818	1.0013	2016		549,138,852	0.9978			
1981	*	393,685,256	1.000445	175,164	1.0018	2017		580,644,175	1.0017			
1982	*	414,405,532	1.000594	245,808	1.0024	2018		601,436,031	1.0182			
1983	*	436,216,350	1.000791	344,926	1.0032	2019		550,835,502	1.0618			
1984	*	459,175,105	1.001055	483,979	1.0042	2020		478,992,144	1.3556			
1985	*	483,342,216	1.001407	679,030	1.0056	2021		373,378,549	3.1989			
1986	*	508,781,280	1.001876	952,578	1.0075	2022		118,469,614				

MEDICAL 21 vs 22

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1991 PYs Incurred	4,768,006,068	1 PY 1990 Incurred = (Average of 1991, 1992, 1993) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1991 PYs Incurred	4,771,410,883	2 PY 1989 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1991 PYs	-3,404,815	3 PY 1990 LDF selected based on balancing Prior to 1991 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1991 Incurred	520,895,036	4 PY 1989 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1991 PYs in Prior to 1991 PYs Data	9.15	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1991 PYs: -3,404,815
Selected Average PY Deflation Factor	0.93	Total Dollar Development: -3,404,812
		Difference: -3

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	
1951	*	20,935,789	1.000000	-1	1.0000	1987	*	285,432,340	0.999147	-243,569	0.9966	34TH TO ULT
1952	*	22,511,601	1.000000	-1	1.0000	1988	*	306,916,495	0.998863	-349,303	0.9955	33RD TO ULT
1953	*	24,206,022	1.000000	-1	1.0000	1989	*	330,017,737	0.998484	-500,982	0.9940	32ND TO ULT
1954	*	26,027,981	1.000000	-2	1.0000	1990	*	354,857,781	0.997979	-718,618	0.9919	31ST TO ULT
1955	*	27,987,076	1.000000	-2	1.0000	1991	*	381,567,507	0.99730534	-1,030,972	0.9893	30TH TO ULT
1956	*	30,093,630	1.000000	-3	1.0000	1992		522,907,427	1.0070		0.9962	29th TO ULT
1957	*	32,358,742	1.000000	-5	1.0000	1993		410,436,476	1.0310		1.0271	28th TO ULT
1958	*	34,794,347	1.000000	-7	1.0000	1994		390,164,619	1.0091		1.0364	27th TO ULT
1959	*	37,413,276	1.000000	-10	1.0000	1995		352,775,111	1.0049		1.0415	26th TO ULT
1960	*	40,229,329	1.000000	-15	1.0000	1996		344,006,628	0.9941		1.0354	25th TO ULT
1961	*	43,257,343	1.000000	-21	1.0000	1997		372,355,576	0.9993		1.0346	24th TO ULT
1962	*	46,513,272	0.999999	-30	1.0000	1998		387,368,100	1.0002		1.0348	23rd TO ULT
1963	*	50,014,271	0.999999	-43	1.0000	1999		409,977,726	1.0028		1.0377	22nd TO ULT
1964	*	53,778,786	0.999999	-61	1.0000	2000		442,857,680	1.0020		1.0398	21st TO ULT
1965	*	57,826,652	0.999998	-88	1.0000	2001		441,813,146	0.9992		1.0390	20th TO ULT
1966	*	62,179,195	0.999998	-126	1.0000	2002		528,371,908	1.0151			
1967	*	66,859,350	0.999997	-181	1.0000	2003		545,763,216	1.0075			
1968	*	71,891,774	0.999996	-259	1.0000	2004		602,395,682	1.0094			
1969	*	77,302,983	0.999995	-372	1.0000	2005		640,732,533	1.0070			
1970	*	83,121,487	0.999994	-533	1.0000	2006		654,271,086	1.0054			
1971	*	89,377,943	0.999991	-764	1.0000	2007		696,779,776	1.0069			
1972	*	96,105,315	0.999989	-1,095	1.0000	2008		626,989,150	1.0064			
1973	*	103,339,048	0.999985	-1,570	0.9999	2009		549,287,113	1.0002			
1974	*	111,117,256	0.999980	-2,251	0.9999	2010		605,156,947	1.0010			
1975	*	119,480,921	0.999973	-3,227	0.9999	2011		616,346,208	0.9970			
1976	*	128,474,109	0.999964	-4,627	0.9999	2012		583,785,092	0.9957			
1977	*	138,144,203	0.999952	-6,633	0.9998	2013		595,009,386	1.0070			
1978	*	148,542,153	0.999936	-9,510	0.9997	2014		607,401,250	0.9977			
1979	*	159,722,746	0.999915	-13,635	0.9997	2015		557,597,326	0.9972			
1980	*	171,744,888	0.999886	-19,548	0.9995	2016		537,659,321	0.9979			
1981	*	184,671,922	0.999848	-28,027	0.9994	2017		570,033,265	0.9959			
1982	*	198,571,960	0.999798	-40,185	0.9992	2018		651,733,160	1.0091			
1983	*	213,518,236	0.999730	-57,616	0.9989	2019		558,731,709	1.0013			
1984	*	229,589,501	0.999640	-82,612	0.9986	2020		510,528,083	1.0310			
1985	*	246,870,431	0.999520	-118,454	0.9981	2021		516,997,165	2.1780			
1986	*	265,452,077	0.999361	-169,853	0.9974	2022		255,413,205				

INDEMNITY 20 vs 21

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1991 PYs Incurred	9,054,842,360
Next Latest 12/31 Prior to 1991 PYs Incurred	9,051,304,630
CY Development of Prior to 1991 PYs	3,537,730
Next Latest PY 1991 Incurred	968,256,705
# of 1991 PYs in Prior to 1991 PYs Data	9.35
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 PY 1990 Incurred = (Average of 1991, 1992, 1993) x (PY Deflation Factor ^ 2)
- 2 PY 1989 & Prior Incurred = Subsequent Year x PY Deflation
- 3 PY 1990 LDF selected based on balancing Prior to 1991 PYs Total Dollar Dev. to Actual CY Dev.
- 4 PY 1989 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0

CY Development of Prior to 1991 PYs:	3,537,730
Total Dollar Development:	3,537,730
Difference:	0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	
1950	*	96,150,371	1.000000	1	1.0000	1986	*	609,398,207	1.000430	262,229	1.0017	34TH TO ULT
1951	*	101,210,916	1.000000	2	1.0000	1987	*	641,471,797	1.000574	367,987	1.0023	33RD TO ULT
1952	*	106,537,807	1.000000	3	1.0000	1988	*	675,233,471	1.000765	516,375	1.0031	32ND TO ULT
1953	*	112,145,060	1.000000	4	1.0000	1989	*	710,772,074	1.001020	724,552	1.0041	31ST TO ULT
1954	*	118,047,431	1.000000	5	1.0000	1990	*	748,181,131	1.00136057	1,016,570	1.0055	30TH TO ULT
1955	*	124,260,454	1.000000	7	1.0000	1991		968,620,534	1.0005		1.0060	29th TO ULT
1956	*	130,800,478	1.000000	10	1.0000	1992		810,527,515	1.0011		1.0071	28th TO ULT
1957	*	137,684,714	1.000000	14	1.0000	1993		707,880,642	0.9999		1.0070	27th TO ULT
1958	*	144,931,278	1.000000	20	1.0000	1994		659,757,553	1.0005		1.0075	26th TO ULT
1959	*	152,559,239	1.000000	28	1.0000	1995		554,452,741	1.0001		1.0076	25th TO ULT
1960	*	160,588,673	1.000000	39	1.0000	1996		467,654,765	1.0004		1.0080	24th TO ULT
1961	*	169,040,709	1.000000	55	1.0000	1997		483,999,903	0.9992		1.0072	23rd TO ULT
1962	*	177,937,588	1.000000	77	1.0000	1998		473,952,317	0.9983		1.0055	22nd TO ULT
1963	*	187,302,724	1.000001	108	1.0000	1999		530,943,909	0.9994		1.0048	21st TO ULT
1964	*	197,160,762	1.000001	151	1.0000	2000		566,628,559	0.9993		1.0041	20th TO ULT
1965	*	207,537,645	1.000001	212	1.0000	2001		597,308,892	1.0003			
1966	*	218,460,678	1.000001	298	1.0000	2002		647,791,336	0.9996			
1967	*	229,958,609	1.000002	419	1.0000	2003		640,675,294	1.0005			
1968	*	242,061,694	1.000002	587	1.0000	2004		683,325,200	0.9993			
1969	*	254,801,783	1.000003	825	1.0000	2005		696,901,597	1.0011			
1970	*	268,212,403	1.000004	1,157	1.0000	2006		722,246,187	0.9986			
1971	*	282,328,845	1.000006	1,624	1.0000	2007		762,078,733	0.9996			
1972	*	297,188,258	1.000008	2,280	1.0000	2008		702,105,116	1.0014			
1973	*	312,829,745	1.000010	3,199	1.0000	2009		642,453,072	1.0036			
1974	*	329,294,469	1.000014	4,490	1.0001	2010		662,268,285	1.0024			
1975	*	346,625,757	1.000018	6,302	1.0001	2011		637,591,012	1.0009			
1976	*	364,869,217	1.000024	8,845	1.0001	2012		585,741,740	0.9973			
1977	*	384,072,860	1.000032	12,414	1.0001	2013		591,057,335	1.0021			
1978	*	404,287,222	1.000043	17,423	1.0002	2014		593,552,657	1.0057			
1979	*	425,565,496	1.000057	24,453	1.0002	2015		564,082,013	1.0116			
1980	*	447,963,680	1.000077	34,320	1.0003	2016		530,873,832	0.9999			
1981	*	471,540,716	1.000102	48,167	1.0004	2017		570,263,838	1.0119			
1982	*	496,358,649	1.000136	67,600	1.0005	2018		585,718,800	1.0575			
1983	*	522,482,788	1.000182	94,873	1.0007	2019		516,199,734	1.3140			
1984	*	549,981,882	1.000242	133,147	1.0010	2020		350,905,834	3.4510			
1985	*	578,928,297	1.000323	186,858	1.0013	2021		115,363,166				

MEDICAL 20 vs 21

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1991 PYs Incurred	4,195,386,622
Next Latest 12/31 Prior to 1991 PYs Incurred	4,196,921,440
CY Development of Prior to 1991 PYs	-1,534,818
Next Latest PY 1991 Incurred	586,930,824
# of 1991 PYs in Prior to 1991 PYs Data	7.15
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.93

1 PY 1990 Incurred = (Average of 1991, 1992, 1993) x (PY Deflation Factor ^ 2)	
2 PY 1989 & Prior Incurred = Subsequent Year x PY Deflation	
3 PY 1990 LDF selected based on balancing Prior to 1991 PYs Total Dollar Dev. to Actual CY Dev.	
4 PY 1989 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0	
CY Development of Prior to 1991 PYs:	-1,534,818
Total Dollar Development:	-1,534,818
Difference:	0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/21	Prior Year LDF	Dollar Development	Cumulative LDF	
1950	*	23,813,960	1.000000	0	1.0000	1986	*	324,672,479	0.999662	-109,853	0.9986	34TH TO ULT
1951	*	25,606,409	1.000000	0	1.0000	1987	*	349,110,192	0.999549	-157,513	0.9982	33RD TO ULT
1952	*	27,533,773	1.000000	-1	1.0000	1988	*	375,387,304	0.999399	-225,859	0.9976	32ND TO ULT
1953	*	29,606,208	1.000000	-1	1.0000	1989	*	403,642,262	0.999198	-323,877	0.9968	31ST TO ULT
1954	*	31,834,632	1.000000	-1	1.0000	1990	*	434,023,937	0.99893101	-464,464	0.9957	30TH TO ULT
1955	*	34,230,787	1.000000	-2	1.0000	1991		586,193,142	1		0.9947	29th TO ULT
1956	*	36,807,298	1.000000	-2	1.0000	1992		520,895,036	1		0.9966	28th TO ULT
1957	*	39,577,739	1.000000	-3	1.0000	1993		398,371,196	1		1.0009	27th TO ULT
1958	*	42,556,709	1.000000	-5	1.0000	1994		387,416,163	1		1.0016	26th TO ULT
1959	*	45,759,902	1.000000	-7	1.0000	1995		349,746,066	1		1.0003	25th TO ULT
1960	*	49,204,196	1.000000	-9	1.0000	1996		346,779,470	1		1.0013	24th TO ULT
1961	*	52,907,738	1.000000	-13	1.0000	1997		372,051,141	1		1.0076	23rd TO ULT
1962	*	56,890,040	1.000000	-19	1.0000	1998		386,731,222	1		1.0094	22nd TO ULT
1963	*	61,172,086	1.000000	-28	1.0000	1999		408,798,734	1		1.0048	21st TO ULT
1964	*	65,776,437	0.999999	-40	1.0000	2000		442,032,895	1		1.0040	20th TO ULT
1965	*	70,727,352	0.999999	-57	1.0000	2001		442,252,994	1			
1966	*	76,050,916	0.999999	-82	1.0000	2002		526,330,023	1			
1967	*	81,775,178	0.999999	-117	1.0000	2003		544,904,495	1			
1968	*	87,930,299	0.999998	-168	1.0000	2004		597,998,160	1			
1969	*	94,548,709	0.999997	-240	1.0000	2005		639,258,632	1			
1970	*	101,665,278	0.999997	-345	1.0000	2006		653,802,391	1			
1971	*	109,317,504	0.999995	-494	1.0000	2007		693,791,742	1			
1972	*	117,545,703	0.999994	-708	1.0000	2008		619,763,094	1			
1973	*	126,393,229	0.999992	-1,016	1.0000	2009		543,798,434	1			
1974	*	135,906,698	0.999989	-1,456	1.0000	2010		596,374,931	1			
1975	*	146,136,234	0.999986	-2,088	0.9999	2011		608,296,506	1			
1976	*	157,135,735	0.999981	-2,993	0.9999	2012		565,446,077	1			
1977	*	168,963,156	0.999975	-4,291	0.9999	2013		566,324,009	1			
1978	*	181,680,813	0.999966	-6,152	0.9999	2014		584,414,471	1			
1979	*	195,355,713	0.999955	-8,820	0.9998	2015		535,418,255	1			
1980	*	210,059,907	0.999940	-12,646	0.9998	2016		520,559,141	1			
1981	*	225,870,867	0.999920	-18,131	0.9997	2017		564,017,812	1			
1982	*	242,871,900	0.999893	-25,995	0.9996	2018		641,248,891	1			
1983	*	261,152,581	0.999857	-37,270	0.9994	2019		555,117,919	1			
1984	*	280,809,227	0.999810	-53,436	0.9992	2020		493,387,035	2			
1985	*	301,945,405	0.999746	-76,616	0.9990	2021		235,711,188				

INDEMNITY 19 vs 20

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1990 PYs Incurred	8,188,692,883
Next Latest 12/31 Prior to 1990 PYs Incurred	8,186,858,932
CY Development of Prior to 1990 PYs	1,833,951
Next Latest PY 1990 Incurred	1,153,845,876
# of 1990 PYs in Prior to 1990 PYs Data	7.10
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.95

1 PY 1989 Incurred = (Average of 1990, 1991, 1992) x (PY Deflation Factor ^ 2)	
2 PY 1988 & Prior Incurred = Subsequent Year x PY Deflation	
3 PY 1989 LDF selected based on balancing Prior to 1990 PYs Total Dollar Dev. to Actual CY Dev.	
4 PY 1988 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0	
CY Development of Prior to 1990 PYs:	1,833,951
Total Dollar Development:	1,833,949
Difference:	2

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/20	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/20	Prior Year LDF	Dollar Development	Cumulative LDF	
1949	*	115,759,869	1.000000	1	1.0000	1985	*	733,682,629	1.000185	135,907	1.0007	34TH TO ULT
1950	*	121,852,494	1.000000	1	1.0000	1986	*	772,297,504	1.000247	190,735	1.0010	33RD TO ULT
1951	*	128,265,783	1.000000	1	1.0000	1987	*	812,944,742	1.000329	267,676	1.0013	32ND TO ULT
1952	*	135,016,614	1.000000	2	1.0000	1988	*	855,731,307	1.000439	375,644	1.0018	31ST TO ULT
1953	*	142,122,751	1.000000	3	1.0000	1989	*	900,769,797	1.00058556	527,143	1.0023	30TH TO ULT
1954	*	149,602,896	1.000000	4	1.0000	1990		1,153,984,370	1.0001		1.0024	29th TO ULT
1955	*	157,476,733	1.000000	5	1.0000	1991		998,952,964	0.9997		1.0021	28th TO ULT
1956	*	165,764,982	1.000000	7	1.0000	1992		841,311,297	1.0007		1.0028	27th TO ULT
1957	*	174,489,454	1.000000	10	1.0000	1993		727,642,487	1.0002		1.0030	26th TO ULT
1958	*	183,673,110	1.000000	14	1.0000	1994		677,118,189	1.0004		1.0034	25th TO ULT
1959	*	193,340,116	1.000000	20	1.0000	1995		571,364,425	1.0002		1.0036	24th TO ULT
1960	*	203,515,911	1.000000	28	1.0000	1996		484,875,000	0.9988		1.0024	23rd TO ULT
1961	*	214,227,275	1.000000	40	1.0000	1997		502,559,542	1.0005		1.0029	22nd TO ULT
1962	*	225,502,395	1.000000	56	1.0000	1998		501,588,967	1.0006		1.0035	21st TO ULT
1963	*	237,370,942	1.000000	78	1.0000	1999		567,949,444	1.0007		1.0042	20th TO ULT
1964	*	249,864,149	1.000000	110	1.0000	2000		605,953,195	1.0002			
1965	*	263,014,894	1.000001	155	1.0000	2001		615,864,862	0.9998			
1966	*	276,857,783	1.000001	217	1.0000	2002		651,024,254	0.9998			
1967	*	291,429,246	1.000001	304	1.0000	2003		640,947,054	0.9985			
1968	*	306,767,627	1.000001	427	1.0000	2004		685,548,320	0.9988			
1969	*	322,913,291	1.000002	600	1.0000	2005		698,159,011	1.0003			
1970	*	339,908,728	1.000002	842	1.0000	2006		724,743,675	1.0011			
1971	*	357,798,661	1.000003	1,181	1.0000	2007		763,127,378	1.0019			
1972	*	376,630,169	1.000004	1,658	1.0000	2008		705,628,871	1.0006			
1973	*	396,452,810	1.000006	2,327	1.0000	2009		643,208,438	1.0003			
1974	*	417,318,747	1.000008	3,266	1.0000	2010		664,238,426	1.0009			
1975	*	439,282,892	1.000010	4,583	1.0000	2011		639,644,488	1.0006			
1976	*	462,403,044	1.000014	6,432	1.0001	2012		591,276,650	1.0026			
1977	*	486,740,046	1.000019	9,028	1.0001	2013		591,490,618	1.0008			
1978	*	512,357,943	1.000025	12,671	1.0001	2014		589,833,631	1.0012			
1979	*	539,324,151	1.000033	17,783	1.0001	2015		557,562,077	0.9999			
1980	*	567,709,633	1.000044	24,959	1.0002	2016		531,835,823	1.0091			
1981	*	597,589,087	1.000059	35,030	1.0002	2017		564,388,149	1.0708			
1982	*	629,041,144	1.000078	49,163	1.0003	2018		556,512,301	1.3172			
1983	*	662,148,573	1.000104	69,000	1.0004	2019		393,672,641	3.1258			
1984	*	696,998,498	1.000139	96,838	1.0006	2020		98,937,045				

MEDICAL 19 vs 20

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1990 PYs Incurred	3,674,223,609
Next Latest 12/31 Prior to 1990 PYs Incurred	3,661,430,307
CY Development of Prior to 1990 PYs	12,793,302
Next Latest PY 1990 Incurred	655,239,059
# of 1990 PYs in Prior to 1990 PYs Data	5.61
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 PY 1989 Incurred = (Average of 1990, 1991, 1992) x (PY Deflation Factor ^ 2)
- 2 PY 1988 & Prior Incurred = Subsequent Year x PY Deflation
- 3 PY 1989 LDF selected based on balancing Prior to 1990 PYs Total Dollar Dev. to Actual CY Dev.
- 4 PY 1988 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0

CY Development of Prior to 1990 PYs:	12,793,302
Total Dollar Development:	12,793,302
Difference:	0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/20	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/20	Prior Year LDF	Dollar Development	Cumulative LDF	
1949	*	28,484,126	1.000000	2	1.0000	1985	*	388,344,130	1.002370	918,149	1.0095	34TH TO ULT
1950	*	30,628,092	1.000000	3	1.0000	1986	*	417,574,334	1.003160	1,315,306	1.0127	33RD TO ULT
1951	*	32,933,432	1.000000	4	1.0000	1987	*	449,004,660	1.004213	1,883,766	1.0170	32ND TO ULT
1952	*	35,412,293	1.000000	6	1.0000	1988	*	482,800,709	1.005617	2,696,968	1.0227	31ST TO ULT
1953	*	38,077,734	1.000000	9	1.0000	1989	*	519,140,548	1.00748996	3,859,434	1.0303	30TH TO ULT
1954	*	40,943,800	1.000000	13	1.0000	1990		656,282,963	1.0016		1.0320	29th TO ULT
1955	*	44,025,592	1.000000	19	1.0000	1991		606,608,629	1.0000		1.0320	28th TO ULT
1956	*	47,339,346	1.000001	27	1.0000	1992		537,804,030	1.0078		1.0400	27th TO ULT
1957	*	50,902,523	1.000001	38	1.0000	1993		409,477,667	1.0012		1.0413	26th TO ULT
1958	*	54,733,895	1.000001	55	1.0000	1994		396,693,314	1.0004		1.0417	25th TO ULT
1959	*	58,853,651	1.000001	79	1.0000	1995		360,841,664	1.0015		1.0433	24th TO ULT
1960	*	63,283,495	1.000002	113	1.0000	1996		357,198,604	1.0002		1.0435	23rd TO ULT
1961	*	68,046,769	1.000002	162	1.0000	1997		381,831,478	1.0095		1.0534	22nd TO ULT
1962	*	73,168,569	1.000003	232	1.0000	1998		411,290,211	0.9988		1.0521	21st TO ULT
1963	*	78,675,881	1.000004	333	1.0000	1999		432,576,208	0.9998		1.0519	20th TO ULT
1964	*	84,597,721	1.000006	477	1.0000	2000		467,049,528	1.0057			
1965	*	90,965,292	1.000008	684	1.0000	2001		456,420,558	0.9984			
1966	*	97,812,142	1.000010	980	1.0000	2002		527,180,241	0.9978			
1967	*	105,174,346	1.000013	1,405	1.0001	2003		545,284,487	1.0033			
1968	*	113,090,694	1.000018	2,015	1.0001	2004		600,479,655	0.9975			
1969	*	121,602,897	1.000024	2,888	1.0001	2005		639,185,194	1.0053			
1970	*	130,755,803	1.000032	4,141	1.0001	2006		652,282,075	1.0072			
1971	*	140,597,638	1.000042	5,937	1.0002	2007		693,081,995	1.0063			
1972	*	151,180,256	1.000056	8,511	1.0002	2008		623,927,873	1.0027			
1973	*	162,559,415	1.000075	12,202	1.0003	2009		547,740,676	0.9998			
1974	*	174,795,070	1.000100	17,494	1.0004	2010		602,124,739	1.0028			
1975	*	187,951,688	1.000133	25,080	1.0005	2011		607,773,636	1.0064			
1976	*	202,098,589	1.000178	35,955	1.0007	2012		563,567,228	0.9996			
1977	*	217,310,311	1.000237	51,546	1.0009	2013		562,739,330	1.0012			
1978	*	233,667,001	1.000316	73,895	1.0013	2014		581,990,601	1.0001			
1979	*	251,254,840	1.000422	105,931	1.0017	2015		532,025,356	0.9919			
1980	*	270,166,495	1.000562	151,851	1.0023	2016		526,116,923	1.0007			
1981	*	290,501,607	1.000750	217,667	1.0030	2017		573,524,506	1.0169			
1982	*	312,367,320	1.001000	311,989	1.0040	2018		642,190,878	1.0194			
1983	*	335,878,838	1.001333	447,148	1.0053	2019		527,344,811	1.8255			
1984	*	361,160,041	1.001777	640,788	1.0071	2020		227,670,229				

INDEMNITY 18 vs 19

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1989 PYs Incurred	7,330,112,987
Next Latest 12/31 Prior to 1989 PYs Incurred	7,328,022,613
CY Development of Prior to 1989 PYs	2,090,373
Next Latest PY 1989 Incurred	1,160,484,070
# of 1989 PYs in Prior to 1989 PYs Data	6.32
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.95

1 PY 1988 Incurred = (Average of 1989, 1990, 1991) x (PY Deflation Factor ^ 2)	
2 PY 1987 & Prior Incurred = Subsequent Year x PY Deflation	
3 PY 1988 LDF selected based on balancing Prior to 1989 PYs Total Dollar Dev. to Actual CY Dev.	
4 PY 1987 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0	
CY Development of Prior to 1989 PYs:	2,090,373
Total Dollar Development:	2,090,373
Difference:	0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/19	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/19	Prior Year LDF	Dollar Development	Cumulative LDF	
1948	*	130,392,720	1.000000	1	1.0000	1984	*	826,425,206	1.000187	154,910	1.0008	34TH TO ULT
1949	*	137,255,495	1.000000	1	1.0000	1985	*	869,921,270	1.000250	217,404	1.0010	33RD TO ULT
1950	*	144,479,468	1.000000	2	1.0000	1986	*	915,706,600	1.000333	305,103	1.0013	32ND TO ULT
1951	*	152,083,651	1.000000	2	1.0000	1987	*	963,901,684	1.000444	428,167	1.0018	31ST TO ULT
1952	*	160,088,053	1.000000	3	1.0000	1988	*	1,014,633,351	1.00059253	600,847	1.0024	30TH TO ULT
1953	*	168,513,741	1.000000	4	1.0000	1989		1,160,217,751	0.9998		1.0022	29th TO ULT
1954	*	177,382,885	1.000000	6	1.0000	1990		1,185,020,691	0.9992		1.0014	28th TO ULT
1955	*	186,718,826	1.000000	8	1.0000	1991		1,027,504,000	0.9995		1.0009	27th TO ULT
1956	*	196,546,133	1.000000	12	1.0000	1992		873,784,851	1.0031		1.0040	26th TO ULT
1957	*	206,890,666	1.000000	16	1.0000	1993		757,599,518	1.0002		1.0042	25th TO ULT
1958	*	217,779,648	1.000000	23	1.0000	1994		700,530,084	0.9990		1.0032	24th TO ULT
1959	*	229,241,735	1.000000	32	1.0000	1995		596,445,615	1.0003		1.0035	23rd TO ULT
1960	*	241,307,090	1.000000	45	1.0000	1996		513,054,683	0.9995		1.0030	22nd TO ULT
1961	*	254,007,463	1.000000	64	1.0000	1997		522,470,276	1.0011		1.0041	21st TO ULT
1962	*	267,376,277	1.000000	89	1.0000	1998		522,902,930	1.0010		1.0051	20th TO ULT
1963	*	281,448,712	1.000000	125	1.0000	1999		595,466,700	0.9993			
1964	*	296,261,802	1.000001	176	1.0000	2000		632,588,483	1.0003			
1965	*	311,854,529	1.000001	247	1.0000	2001		642,913,117	1.0000			
1966	*	328,267,925	1.000001	347	1.0000	2002		675,522,266	0.9994			
1967	*	345,545,184	1.000001	487	1.0000	2003		658,911,343	0.9977			
1968	*	363,731,773	1.000002	683	1.0000	2004		695,371,586	1.0000			
1969	*	382,875,550	1.000003	959	1.0000	2005		700,395,648	0.9989			
1970	*	403,026,895	1.000003	1,346	1.0000	2006		723,087,503	1.0007			
1971	*	424,238,837	1.000004	1,890	1.0000	2007		759,664,929	0.9997			
1972	*	446,567,197	1.000006	2,652	1.0000	2008		708,143,423	0.9989			
1973	*	470,070,734	1.000008	3,722	1.0000	2009		645,506,480	1.0017			
1974	*	494,811,298	1.000011	5,224	1.0000	2010		667,707,858	1.0015			
1975	*	520,853,998	1.000014	7,332	1.0001	2011		642,784,847	1.0024			
1976	*	548,267,367	1.000019	10,290	1.0001	2012		590,303,169	1.0043			
1977	*	577,123,544	1.000025	14,443	1.0001	2013		585,095,892	0.9978			
1978	*	607,498,467	1.000033	20,270	1.0001	2014		583,671,438	1.0042			
1979	*	639,472,071	1.000044	28,449	1.0002	2015		559,977,690	1.0205			
1980	*	673,128,496	1.000059	39,928	1.0002	2016		529,212,396	1.0832			
1981	*	708,556,311	1.000079	56,038	1.0003	2017		530,102,279	1.3449			
1982	*	745,848,749	1.000105	78,647	1.0004	2018		422,417,885	3.5355			
1983	*	785,103,946	1.000141	110,379	1.0006	2019		126,048,403				

MEDICAL 18 vs 19

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1989 PYs Incurred	3,159,471,440
Next Latest 12/31 Prior to 1989 PYs Incurred	3,153,223,207
CY Development of Prior to 1989 PYs	6,248,233
Next Latest PY 1989 Incurred	655,473,249
# of 1989 PYs in Prior to 1989 PYs Data	4.82
Selected Decrement Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 PY 1988 Incurred = (Average of 1989, 1990, 1991) x (PY Deflation Factor ^ 2)
- 2 PY 1987 & Prior Incurred = Subsequent Year x PY Deflation
- 3 PY 1988 LDF selected based on balancing Prior to 1989 PYs Total Dollar Dev. to Actual CY Dev.
- 4 PY 1987 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0

CY Development of Prior to 1989 PYs:	6,248,233
Total Dollar Development:	6,248,234
Difference:	-1

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/19	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/19	Prior Year LDF	Dollar Development	Cumulative LDF	
1948	*	30,994,713	1.000000	1	1.0000	1984	*	422,572,738	1.001061	447,839	1.0043	34TH TO ULT
1949	*	33,327,649	1.000000	1	1.0000	1985	*	454,379,288	1.001415	641,836	1.0057	33RD TO ULT
1950	*	35,836,181	1.000000	2	1.0000	1986	*	488,579,879	1.001886	919,762	1.0076	32ND TO ULT
1951	*	38,533,528	1.000000	3	1.0000	1987	*	525,354,709	1.002515	1,317,828	1.0101	31ST TO ULT
1952	*	41,433,901	1.000000	4	1.0000	1988	*	564,897,537	1.00335302	1,887,781	1.0135	30TH TO ULT
1953	*	44,552,582	1.000000	6	1.0000	1989		654,445,740	0.9984		1.0119	29th TO ULT
1954	*	47,906,002	1.000000	9	1.0000	1990		677,560,802	1.0026		1.0145	28th TO ULT
1955	*	51,511,831	1.000000	13	1.0000	1991		627,402,187	1.0023		1.0168	27th TO ULT
1956	*	55,389,065	1.000000	19	1.0000	1992		556,747,561	1.0064		1.0233	26th TO ULT
1957	*	59,558,134	1.000000	27	1.0000	1993		429,685,191	0.9988		1.0221	25th TO ULT
1958	*	64,041,005	1.000001	38	1.0000	1994		410,946,338	1.0023		1.0245	24th TO ULT
1959	*	68,861,296	1.000001	55	1.0000	1995		376,584,348	1.0008		1.0253	23rd TO ULT
1960	*	74,044,404	1.000001	79	1.0000	1996		375,255,756	0.9927		1.0178	22nd TO ULT
1961	*	79,617,638	1.000001	113	1.0000	1997		393,565,229	0.9983		1.0161	21st TO ULT
1962	*	85,610,364	1.000002	162	1.0000	1998		429,409,261	1.0021		1.0182	20th TO ULT
1963	*	92,054,155	1.000003	232	1.0000	1999		452,765,979	1.0021			
1964	*	98,982,962	1.000003	333	1.0000	2000		487,318,937	1.0025			
1965	*	106,433,293	1.000004	477	1.0000	2001		476,079,683	1.0010			
1966	*	114,444,401	1.000006	685	1.0000	2002		546,297,278	0.9973			
1967	*	123,058,495	1.000008	981	1.0000	2003		558,041,835	0.9998			
1968	*	132,320,963	1.000011	1,407	1.0000	2004		610,827,079	1.0004			
1969	*	142,280,605	1.000014	2,017	1.0001	2005		641,828,407	1.0065			
1970	*	152,989,898	1.000019	2,892	1.0001	2006		650,203,327	1.0010			
1971	*	164,505,267	1.000025	4,146	1.0001	2007		694,940,535	1.0007			
1972	*	176,887,383	1.000034	5,944	1.0001	2008		629,871,028	1.0021			
1973	*	190,201,488	1.000045	8,522	1.0002	2009		555,214,790	0.9996			
1974	*	204,517,729	1.000060	12,218	1.0002	2010		612,162,649	1.0026			
1975	*	219,911,536	1.000080	17,516	1.0003	2011		602,374,718	1.0041			
1976	*	236,464,017	1.000106	25,112	1.0004	2012		565,763,057	1.0138			
1977	*	254,262,384	1.000142	36,002	1.0006	2013		569,618,704	0.9946			
1978	*	273,400,413	1.000189	51,614	1.0008	2014		575,317,663	0.9945			
1979	*	293,978,939	1.000252	73,994	1.0010	2015		539,012,376	1.0018			
1980	*	316,106,386	1.000336	106,075	1.0013	2016		524,482,623	1.0136			
1981	*	339,899,340	1.000448	152,062	1.0018	2017		575,245,203	1.0451			
1982	*	365,483,161	1.000597	217,977	1.0024	2018		628,770,837	2.1572			
1983	*	392,992,646	1.000796	312,450	1.0032	2019		290,459,584				

INDEMNITY 17 vs 18

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1988 PYs Incurred	6,303,711,141	1 PY 1987 Incurred = (Average of 1988, 1989, 1990) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1988 PYs Incurred	6,304,174,763	2 PY 1986 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1988 PYs	-463,622	3 PY 1987 LDF selected based on balancing Prior to 1988 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1988 Incurred	994,707,604	4 PY 1986 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1988 PYs in Prior to 1988 PYs Data	6.34	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1988 PYs: -463,622
Selected Average PY Deflation Factor	0.95	Total Dollar Development: -463,622
		Difference: 0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/18	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/18	Prior Year LDF	Dollar Development	Cumulative LDF	
1947	*	129,126,361	1.000000	0	1.0000	1983	*	818,399,057	0.999958	-34,350	0.9998	34TH TO ULT
1948	*	135,922,485	1.000000	0	1.0000	1984	*	861,472,692	0.999944	-48,211	0.9998	33RD TO ULT
1949	*	143,076,300	1.000000	0	1.0000	1985	*	906,813,360	0.999925	-67,666	0.9997	32ND TO ULT
1950	*	150,606,631	1.000000	0	1.0000	1986	*	954,540,379	0.999901	-94,972	0.9996	31ST TO ULT
1951	*	158,533,296	1.000000	-1	1.0000	1987	*	1,004,779,346	0.99986735	-133,298	0.9995	30TH TO ULT
1952	*	166,877,154	1.000000	-1	1.0000	1988		994,106,481	0.9994		0.9989	29th TO ULT
1953	*	175,660,162	1.000000	-1	1.0000	1989		1,160,177,865	1.0002		0.9991	28th TO ULT
1954	*	184,905,434	1.000000	-2	1.0000	1990		1,185,702,400	1.0006		0.9997	27th TO ULT
1955	*	194,637,299	1.000000	-3	1.0000	1991		1,028,042,580	1.0004		1.0001	26th TO ULT
1956	*	204,881,367	1.000000	-4	1.0000	1992		871,251,371	1.0023		1.0024	25th TO ULT
1957	*	215,664,597	1.000000	-5	1.0000	1993		757,923,969	1.0000		1.0024	24th TO ULT
1958	*	227,015,365	1.000000	-7	1.0000	1994		701,921,392	0.9999		1.0023	23rd TO ULT
1959	*	238,963,542	1.000000	-10	1.0000	1995		596,366,407	1.0002		1.0025	22nd TO ULT
1960	*	251,540,571	1.000000	-14	1.0000	1996		513,368,363	0.9996		1.0021	21st TO ULT
1961	*	264,779,548	1.000000	-20	1.0000	1997		522,336,131	1.0006		1.0027	20th TO ULT
1962	*	278,715,314	1.000000	-28	1.0000	1998		522,907,154	1.0007			
1963	*	293,384,541	1.000000	-39	1.0000	1999		596,380,725	1.0009			
1964	*	308,825,833	1.000000	-55	1.0000	2000		632,717,334	1.0000			
1965	*	325,079,824	1.000000	-77	1.0000	2001		643,323,781	1.0009			
1966	*	342,189,288	1.000000	-108	1.0000	2002		675,956,444	1.0011			
1967	*	360,199,251	1.000000	-152	1.0000	2003		653,759,793	0.9992			
1968	*	379,157,106	0.999999	-213	1.0000	2004		683,860,179	1.0005			
1969	*	399,112,743	0.999999	-298	1.0000	2005		684,213,253	1.0020			
1970	*	420,118,677	0.999999	-419	1.0000	2006		707,864,330	1.0025			
1971	*	442,230,186	0.999999	-588	1.0000	2007		739,583,218	1.0022			
1972	*	465,505,459	0.999998	-825	1.0000	2008		691,742,383	0.9995			
1973	*	490,005,747	0.999998	-1,158	1.0000	2009		628,405,905	1.0029			
1974	*	515,795,523	0.999997	-1,625	1.0000	2010		646,714,296	1.0020			
1975	*	542,942,656	0.999996	-2,281	1.0000	2011		621,590,866	1.0000			
1976	*	571,518,585	0.999994	-3,202	1.0000	2012		570,018,890	1.0034			
1977	*	601,598,510	0.999993	-4,494	1.0000	2013		573,163,467	0.9976			
1978	*	633,261,590	0.999990	-6,307	1.0000	2014		570,064,841	1.0170			
1979	*	666,591,147	0.999987	-8,852	0.9999	2015		548,712,251	1.0791			
1980	*	701,674,892	0.999982	-12,424	0.9999	2016		488,551,343	1.3284			
1981	*	738,605,149	0.999976	-17,438	0.9999	2017		394,220,080	3.3940			
1982	*	777,479,104	0.999969	-24,474	0.9999	2018		119,495,366				

MEDICAL 17 vs 18

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1988 PYs Incurred	2,614,306,665	1 PY 1987 Incurred = (Average of 1988, 1989, 1990) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1988 PYs Incurred	2,598,041,698	2 PY 1986 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1988 PYs	16,264,967	3 PY 1987 LDF selected based on balancing Prior to 1988 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1988 Incurred	531,512,303	4 PY 1986 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1988 PYs in Prior to 1988 PYs Data	4.92	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1988 PYs: 16,264,967
Selected Average PY Deflation Factor	0.93	Total Dollar Development: 16,264,967
		Difference: 0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/18	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/18	Prior Year LDF	Dollar Development	Cumulative LDF	
1947	*	29,493,528	1.000000	3	1.0000	1983	*	402,106,023	1.002913	1,167,932	1.0117	34TH TO ULT
1948	*	31,713,471	1.000000	4	1.0000	1984	*	432,372,068	1.003884	1,672,836	1.0156	33RD TO ULT
1949	*	34,100,506	1.000000	6	1.0000	1985	*	464,916,202	1.005179	2,395,241	1.0209	32ND TO ULT
1950	*	36,667,211	1.000000	8	1.0000	1986	*	499,909,895	1.006905	3,428,151	1.0279	31ST TO ULT
1951	*	39,427,109	1.000000	12	1.0000	1987	*	537,537,521	1.00920652	4,903,702	1.0374	30TH TO ULT
1952	*	42,394,741	1.000000	17	1.0000	1988		533,169,876	1.0031		1.0406	29th TO ULT
1953	*	45,585,743	1.000001	24	1.0000	1989		655,442,233	1.0050		1.0458	28th TO ULT
1954	*	49,016,928	1.000001	34	1.0000	1990		675,895,422	1.0017		1.0476	27th TO ULT
1955	*	52,706,374	1.000001	49	1.0000	1991		626,111,547	1.0024		1.0501	26th TO ULT
1956	*	56,673,520	1.000001	70	1.0000	1992		553,309,205	1.0023		1.0525	25th TO ULT
1957	*	60,939,269	1.000002	100	1.0000	1993		430,468,373	0.9961		1.0484	24th TO ULT
1958	*	65,526,096	1.000002	144	1.0000	1994		410,498,121	1.0088		1.0577	23rd TO ULT
1959	*	70,458,168	1.000003	206	1.0000	1995		376,438,471	1.0046		1.0625	22nd TO ULT
1960	*	75,761,470	1.000004	295	1.0000	1996		378,070,875	1.0031		1.0658	21st TO ULT
1961	*	81,463,947	1.000005	423	1.0000	1997		394,997,939	1.0040		1.0701	20th TO ULT
1962	*	87,595,642	1.000007	607	1.0000	1998		428,762,410	1.0045			
1963	*	94,188,862	1.000009	870	1.0000	1999		452,101,414	1.0012			
1964	*	101,278,346	1.000012	1,247	1.0000	2000		486,596,378	1.0081			
1965	*	108,901,448	1.000016	1,788	1.0001	2001		475,812,863	1.0016			
1966	*	117,098,331	1.000022	2,564	1.0001	2002		547,746,192	1.0196			
1967	*	125,912,184	1.000029	3,676	1.0001	2003		552,415,916	1.0069			
1968	*	135,389,445	1.000039	5,270	1.0002	2004		604,026,665	1.0101			
1969	*	145,580,048	1.000052	7,556	1.0002	2005		624,663,654	1.0048			
1970	*	156,537,686	1.000069	10,832	1.0003	2006		639,077,350	1.0074			
1971	*	168,320,092	1.000092	15,530	1.0004	2007		679,396,727	1.0030			
1972	*	180,989,347	1.000123	22,265	1.0005	2008		613,725,788	1.0034			
1973	*	194,612,201	1.000164	31,919	1.0007	2009		541,854,119	0.9989			
1974	*	209,260,431	1.000219	45,760	1.0009	2010		595,291,755	1.0089			
1975	*	225,011,216	1.000292	65,601	1.0012	2011		583,087,922	1.0007			
1976	*	241,947,544	1.000389	94,042	1.0016	2012		543,742,256	1.0003			
1977	*	260,158,650	1.000518	134,810	1.0021	2013		561,898,894	0.9866			
1978	*	279,740,484	1.000691	193,242	1.0028	2014		568,597,852	1.0018			
1979	*	300,796,219	1.000922	276,986	1.0037	2015		538,049,539	0.9999			
1980	*	323,436,794	1.001229	396,991	1.0049	2016		517,512,602	1.0466			
1981	*	347,781,499	1.001639	568,929	1.0066	2017		550,490,869	2.1862			
1982	*	373,958,602	1.002185	815,225	1.0088	2018		291,707,133				

INDEMNITY 16 vs 17

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1987 PYs Incurred	5,287,930,388	1 PY 1986 Incurred = (Average of 1987, 1988, 1989) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1987 PYs Incurred	5,286,913,916	2 PY 1985 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1987 PYs	1,016,472	3 PY 1986 LDF selected based on balancing Prior to 1987 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1987 Incurred	868,247,305	4 PY 1985 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1987 PYs in Prior to 1987 PYs Data	6.09	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1987 PYs: 1,016,472
Selected Average PY Deflation Factor	0.95	Total Dollar Development: 1,016,472
		Difference: 0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/17	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/17	Prior Year LDF	Dollar Development	Cumulative LDF	
1946	*	115,674,653	1.000000	0	1.0000	1982	*	733,142,534	1.000103	75,321	1.0004	34TH TO ULT
1947	*	121,762,793	1.000000	1	1.0000	1983	*	771,728,983	1.000137	105,710	1.0005	33RD TO ULT
1948	*	128,171,361	1.000000	1	1.0000	1984	*	812,346,298	1.000183	148,358	1.0007	32ND TO ULT
1949	*	134,917,222	1.000000	1	1.0000	1985	*	855,101,367	1.000244	208,209	1.0010	31ST TO ULT
1950	*	142,018,129	1.000000	1	1.0000	1986	*	900,106,702	1.000325	292,199	1.0013	30TH TO ULT
1951	*	149,492,767	1.000000	2	1.0000	1987		868,590,440	1.0004		1.0017	29th TO ULT
1952	*	157,360,807	1.000000	3	1.0000	1988		980,512,306	0.9995		1.0012	28th TO ULT
1953	*	165,642,955	1.000000	4	1.0000	1989		1,142,941,692	1.0003		1.0015	27th TO ULT
1954	*	174,361,005	1.000000	6	1.0000	1990		1,165,153,522	1.0003		1.0018	26th TO ULT
1955	*	183,537,900	1.000000	8	1.0000	1991		1,006,254,873	0.9995		1.0013	25th TO ULT
1956	*	193,197,790	1.000000	11	1.0000	1992		843,389,302	1.0000		1.0013	24th TO ULT
1957	*	203,366,095	1.000000	16	1.0000	1993		736,272,214	0.9999		1.0012	23rd TO ULT
1958	*	214,069,573	1.000000	22	1.0000	1994		686,497,154	0.9998		1.0010	22nd TO ULT
1959	*	225,336,393	1.000000	31	1.0000	1995		580,597,103	1.0009		1.0019	21st TO ULT
1960	*	237,196,203	1.000000	43	1.0000	1996		497,365,687	0.9998		1.0017	20th TO ULT
1961	*	249,680,214	1.000000	61	1.0000	1997		504,496,406	1.0004			
1962	*	262,821,278	1.000000	86	1.0000	1998		499,164,890	0.9999			
1963	*	276,653,976	1.000000	120	1.0000	1999		563,723,401	1.0006			
1964	*	291,214,712	1.000001	169	1.0000	2000		597,954,900	1.0012			
1965	*	306,541,802	1.000001	237	1.0000	2001		627,958,455	1.0001			
1966	*	322,675,581	1.000001	332	1.0000	2002		674,041,682	1.0014			
1967	*	339,658,507	1.000001	466	1.0000	2003		658,465,461	1.0016			
1968	*	357,535,270	1.000002	655	1.0000	2004		695,881,890	1.0009			
1969	*	376,352,916	1.000002	919	1.0000	2005		699,947,489	1.0011			
1970	*	396,160,964	1.000003	1,289	1.0000	2006		720,191,112	1.0011			
1971	*	417,011,541	1.000004	1,810	1.0000	2007		758,126,829	1.0033			
1972	*	438,959,517	1.000006	2,540	1.0000	2008		706,470,506	1.0015			
1973	*	462,062,649	1.000008	3,565	1.0000	2009		639,234,796	1.0043			
1974	*	486,381,736	1.000010	5,003	1.0000	2010		660,206,261	1.0068			
1975	*	511,980,775	1.000014	7,022	1.0001	2011		635,550,757	1.0078			
1976	*	538,927,132	1.000018	9,855	1.0001	2012		577,924,257	1.0050			
1977	*	567,291,717	1.000024	13,832	1.0001	2013		581,154,570	1.0105			
1978	*	597,149,176	1.000033	19,413	1.0001	2014		556,791,346	1.0864			
1979	*	628,578,080	1.000043	27,245	1.0002	2015		498,025,442	1.3372			
1980	*	661,661,137	1.000058	38,239	1.0002	2016		364,613,082	3.3664			
1981	*	696,485,408	1.000077	53,667	1.0003	2017		114,741,844				

MEDICAL 16 vs 17

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1987 PYs Incurred	2,095,988,490	1 PY 1986 Incurred = (Average of 1987, 1988, 1989) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1987 PYs Incurred	2,092,785,573	2 PY 1985 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1987 PYs	3,202,917	3 PY 1986 LDF selected based on balancing Prior to 1987 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1987 Incurred	437,638,844	4 PY 1985 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1987 PYs in Prior to 1987 PYs Data	4.79	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1987 PYs: 3,202,917
Selected Average PY Deflation Factor	0.93	Total Dollar Development: 3,202,917
		Difference: 0

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/17	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/17	Prior Year LDF	Dollar Development	Cumulative LDF	
1946	*	25,521,630	1.000000	1	1.0000	1982	*	347,954,337	1.000660	229,475	1.0026	34TH TO ULT
1947	*	27,442,613	1.000000	1	1.0000	1983	*	374,144,448	1.000880	328,924	1.0035	33RD TO ULT
1948	*	29,508,185	1.000000	1	1.0000	1984	*	402,305,858	1.001173	471,438	1.0047	32ND TO ULT
1949	*	31,729,232	1.000000	2	1.0000	1985	*	432,586,945	1.001564	675,632	1.0063	31ST TO ULT
1950	*	34,117,453	1.000000	2	1.0000	1986	*	465,147,252	1.00208571	968,144	1.0084	30th TO ULT
1951	*	36,685,434	1.000000	3	1.0000	1987		445,607,513	1.0182		1.0267	29th TO ULT
1952	*	39,446,703	1.000000	5	1.0000	1988		524,711,194	0.9981		1.0248	28th TO ULT
1953	*	42,415,810	1.000000	7	1.0000	1989		643,095,279	1.0015		1.0263	27th TO ULT
1954	*	45,608,398	1.000000	10	1.0000	1990		663,442,072	1.0018		1.0282	26th TO ULT
1955	*	49,041,288	1.000000	14	1.0000	1991		610,953,160	1.0021		1.0303	25th TO ULT
1956	*	52,732,567	1.000000	20	1.0000	1992		536,685,035	1.0007		1.0310	24th TO ULT
1957	*	56,701,685	1.000000	28	1.0000	1993		419,832,793	1.0035		1.0346	23rd TO ULT
1958	*	60,969,554	1.000001	40	1.0000	1994		398,732,142	1.0028		1.0375	22nd TO ULT
1959	*	65,558,660	1.000001	58	1.0000	1995		366,032,892	1.0016		1.0392	21st TO ULT
1960	*	70,493,183	1.000001	83	1.0000	1996		367,707,346	1.0079		1.0474	20th TO ULT
1961	*	75,799,122	1.000002	119	1.0000	1997		382,301,878	0.9982			
1962	*	81,504,432	1.000002	171	1.0000	1998		402,951,814	1.0153			
1963	*	87,639,174	1.000003	245	1.0000	1999		432,265,047	0.9984			
1964	*	94,235,671	1.000004	351	1.0000	2000		462,045,801	1.0026			
1965	*	101,328,679	1.000005	503	1.0000	2001		466,305,560	1.0017			
1966	*	108,955,568	1.000007	721	1.0000	2002		536,277,184	1.0057			
1967	*	117,156,525	1.000009	1,033	1.0000	2003		552,047,850	1.0046			
1968	*	125,974,758	1.000012	1,481	1.0000	2004		605,522,820	1.0032			
1969	*	135,456,729	1.000016	2,124	1.0001	2005		634,622,287	1.0073			
1970	*	145,652,397	1.000021	3,045	1.0001	2006		644,541,197	1.0046			
1971	*	156,615,481	1.000028	4,365	1.0001	2007		692,152,336	1.0022			
1972	*	168,403,743	1.000037	6,258	1.0001	2008		623,411,445	0.9978			
1973	*	181,079,293	1.000050	8,972	1.0002	2009		552,881,259	0.9971			
1974	*	194,708,918	1.000066	12,863	1.0003	2010		601,930,105	1.0082			
1975	*	209,364,427	1.000088	18,441	1.0004	2011		593,729,286	1.0084			
1976	*	225,123,040	1.000117	26,438	1.0005	2012		553,227,436	1.0309			
1977	*	242,067,785	1.000157	37,903	1.0006	2013		574,658,775	0.9973			
1978	*	260,287,941	1.000209	54,339	1.0008	2014		565,563,887	1.0202			
1979	*	279,879,507	1.000278	77,899	1.0011	2015		528,855,104	1.0478			
1980	*	300,945,706	1.000371	111,673	1.0015	2016		490,693,171	2.1990			
1981	*	323,597,533	1.000495	160,085	1.0020	2017		248,019,525				

INDEMNITY 15 vs 16

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1986 PYs Incurred	4,745,489,731	1 PY 1985 Incurred = (Average of 1986, 1987, 1988) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1986 PYs Incurred	4,745,177,980	2 PY 1984 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1986 PYs	311,751	3 PY 1985 LDF selected based on balancing Prior to 1986 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1986 Incurred	721,153,650	4 PY 1984 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1986 PYs in Prior to 1986 PYs Data	6.58	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1986 PYs: 311,751
Selected Average PY Deflation Factor	0.95	Total Dollar Development: 311,752
		Difference: -1

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/16	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/16	Prior Year LDF	Dollar Development	Cumulative LDF	
1945	*	99,789,611	1.000000	0	1.0000	1981	*	632,463,603	1.000037	23,100	1.0001	34TH TO ULT
1946	*	105,041,695	1.000000	0	1.0000	1982	*	665,751,161	1.000049	32,420	1.0002	33RD TO ULT
1947	*	110,570,206	1.000000	0	1.0000	1983	*	700,790,696	1.000065	45,501	1.0003	32ND TO ULT
1948	*	116,389,690	1.000000	0	1.0000	1984	*	737,674,417	1.000087	63,860	1.0003	31ST TO ULT
1949	*	122,515,463	1.000000	0	1.0000	1985	*	776,499,386	1.00011544	89,625	1.0005	30TH TO ULT
1950	*	128,963,646	1.000000	1	1.0000	1986		721,423,366	1.0004		1.0009	29TH TO ULT
1951	*	135,751,206	1.000000	1	1.0000	1987		872,323,486	0.9992		1.0001	28th TO ULT
1952	*	142,896,006	1.000000	1	1.0000	1988		987,414,544	1.0004		1.0005	27th TO ULT
1953	*	150,416,849	1.000000	2	1.0000	1989		1,148,185,169	1.0005		1.0010	26th TO ULT
1954	*	158,333,525	1.000000	2	1.0000	1990		1,173,634,949	1.0006		1.0016	25th TO ULT
1955	*	166,666,868	1.000000	3	1.0000	1991		1,013,820,336	1.0008		1.0024	24th TO ULT
1956	*	175,438,809	1.000000	5	1.0000	1992		851,993,670	1.0011		1.0035	23rd TO ULT
1957	*	184,672,430	1.000000	7	1.0000	1993		743,375,567	1.0002		1.0037	22nd TO ULT
1958	*	194,392,032	1.000000	9	1.0000	1994		679,124,242	1.0017		1.0054	21st TO ULT
1959	*	204,623,192	1.000000	13	1.0000	1995		572,479,411	0.9984		1.0038	20th TO ULT
1960	*	215,392,833	1.000000	19	1.0000	1996		489,052,264	0.9999			
1961	*	226,729,298	1.000000	26	1.0000	1997		499,333,753	1.0021			
1962	*	238,662,419	1.000000	37	1.0000	1998		496,989,793	1.0003			
1963	*	251,223,599	1.000000	52	1.0000	1999		564,142,781	1.0005			
1964	*	264,445,894	1.000000	73	1.0000	2000		600,237,959	0.9999			
1965	*	278,364,099	1.000000	102	1.0000	2001		603,932,408	1.0013			
1966	*	293,014,841	1.000000	143	1.0000	2002		629,926,963	1.0016			
1967	*	308,436,675	1.000001	201	1.0000	2003		613,382,480	1.0007			
1968	*	324,670,184	1.000001	282	1.0000	2004		662,136,395	1.0014			
1969	*	341,758,088	1.000001	395	1.0000	2005		676,903,388	1.0014			
1970	*	359,745,356	1.000002	555	1.0000	2006		703,215,817	1.0025			
1971	*	378,679,322	1.000002	779	1.0000	2007		742,284,269	1.0013			
1972	*	398,609,813	1.000003	1,093	1.0000	2008		686,046,358	0.9999			
1973	*	419,589,276	1.000004	1,534	1.0000	2009		625,080,978	1.0058			
1974	*	441,672,923	1.000005	2,153	1.0000	2010		646,464,468	1.0002			
1975	*	464,918,866	1.000007	3,022	1.0000	2011		618,761,328	1.0040			
1976	*	489,388,280	1.000009	4,242	1.0000	2012		549,092,227	1.0319			
1977	*	515,145,558	1.000012	5,953	1.0000	2013		550,876,199	1.0948			
1978	*	542,258,482	1.000015	8,355	1.0001	2014		491,422,631	1.3303			
1979	*	570,798,402	1.000021	11,727	1.0001	2015		349,068,153	3.2468			
1980	*	600,840,423	1.000027	16,459	1.0001	2016		99,813,347				

MEDICAL 15 vs 16

Inputs and Notes for Tail Factor Estimation

Latest 12/31 Prior to 1986 PYs Incurred	1,819,884,532	1 PY 1985 Incurred = (Average of 1986, 1987, 1988) x (PY Deflation Factor ^ 2)
Next Latest 12/31 Prior to 1986 PYs Incurred	1,815,292,120	2 PY 1984 & Prior Incurred = Subsequent Year x PY Deflation
CY Development of Prior to 1986 PYs	4,592,412	3 PY 1985 LDF selected based on balancing Prior to 1986 PYs Total Dollar Dev. to Actual CY Dev.
Next Latest PY 1986 Incurred	326,405,356	4 PY 1984 & Prior LDFs = (Subsequent Year - 1.0) x Selected Decrement + 1.0
# of 1986 PYs in Prior to 1986 PYs Data	5.58	
Selected Decrement Development Factor	0.75	CY Development of Prior to 1986 PYs: 4,592,412
Selected Average PY Deflation Factor	0.93	Total Dollar Development: 4,592,413
		Difference: -1

Tail Factor Model - 2024 Loss Cost Filing

Policy Year	(*=Estimate)	Incurred as of 12/31/16	Prior Year LDF	Dollar Development	Cumulative LDF	Policy Year	(*=Estimate)	Incurred as of 12/31/16	Prior Year LDF	Dollar Development	Cumulative LDF	
1945	*	20,371,808	1.000000	1	1.0000	1981	*	277,743,188	1.001187	329,200	1.0048	34TH TO ULT
1946	*	21,905,169	1.000000	1	1.0000	1982	*	298,648,589	1.001582	471,785	1.0063	33RD TO ULT
1947	*	23,553,946	1.000000	2	1.0000	1983	*	321,127,515	1.002110	676,038	1.0085	32ND TO ULT
1948	*	25,326,823	1.000000	2	1.0000	1984	*	345,298,404	1.002813	968,550	1.0113	31ST TO ULT
1949	*	27,233,143	1.000000	3	1.0000	1985	*	371,288,606	1.00375047	1,387,305	1.0151	30TH TO ULT
1950	*	29,282,950	1.000000	5	1.0000	1986		329,202,606	1.0086		1.0238	29th TO ULT
1951	*	31,487,043	1.000000	7	1.0000	1987		434,847,726	1.0013		1.0252	28th TO ULT
1952	*	33,857,035	1.000000	10	1.0000	1988		523,804,702	1.0017		1.0269	27th TO ULT
1953	*	36,405,414	1.000000	14	1.0000	1989		641,859,811	1.0067		1.0338	26th TO ULT
1954	*	39,145,607	1.000001	20	1.0000	1990		658,809,222	1.0055		1.0395	25th TO ULT
1955	*	42,092,050	1.000001	28	1.0000	1991		609,613,045	0.9988		1.0382	24th TO ULT
1956	*	45,260,269	1.000001	40	1.0000	1992		533,783,612	1.0045		1.0429	23rd TO ULT
1957	*	48,666,956	1.000001	58	1.0000	1993		414,671,416	1.0057		1.0488	22nd TO ULT
1958	*	52,330,060	1.000002	83	1.0000	1994		388,068,541	1.0053		1.0544	21st TO ULT
1959	*	56,268,882	1.000002	119	1.0000	1995		355,595,791	0.9991		1.0534	20th TO ULT
1960	*	60,504,174	1.000003	171	1.0000	1996		350,308,852	1.0060			
1961	*	65,058,252	1.000004	245	1.0000	1997		375,918,546	1.0052			
1962	*	69,955,109	1.000005	351	1.0000	1998		388,985,978	1.0010			
1963	*	75,220,547	1.000007	503	1.0000	1999		428,134,150	1.0035			
1964	*	80,882,309	1.000009	721	1.0000	2000		449,479,718	1.0048			
1965	*	86,970,225	1.000012	1,034	1.0000	2001		445,565,619	1.0019			
1966	*	93,516,371	1.000016	1,483	1.0001	2002		495,555,910	1.0033			
1967	*	100,555,237	1.000021	2,126	1.0001	2003		508,251,806	1.0069			
1968	*	108,123,911	1.000028	3,048	1.0001	2004		575,507,521	0.9996			
1969	*	116,262,270	1.000038	4,370	1.0002	2005		606,206,438	1.0083			
1970	*	125,013,194	1.000050	6,265	1.0002	2006		623,546,703	1.0041			
1971	*	134,422,789	1.000067	8,982	1.0003	2007		670,707,343	1.0062			
1972	*	144,540,633	1.000089	12,878	1.0004	2008		603,236,759	0.9991			
1973	*	155,420,036	1.000119	18,462	1.0005	2009		541,865,628	1.0162			
1974	*	167,118,318	1.000158	26,468	1.0006	2010		595,738,577	0.9987			
1975	*	179,697,116	1.000211	37,944	1.0008	2011		576,761,963	1.0088			
1976	*	193,222,706	1.000282	54,397	1.0011	2012		510,306,935	1.0047			
1977	*	207,766,350	1.000375	77,981	1.0015	2013		554,013,130	1.0201			
1978	*	223,404,677	1.000501	111,787	1.0020	2014		533,464,895	1.0717			
1979	*	240,220,083	1.000668	160,241	1.0027	2015		468,896,395	2.1736			
1980	*	258,301,165	1.000890	229,685	1.0036	2016		199,538,261				

The Estimation of Loss Development Tail Factors: Weibull Curve Fit

Five-Year Average of Incurred Development Factors

Development Period	Average Age of Claim (x)	Unfitted Indemnity LDF	Fitted Cumulative Indemnity LDF *	Unfitted Medical LDF	Fitted Cumulative Medical LDF *
(2)	(3)	(4)	(5)	(6)	(7)
1/2	1.5	1.3316	1.5399	1.0392	1.2575
2/3	2.5	1.0704	1.4080	1.0069	1.2248
3/4	3.5	1.0152	1.3149	0.9999	1.1969
4/5	4.5	1.0009	1.2468	0.9932	1.1730
5/6	5.5	1.0029	1.1956	1.0002	1.1523
6/7	6.5	1.0024	1.1563	1.0033	1.1344
7/8	7.5	1.0029	1.1258	1.0035	1.1188
8/9	8.5	1.0006	1.1018	1.0042	1.1052
9/10	9.5	1.0006	1.0826	0.9998	1.0933
10/11	10.5	1.0021	1.0673	0.9989	1.0828
11/12	11.5	1.0015	1.0550	1.0022	1.0736
12/13	12.5	1.0017	1.0450	1.0026	1.0655
13/14	13.5	1.0010	1.0369	1.0066	1.0583
14/15	14.5	0.9998	1.0303	1.0045	1.0520
15/16	15.5	1.0001	1.0249	1.0043	1.0463
16/17	16.5	1.0005	1.0205	1.0006	1.0413
17/18	17.5	1.0012	1.0169	1.0033	1.0369
18/19	18.5	1.0004	1.0139	1.0014	1.0329
19/20	19.5	1.0001	1.0115	1.0031	1.0294
20/21	20.5	1.0004	1.0095	1.0008	1.0263
21/22	21.5	1.0002	1.0078	0.9995	1.0235
22/23	22.5	1.0004	1.0065	1.0023	1.0210
23/24	23.5	0.9999	1.0053	1.0036	1.0188
24/25	24.5	1.0006	1.0044	1.0004	1.0168
25/26	25.5	1.0014	1.0036	0.9984	1.0151
26/27	26.5	1.0015	1.0030	1.0039	1.0135
27/28	27.5	1.0009	1.0025	1.0048	1.0121
28/29	28.5	1.0010	1.0020	1.0080	1.0108
29/30	29.5	1.0003	1.0017	1.0011	1.0097
30/31	30.5		1.0014		1.0087

Curve Fit Parameters

	# of Data		Selected Parameters			Tail Factor 20th - Ult
	Data Points Used	Points Used	λ	c	t	
Indemnity	10-29	20	0.191	4.000	1.000	1.0095
Medical	10-29	20	0.109	13.000	1.000	1.0263

* Fitted Cumulative LDF (5) & (7) = $1 / e^{(-\lambda(x+c)^t)}$

INDEMNITY BRIDGE FACTORS
(Incurred Losses Divided by Paid Losses)

<u>EQUATION</u> <u>COEFFICIENTS</u>	Model	$Y = a+b/x^{.5}+c*exp(-x)$
	a	(0.009912772)
	b	0.10664952
	c	1.51271324

R^2 0.9988

<u>Report Period</u>	<u>2 Year Average</u>	<u>Points Used</u>	<u>Fitted Value</u>	<u>Selected</u>
1st	1.6540	1.6540	1.6532	
2nd	1.2665	1.2665	1.2702	
3rd	1.1282	1.1282	1.1270	
4th	1.0777	1.0777	1.0711	
5th	1.0544	1.0544	1.0480	
6th	1.0375	1.0375	1.0374	
7th	1.0288	1.0288	1.0318	
8th	1.0257	1.0257	1.0283	
9th	1.0272	1.0272	1.0258	
10th	1.0252	1.0252	1.0239	
11th	1.0196	1.0196	1.0223	
12th	1.0137	1.0137	1.0209	
13th	1.0125	1.0125	1.0197	
14th	1.0166	1.0166	1.0186	
15th	1.0170	1.0170	1.0176	
16th	1.0158	1.0158	1.0167	
17th	1.0169	1.0169	1.0160	
18th	1.0161	1.0161	1.0152	
19th	1.0123	1.0123	1.0146	
20th	1.0096	1.0096	1.0139	1.0139
21st	1.0086	1.0086	1.0134	1.0134
22nd	1.0071	1.0071	1.0128	1.0128
23rd	1.0073	1.0073	1.0123	1.0123
24th	1.0078	1.0078	1.0119	1.0119
25th	1.0124	1.0124	1.0114	1.0114
26th	1.0169	1.0169	1.0110	1.0110
27th	1.0188	1.0188	1.0106	1.0106
28th	1.0189	1.0189	1.0102	1.0102
29th	1.0200	1.0200	1.0099	1.0099
30th			1.0096	1.0096
31st			1.0092	1.0092
32nd			1.0089	1.0089
33rd			1.0087	1.0087
34th			1.0084	1.0084
35th			1.0081	1.0081
36th			1.0079	1.0079
37th			1.0076	1.0076
38th			1.0074	1.0074
39th			1.0072	1.0072
40th			1.0069	1.0069
41st			1.0067	1.0067
42nd			1.0065	1.0065
43rd			1.0064	1.0064
44th			1.0062	1.0062
45th			1.0060	1.0060
46th			1.0058	1.0058
47th			1.0056	1.0056
48th			1.0055	1.0055
49th			1.0053	1.0053
50th	1.0000	1.0000	1.0052	1.0052

Bridge Factor (Average of Selected Factors)

1.0086

* Selected

MEDICAL BRIDGE FACTORS
(Incurred Losses Divided by Paid Losses)

	Model	$Y = a+b/x+c/x^2+d/x^3+e/x^4$
<u>EQUATION</u> <u>COEFFICIENTS</u>	a	0.036101584
	b	(0.040954046)
	c	1.837909392
	d	(3.387075471)
	e	1.95314889
	R ²	0.9720

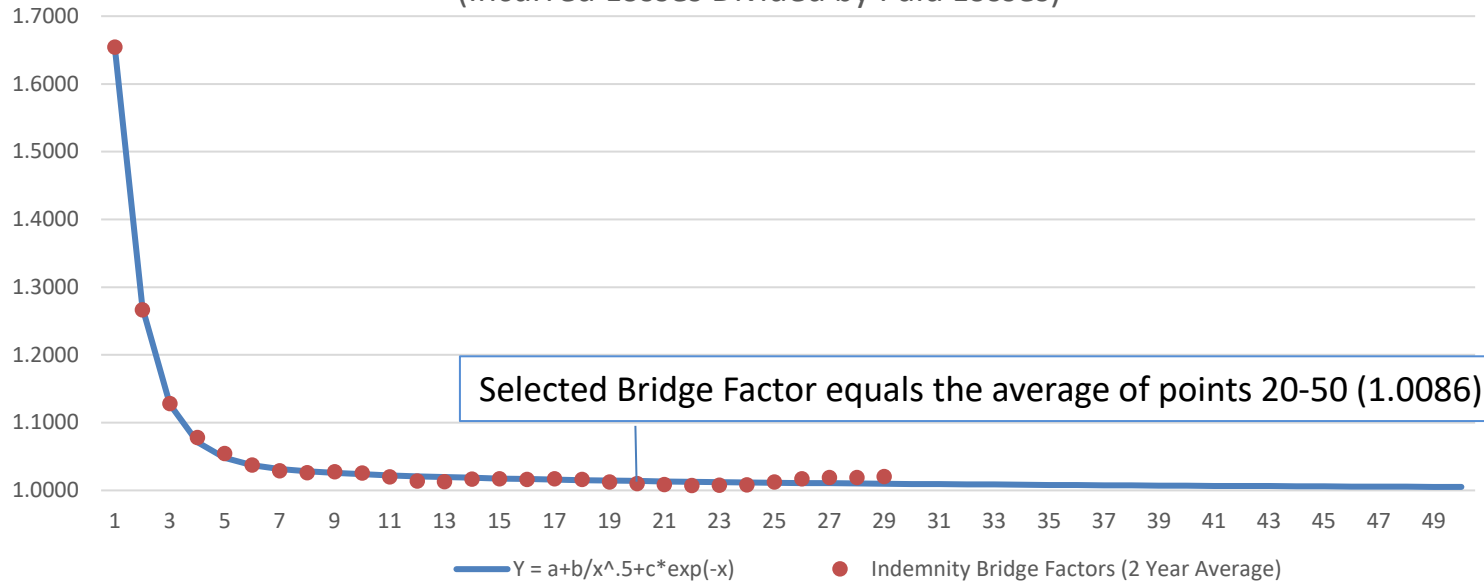
<u>Report Period</u>	<u>2 Year Average</u>	<u>Points Used</u>	<u>Fitted Value</u>	<u>Selected</u>
1st	1.4008	1.4008	1.3991	
2nd	1.1703	1.1703	1.1738	
3rd	1.1378	1.1378	1.1253	
4th	1.0997	1.0997	1.0954	
5th	1.0544	1.0544	1.0775	
6th	1.0571	1.0571	1.0662	
7th	1.0588	1.0588	1.0587	
8th	1.0516	1.0516	1.0536	
9th	1.0690	1.0690	1.0499	
10th	1.0606	1.0606	1.0472	
11th	1.0465	1.0465	1.0452	
12th	1.0369	1.0369	1.0436	
13th	1.0281	1.0281	1.0424	
14th	1.0302	1.0302	1.0414	
15th	1.0392	1.0392	1.0406	
16th	1.0484	1.0484	1.0399	
17th	1.0411	1.0411	1.0394	
18th	1.0335	1.0335	1.0389	
19th	1.0342	1.0342	1.0386	
20th	1.0293		1.0382	1.0382
21st	1.0339		1.0380	1.0380
22nd	1.0384		1.0377	1.0377
23rd	1.0500		1.0375	1.0375
24th	1.0612		1.0373	1.0373
25th	1.0500		1.0372	1.0372
26th	1.0393	1.0393	1.0371	1.0371
27th	1.0476	1.0476	1.0369	1.0369
28th	1.0411	1.0411	1.0368	1.0368
29th	1.0530	1.0530	1.0367	1.0367
30th			1.0367	1.0367
31st			1.0366	1.0366
32nd			1.0365	1.0365
33rd			1.0365	1.0365
34th			1.0364	1.0364
35th			1.0364	1.0364
36th			1.0363	1.0363
37th			1.0363	1.0363
38th			1.0362	1.0362
39th			1.0362	1.0362
40th			1.0362	1.0362
41st			1.0361	1.0361
42nd			1.0361	1.0361
43rd			1.0361	1.0361
44th			1.0361	1.0361
45th			1.0361	1.0361
46th			1.0360	1.0360
47th			1.0360	1.0360
48th			1.0360	1.0360
49th			1.0360	1.0360
50th	1.0000	1.0000	1.0360	1.0360

Bridge Factor (Average of Selected Factors)

1.0366

* Selected

Indemnity Bridge Factors (Incurred Losses Divided by Paid Losses)



Medical Bridge Factors (Incurred Losses Divided by Paid Losses)

