

PENNSYLVANIA COMPENSATION RATING BUREAU

Tail Factors for Loss Development

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

Thus, the 2008 vs. 2009, 2009 vs. 2010, 2010 vs. 2011 and 2011 vs. 2012 valuations in the tail factor calculation will use policy year 1986 as the earliest separate policy year and an aggregate line of experience for policy years 1985 and prior.

The following discussion focuses on data with an earliest available policy year of 1978 for illustrative purposes. The discussion for data starting with later policy years would, however, be analogous.

Prior to 1995, the PCRB has computed incurred loss development for maturities older than policy year 1978 (i.e., the pre-1978 “tail”) by comparing the total amount of dollar development in incurred losses occurring in a given calendar year to the incurred loss reported for policy year 1978 at the beginning of that same calendar period.

As part of the Insurance Department’s examination of the Bureau, the actuarial firm retained to perform portions of that review commented that the PCRB’s approach effectively assumed that each policy year prior to 1978 had the same amount of ultimate losses as did policy year 1978. Since policy year losses have tended to increase from year to year in response to benefit and price changes, changes in employment volume and other features affecting loss trends, this assumption was noted as understating the true tail in the PCRB’s loss development analysis. The contractor recommended that for future filings the PCRB add a growth adjustment to its tail factor calculation.

In response to this recommendation the PCRB changed its derivation of tail factors for its 12/1/95 filing. That approach, used again for this filing, is applied separately for indemnity and medical loss experience and for each calendar year of experience, and outlined as follows:

1. A starting policy year loss amount based on the average reported incurred loss for policy years 1978-1980 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 policy year 1977 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 policy year 1977 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 1978.
6. The “tail factor” applicable to maturities prior to policy year 1978 based on that calendar year of experience was then computed as the cumulative product of the series of loss development factors constructed in #5.

In general, this approach produced policy year incurred losses and loss development factors such that measurable development terminated for policy years in the mid- to early 1930's. Because the amount of calendar year development observed for policy years prior to 1978 varied considerably from year to year, some variations in the application of the initial selected loss development factor were necessary (i.e., whether the initial selection was applied to 1,2 or 3 prior policy years before beginning the application of the selected rate of decline in loss development). In addition, the selected rates of decline in loss development factors vary from calendar year to calendar year in order to achieve the desired balance with observed calendar year development.

Recognizing the volatility of observed calendar year development for policy years prior to 1978 in the aggregate, the PCRB elected to use an experience period comprising four calendar years of loss development in computing indicated tail factors for this filing.

A summary exhibit on page 1 presents results of the tail development factor calculations. Following the summary page, eight exhibits presenting the derivation of indicated tail factors using the procedure outlined above are attached (four for indemnity and four for medical). These exhibits are numbered as pages 2 through 9 respectively.

SUMMARY OF LOSS DEVELOPMENT TAIL FACTOR CALCULATIONS

VALUATION	MATURITY	<u>INDEMNITY</u>	<u>MEDICAL</u>
		Tail Factor	Tail Factor
11V12	25TH TO ULT.	1.0021	1.0234
10V11	25TH TO ULT.	1.0044	1.0807
09V10	25TH TO ULT.	1.0017	1.0333
08V09	25TH TO ULT.	1.0029	1.0159
AVERAGE OF LATEST 4 VALUATIONS		1.0028	1.0383

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Indemnity: 11v12

Latest 12/31 Prior to 1986 Incurred	4,651,066,982
Next Latest 12/31 Prior to 1986 Incurred	4,650,124,385
CY Development of Prior Yrs	942,597
Next Latest PY 1986 Incurred	718,885,602
# of 1986 Yrs in Prior Data	6.47
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = .0000 vs 1.0013 942,596
1

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/12 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/12 Incurred	Prior Year Development	Dollar Development	DF	
1942	*	85,250,449	1.000000	0	1.0000	#	1978	*	540,314,827	1.000047	25,266	1.0002
1943	*	89,737,315	1.000000	0	1.0000	#	1979	*	568,752,449	1.000062	35,460	1.0002
1944	*	94,460,331	1.000000	0	1.0000	#	1980	*	598,686,789	1.000083	49,768	1.0003
1945	*	99,431,928	1.000000	0	1.0000	#	1981	*	630,196,620	1.000111	69,847	1.0004
1946	*	104,665,187	1.000000	0	1.0000	#	1982	*	663,364,863	1.000148	98,028	1.0006
1947	*	110,173,881	1.000000	1	1.0000	#	1983	*	698,278,803	1.000197	137,576	1.0008
1948	*	115,972,507	1.000000	1	1.0000	#	1984	*	735,030,319	1.000263	193,076	1.0011
1949	*	122,076,323	1.000000	1	1.0000	#	1985	*	773,716,125	1.0003503290	270,960	1.0014
1950	*	128,501,392	1.000000	2	1.0000	#	1986		719,362,768	1.0007		1.0021
1951	*	135,264,624	1.000000	3	1.0000	#	1987		869,655,782	1.0011		
1952	*	142,383,814	1.000000	4	1.0000	#	1988		982,891,008	0.9975		
1953	*	149,877,699	1.000000	5	1.0000	#	1989		1,141,036,855	1.0022		
1954	*	157,765,999	1.000000	7	1.0000	#	1990		1,167,319,152	1.0001		
1955	*	166,069,473	1.000000	10	1.0000	#	1991		1,019,057,615	1.0013	Total	
1956	*	174,809,971	1.000000	15	1.0000	#	1992		862,596,981	1.0026	Development:	
1957	*	184,010,496	1.000000	20	1.0000	#	1993		744,496,499	0.9996	942,596	
1958	*	193,695,259	1.000000	29	1.0000	#	1994		692,048,789	1.0011		
1959	*	203,889,746	1.000000	40	1.0000	#	1995		595,977,072	1.0007		
1960	*	214,620,786	1.000000	57	1.0000	#	1996		519,770,591	1.0027		
1961	*	225,916,617	1.000000	79	1.0000	#	1997		541,873,259	1.0021		
1962	*	237,806,965	1.000000	111	1.0000	#	1998		545,427,090	0.9991		
1963	*	250,323,121	1.000001	156	1.0000	#	1999		613,047,690	1.0010		
1964	*	263,498,022	1.000001	220	1.0000	#	2000		650,078,292	1.0018		
1965	*	277,366,339	1.000001	308	1.0000	#	2001		663,220,572	1.0027		
1966	*	291,964,567	1.000001	432	1.0000	#	2002		701,538,773	0.9997		
1967	*	307,331,123	1.000002	607	1.0000	#	2003		672,392,878	1.0033		
1968	*	323,506,446	1.000003	852	1.0000	#	2004		699,081,260	1.0043		
1969	*	340,533,101	1.000004	1,196	1.0000	#	2005		706,144,292	1.0021		
1970	*	358,455,896	1.000005	1,678	1.0000	#	2006		725,831,284	1.0012		
1971	*	377,321,995	1.000006	2,355	1.0000	#	2007		764,239,124	1.0015		
1972	*	397,181,048	1.000008	3,306	1.0000	#	2008		706,657,550	1.0216		
1973	*	418,085,313	1.000011	4,640	1.0000	#	2009		622,738,702	1.0962		
1974	*	440,089,804	1.000015	6,512	1.0001	#	2010		589,238,082	1.4151		
1975	*	463,252,425	1.000020	9,139	1.0001	#	2011		419,474,667	3.3434		
1976	*	487,634,131	1.000026	12,827	1.0001	#	2012		116,553,217			
1977	*	513,299,086	1.000035	18,002	1.0001	#						

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Medical 11v12

Latest 12/31 Prior to 1986 Incurred	1,483,288,746
Next Latest 12/31 Prior to 1986 Incurred	1,479,131,550
CY Development of Prior Yrs	4,157,196
Next Latest PY 1986 Incurred	326,455,608
# of 1986 Yrs in Prior Data	4.54
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = .0000 vs 1.0127 4,157,196
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/12 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/12 Incurred	Prior Year Development	Dollar Development	DF
1942	*	16,372,154	1.000000	0	1.0000 #	1978	*	223,213,097	1.000453	101,175	1.0018
1943	*	17,604,467	1.000000	0	1.0000 #	1979	*	240,014,083	1.000605	145,032	1.0024
1944	*	18,929,534	1.000000	0	1.0000 #	1980	*	258,079,659	1.000806	207,889	1.0032
1945	*	20,354,338	1.000000	1	1.0000 #	1981	*	277,505,009	1.001075	297,969	1.0043
1946	*	21,886,385	1.000000	1	1.0000 #	1982	*	298,392,483	1.001433	427,042	1.0057
1947	*	23,533,747	1.000000	1	1.0000 #	1983	*	320,852,132	1.001911	611,955	1.0077
1948	*	25,305,104	1.000000	2	1.0000 #	1984	*	345,002,293	1.002548	876,798	1.0102
1949	*	27,209,789	1.000000	3	1.0000 #	1985	*	370,970,207	1.003397201	1,255,993	1.0137 26TH TO ULT
1950	*	29,257,838	1.000000	4	1.0000 #	1986		329,574,624	1.0096		1.0234 25TH TO ULT
1951	*	31,460,041	1.000000	6	1.0000 #	1987		433,129,555	1.0049		
1952	*	33,828,001	1.000000	9	1.0000 #	1988		524,046,454	1.0038		
1953	*	36,374,195	1.000000	12	1.0000 #	1989		638,925,837	1.0078		
1954	*	39,112,037	1.000000	18	1.0000 #	1990		663,332,849	1.0034		
1955	*	42,055,954	1.000001	26	1.0000 #	1991		620,233,502	1.0085	Total	
1956	*	45,221,456	1.000001	37	1.0000 #	1992		565,831,906	1.0095	Development:	
1957	*	48,625,221	1.000001	52	1.0000 #	1993		474,124,427	1.0088	4,157,196	
1958	*	52,285,184	1.000001	75	1.0000 #	1994		455,628,054	1.0201		
1959	*	56,220,628	1.000002	108	1.0000 #	1995		417,940,397	1.0064		
1960	*	60,452,289	1.000003	155	1.0000 #	1996		416,740,312	1.0082		
1961	*	65,002,461	1.000003	222	1.0000 #	1997		444,757,284	1.0087		
1962	*	69,895,119	1.000005	318	1.0000 #	1998		466,763,894	1.0090		
1963	*	75,156,042	1.000006	455	1.0000 #	1999		511,247,992	1.0022		
1964	*	80,812,949	1.000008	653	1.0000 #	2000		517,872,829	1.0033		
1965	*	86,895,644	1.000011	936	1.0000 #	2001		512,973,389	1.0043		
1966	*	93,436,176	1.000014	1,342	1.0001 #	2002		550,401,730	1.0031		
1967	*	100,469,006	1.000019	1,924	1.0001 #	2003		558,416,353	1.0120		
1968	*	108,031,190	1.000026	2,759	1.0001 #	2004		594,384,193	1.0051		
1969	*	116,162,569	1.000034	3,955	1.0001 #	2005		610,882,512	0.9971		
1970	*	124,905,989	1.000045	5,670	1.0002 #	2006		618,262,258	1.0077		
1971	*	134,307,515	1.000061	8,129	1.0002 #	2007		672,439,731	0.9959		
1972	*	144,416,682	1.000081	11,655	1.0003 #	2008		605,956,857	1.0003		
1973	*	155,286,755	1.000108	16,709	1.0004 #	2009		557,750,908	1.0270		
1974	*	166,975,006	1.000143	23,954	1.0006 #	2010		607,833,799	1.0831		
1975	*	179,543,017	1.000191	34,342	1.0008 #	2011		567,398,641	2.1071		
1976	*	193,057,007	1.000255	49,232	1.0010 #	2012		247,874,237			
1977	*	207,588,180	1.000340	70,578	1.0014 #						

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Indemnity: 10v11

Latest 12/31 Prior to 1986 Incurred	4,786,276,751
Next Latest 12/31 Prior to 1986 Incurred	4,783,310,914
CY Development of Prior Yrs	2,965,837
Next Latest PY 1986 Incurred	723,649,054
# of 1986 Yrs in Prior Data	6.61
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = .0000 vs 1.0041 2,965,838
-1

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/11 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/11 Incurred	Prior Year Development	Dollar Development	DF
1942	*	86,198,133	1.000000	0	1.0000 #	1977	*	519,005,159	1.000109	56,664	1.0004
1943	*	90,734,877	1.000000	1	1.0000 #	1978	*	546,321,220	1.000146	79,526	1.0006
1944	*	95,510,397	1.000000	1	1.0000 #	1979	*	575,074,968	1.000194	111,610	1.0008
1945	*	100,537,260	1.000000	1	1.0000 #	1980	*	605,342,072	1.000259	156,635	1.0010
1946	*	105,828,694	1.000000	2	1.0000 #	1981	*	637,202,181	1.000345	219,820	1.0014
1947	*	111,398,626	1.000000	2	1.0000 #	1982	*	670,739,137	1.000460	308,484	1.0018
1948	*	117,261,711	1.000000	3	1.0000 #	1983	*	706,041,197	1.000614	432,894	1.0025
1949	*	123,433,380	1.000000	4	1.0000 #	1984	*	743,201,260	1.000818	607,446	1.0033
1950	*	129,929,874	1.000000	6	1.0000 #	1985	*	782,317,116	1.0010906749	852,324	1.0044 25TH TO ULT
1951	*	136,768,288	1.000000	8	1.0000 #	1986		724,138,448	1.0007		
1952	*	143,966,619	1.000000	12	1.0000 #	1987		876,818,973	1.0002		
1953	*	151,543,810	1.000000	17	1.0000 #	1988		999,542,688	1.0015		
1954	*	159,519,800	1.000000	23	1.0000 #	1989		1,155,820,850	1.0037		
1955	*	167,915,579	1.000000	33	1.0000 #	1990		1,186,568,963	1.0010		
1956	*	176,753,241	1.000000	46	1.0000 #	1991		1,039,503,614	1.0007	Total	
1957	*	186,056,043	1.000000	64	1.0000 #	1992		885,735,961	1.0023	Development:	
1958	*	195,848,466	1.000000	90	1.0000 #	1993		766,710,739	1.0023	2,965,838	
1959	*	206,156,280	1.000001	127	1.0000 #	1994		707,391,976	1.0026		
1960	*	217,006,611	1.000001	178	1.0000 #	1995		611,754,336	1.0005		
1961	*	228,428,011	1.000001	250	1.0000 #	1996		534,368,625	1.0005		
1962	*	240,450,538	1.000001	351	1.0000 #	1997		558,093,394	1.0005		
1963	*	253,105,830	1.000002	492	1.0000 #	1998		570,406,550	1.0007		
1964	*	266,427,189	1.000003	691	1.0000 #	1999		644,724,536	1.0020		
1965	*	280,449,673	1.000003	970	1.0000 #	2000		686,812,258	1.0038		
1966	*	295,210,182	1.000005	1,361	1.0000 #	2001		678,564,277	1.0029		
1967	*	310,747,560	1.000006	1,911	1.0000 #	2002		702,989,793	1.0095		
1968	*	327,102,695	1.000008	2,682	1.0000 #	2003		670,435,033	1.0132		
1969	*	344,318,626	1.000011	3,764	1.0000 #	2004		697,115,544	1.0146		
1970	*	362,440,659	1.000015	5,283	1.0001 #	2005		705,359,481	1.0133		
1971	*	381,516,483	1.000019	7,414	1.0001 #	2006		725,842,732	1.0192		
1972	*	401,596,298	1.000026	10,406	1.0001 #	2007		763,871,297	1.0333		
1973	*	422,732,945	1.000035	14,604	1.0001 #	2008		692,790,945	1.1048		
1974	*	444,982,048	1.000046	20,497	1.0002 #	2009		569,411,306	1.4153		
1975	*	468,402,156	1.000061	28,767	1.0002 #	2010		417,090,247	3.3370		
1976	*	493,054,901	1.000082	40,374	1.0003 #	2011		125,567,147			

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Medical 10v11

Latest 12/31 Prior to 1986 Incurred	1,522,306,788
Next Latest 12/31 Prior to 1986 Incurred	1,498,586,145
CY Development of Prior Yrs	23,720,643
Next Latest PY 1986 Incurred	326,879,883
# of 1986 Yrs in Prior Data	4.66
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0807 vs 1.0726 23,720,643
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/11 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/11 Incurred	Prior Year Development	Dollar Development	DF	
1941	*	15,286,565	1.000000	1	1.0000	#	1977	*	208,412,493	1.001953	406,147	1.0078
1942	*	16,437,166	1.000000	1	1.0000	#	1978	*	224,099,455	1.002603	581,911	1.0105
1943	*	17,674,372	1.000000	2	1.0000	#	1979	*	240,967,156	1.003471	833,560	1.0140
1944	*	19,004,701	1.000000	3	1.0000	#	1980	*	259,104,469	1.004628	1,193,692	1.0187
1945	*	20,435,163	1.000000	4	1.0000	#	1981	*	278,606,955	1.006171	1,708,762	1.0249
1946	*	21,973,293	1.000000	6	1.0000	#	1982	*	299,577,372	1.008228	2,444,840	1.0334
1947	*	23,627,197	1.000000	8	1.0000	#	1983	*	322,126,206	1.010971	3,495,637	1.0447
1948	*	25,405,588	1.000000	12	1.0000	#	1984	*	346,372,264	1.014628	4,993,603	1.0600
1949	*	27,317,837	1.000001	17	1.0000	#	1985	*	372,443,295	1.019503671	7,125,047	1.0807 25TH TO ULT
1950	*	29,374,018	1.000001	24	1.0000	#	1986		328,500,537	1.0050		
1951	*	31,584,966	1.000001	35	1.0000	#	1987		434,507,788	1.0072		
1952	*	33,962,329	1.000001	50	1.0000	#	1988		528,851,873	1.0125		
1953	*	36,518,633	1.000002	72	1.0000	#	1989		643,191,153	1.0106		
1954	*	39,267,347	1.000003	103	1.0000	#	1990		670,831,301	1.0094	Total	
1955	*	42,222,954	1.000003	147	1.0000	#	1991		629,194,025	1.0009	Development:	
1956	*	45,401,026	1.000005	211	1.0000	#	1992		576,058,709	1.0095	23,720,643	
1957	*	48,818,308	1.000006	302	1.0000	#	1993		484,593,760	1.0060		
1958	*	52,492,804	1.000008	433	1.0000	#	1994		456,425,413	1.0141		
1959	*	56,443,875	1.000011	621	1.0000	#	1995		425,422,256	1.0075		
1960	*	60,692,339	1.000015	891	1.0001	#	1996		424,191,525	1.0077		
1961	*	65,260,579	1.000020	1,277	1.0001	#	1997		452,920,198	1.0099		
1962	*	70,172,666	1.000026	1,831	1.0001	#	1998		488,153,639	0.9911		
1963	*	75,454,480	1.000035	2,625	1.0001	#	1999		528,818,390	1.0186		
1964	*	81,133,849	1.000046	3,763	1.0002	#	2000		540,806,945	1.0033		
1965	*	87,240,698	1.000062	5,396	1.0002	#	2001		521,969,354	1.0107		
1966	*	93,807,202	1.000082	7,735	1.0003	#	2002		549,797,130	1.0151		
1967	*	100,867,959	1.000110	11,090	1.0004	#	2003		552,082,650	1.0082		
1968	*	108,460,171	1.000147	15,899	1.0006	#	2004		591,864,297	1.0112		
1969	*	116,623,840	1.000195	22,793	1.0008	#	2005		613,039,319	1.0113		
1970	*	125,401,979	1.000261	32,676	1.0010	#	2006		614,118,827	1.0126		
1971	*	134,840,837	1.000348	46,843	1.0014	#	2007		675,997,480	1.0186		
1972	*	144,990,147	1.000463	67,151	1.0019	#	2008		607,148,978	1.0374		
1973	*	155,903,384	1.000618	96,258	1.0025	#	2009		544,282,560	1.0806		
1974	*	167,638,048	1.000824	137,977	1.0033	#	2010		562,019,372	2.2256		
1975	*	180,255,965	1.001098	197,762	1.0044	#	2011		269,578,397			
1976	*	193,823,619	1.001464	283,425	1.0059							

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Indemnity: 09v10

Latest 12/31 Prior to 1986 Incurred	4,814,870,434
Next Latest 12/31 Prior to 1986 Incurred	4,813,299,084
CY Development of Prior Yrs	1,571,350
Next Latest PY 1986 Incurred	727,002,266
# of 1986 Yrs in Prior Data	6.62
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0023 vs 1.0022 1,571,350
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF	
1941	*	82,234,918	1.000000	0	1.0000	#	1976	*	495,142,355	1.000043	21,385	1.0002
1942	*	86,563,071	1.000000	0	1.0000	#	1977	*	521,202,479	1.000058	30,014	1.0002
1943	*	91,119,023	1.000000	0	1.0000	#	1978	*	548,634,188	1.000077	42,124	1.0003
1944	*	95,914,761	1.000000	0	1.0000	#	1979	*	577,509,672	1.000102	59,120	1.0004
1945	*	100,962,906	1.000000	1	1.0000	#	1980	*	607,904,918	1.000137	82,972	1.0005
1946	*	106,276,743	1.000000	1	1.0000	#	1981	*	639,899,913	1.000182	116,446	1.0007
1947	*	111,870,256	1.000000	1	1.0000	#	1982	*	673,578,856	1.000243	163,424	1.0010
1948	*	117,758,164	1.000000	2	1.0000	#	1983	*	709,030,375	1.000324	229,348	1.0013
1949	*	123,955,962	1.000000	2	1.0000	#	1984	*	746,347,763	1.000431	321,857	1.0017
1950	*	130,479,960	1.000000	3	1.0000	#	1985	*	785,629,224	1.0005752391	451,665	1.0023
1951	*	137,347,326	1.000000	4	1.0000	#	1986		728,208,005	1.0017		
1952	*	144,576,133	1.000000	6	1.0000	#	1987		880,584,420	0.9995		
1953	*	152,185,403	1.000000	9	1.0000	#	1988		1,002,717,462	1.0004		
1954	*	160,195,161	1.000000	12	1.0000	#	1989		1,155,458,023	0.9998		
1955	*	168,626,486	1.000000	17	1.0000	#	1990		1,188,730,687	1.0002	Total	
1956	*	177,501,564	1.000000	24	1.0000	#	1991		1,044,753,535	1.0027	Development:	
1957	*	186,843,751	1.000000	34	1.0000	#	1992		886,122,365	0.9989	1,571,350	
1958	*	196,677,633	1.000000	48	1.0000	#	1993		765,605,385	0.9998		
1959	*	207,029,087	1.000000	67	1.0000	#	1994		705,445,046	0.9994		
1960	*	217,925,355	1.000000	94	1.0000	#	1995		612,168,566	1.0006		
1961	*	229,395,111	1.000001	132	1.0000	#	1996		534,274,701	1.0012		
1962	*	241,468,538	1.000001	186	1.0000	#	1997		558,218,342	0.9990		
1963	*	254,177,408	1.000001	261	1.0000	#	1998		578,043,915	1.0000		
1964	*	267,555,166	1.000001	366	1.0000	#	1999		667,139,805	1.0000		
1965	*	281,637,017	1.000002	514	1.0000	#	2000		708,302,720	1.0042		
1966	*	296,460,018	1.000002	721	1.0000	#	2001		688,551,308	1.0022		
1967	*	312,063,177	1.000003	1,012	1.0000	#	2002		699,101,637	1.0094		
1968	*	328,487,555	1.000004	1,420	1.0000	#	2003		661,679,326	1.0125		
1969	*	345,776,373	1.000006	1,994	1.0000	#	2004		686,907,908	1.0129		
1970	*	363,975,130	1.000008	2,798	1.0000	#	2005		696,007,622	1.0159		
1971	*	383,131,716	1.000010	3,927	1.0000	#	2006		712,217,212	1.0399		
1972	*	403,296,543	1.000014	5,511	1.0001	#	2007		739,181,885	1.1189		
1973	*	424,522,677	1.000018	7,735	1.0001	#	2008		627,198,812	1.3976		
1974	*	446,865,975	1.000024	10,856	1.0001	#	2009		402,073,924	3.4222		
1975	*	470,385,237	1.000032	15,237	1.0001	#	2010		124,970,578			

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Medical 09v10

Latest 12/31 Prior to 1986 Incurred	1,507,461,919
Next Latest 12/31 Prior to 1986 Incurred	1,494,104,546
CY Development of Prior Yrs	13,357,373
Next Latest PY 1986 Incurred	322,157,360
# of 1986 Yrs in Prior Data	4.68
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0446 vs 1.0415 13,357,373
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF
1941	*	15,249,833	1.000000	1	1.0000 #	1976	*	193,357,891	1.000822	158,851	1.0033
1942	*	16,397,670	1.000000	1	1.0000 #	1977	*	207,911,711	1.001096	227,680	1.0044
1943	*	17,631,904	1.000000	1	1.0000 #	1978	*	223,560,979	1.001462	326,304	1.0059
1944	*	18,959,036	1.000000	2	1.0000 #	1979	*	240,388,150	1.001949	467,593	1.0078
1945	*	20,386,060	1.000000	2	1.0000 #	1980	*	258,481,882	1.002599	669,949	1.0104
1946	*	21,920,495	1.000000	3	1.0000 #	1981	*	277,937,507	1.003465	959,671	1.0139
1947	*	23,570,425	1.000000	5	1.0000 #	1982	*	298,857,534	1.004620	1,374,291	1.0186
1948	*	25,344,543	1.000000	7	1.0000 #	1983	*	321,352,188	1.006160	1,967,295	1.0249
1949	*	27,252,196	1.000000	9	1.0000 #	1984	*	345,539,987	1.008213	2,814,750	1.0333 25TH TO ULT
1950	*	29,303,437	1.000000	14	1.0000 #	1985	*	371,548,373	1.010950	4,024,556	1.0446 24TH TO ULT
1951	*	31,509,072	1.000001	19	1.0000 #	1986		329,493,683	1.0228		
1952	*	33,880,723	1.000001	28	1.0000 #	1987		433,512,994	1.0063		
1953	*	36,430,885	1.000001	40	1.0000 #	1988		525,749,385	1.0076		
1954	*	39,172,994	1.000001	57	1.0000 #	1989		638,810,990	1.0109		
1955	*	42,121,499	1.000002	82	1.0000 #	1990		666,552,410	1.0094	Total	
1956	*	45,291,935	1.000003	118	1.0000 #	1991		632,352,605	1.0062	Development:	
1957	*	48,701,005	1.000003	169	1.0000 #	1992		572,076,632	1.0091	13,357,373	
1958	*	52,366,672	1.000005	243	1.0000 #	1993		482,324,946	1.0098		
1959	*	56,308,249	1.000006	348	1.0000 #	1994		450,051,836	0.9985		
1960	*	60,546,505	1.000008	499	1.0000 #	1995		422,379,225	1.0030		
1961	*	65,103,769	1.000011	715	1.0000 #	1996		421,311,686	1.0074		
1962	*	70,004,052	1.000015	1,026	1.0001 #	1997		448,966,050	1.0040		
1963	*	75,273,174	1.000020	1,470	1.0001 #	1998		501,854,147	1.0100		
1964	*	80,938,897	1.000026	2,108	1.0001 #	1999		543,336,647	1.0068		
1965	*	87,031,072	1.000035	3,022	1.0001 #	2000		556,033,422	1.0122		
1966	*	93,581,798	1.000046	4,333	1.0002 #	2001		525,466,259	1.0067		
1967	*	100,625,589	1.000062	6,212	1.0002 #	2002		543,209,065	1.0127		
1968	*	108,199,559	1.000082	8,906	1.0003 #	2003		547,486,207	1.0148		
1969	*	116,343,611	1.000110	12,768	1.0004 #	2004		585,087,127	1.0230		
1970	*	125,100,657	1.000146	18,304	1.0006 #	2005		606,055,676	1.0108		
1971	*	134,516,836	1.000195	26,241	1.0008 #	2006		606,439,956	1.0234		
1972	*	144,641,759	1.000260	37,619	1.0010 #	2007		663,525,395	1.0261		
1973	*	155,528,773	1.000347	53,930	1.0014 #	2008		585,616,632	1.0823		
1974	*	167,235,240	1.000462	77,310	1.0019 #	2009		501,944,866	2.2298		
1975	*	179,822,839	1.000617	110,821	1.0025 #	2010		252,669,274			

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Indemnity: 08v09

Latest 12/31 Prior to 1986 Incurred	4,723,492,361
Next Latest 12/31 Prior to 1986 Incurred	4,720,082,988
CY Development of Prior Yrs	3,409,373
Next Latest PY 1986 Incurred	716,626,830
# of 1986 Yrs in Prior Data	6.59
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0051 vs 1.0048 3,409,373
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/09 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/09 Incurred	Prior Year Development	Dollar Development	DF
1940	*	76,689,254	1.000000	0	1.0000 #	1975	*	461,751,513	1.000072	33,073	1.0003
1941	*	80,725,530	1.000000	0	1.0000 #	1976	*	486,054,224	1.000096	46,417	1.0004
1942	*	84,974,242	1.000000	0	1.0000 #	1977	*	511,636,025	1.000127	65,144	1.0005
1943	*	89,446,571	1.000000	1	1.0000 #	1978	*	538,564,237	1.000170	91,427	1.0007
1944	*	94,154,285	1.000000	1	1.0000 #	1979	*	566,909,723	1.000226	128,311	1.0009
1945	*	99,109,774	1.000000	1	1.0000 #	1980	*	596,747,077	1.000302	180,072	1.0012
1946	*	104,326,078	1.000000	2	1.0000 #	1981	*	628,154,818	1.000402	252,707	1.0016
1947	*	109,816,924	1.000000	2	1.0000 #	1982	*	661,215,598	1.000537	354,630	1.0021
1948	*	115,596,762	1.000000	4	1.0000 #	1983	*	696,016,419	1.000715	497,637	1.0029 25TH TO ULT
1949	*	121,680,802	1.000000	5	1.0000 #	1984	*	732,648,862	1.000954	698,271	1.0038 24TH TO ULT.
1950	*	128,085,055	1.000000	7	1.0000 #	1985	*	771,209,328	1.001271982	979,718	1.0051 23RD TO ULT.
1951	*	134,826,374	1.000000	10	1.0000 #	1986		717,039,472	1.0006		
1952	*	141,922,499	1.000000	14	1.0000 #	1987		867,133,780	1.0003		
1953	*	149,392,104	1.000000	19	1.0000 #	1988		979,403,462	1.0006		
1954	*	157,254,846	1.000000	27	1.0000 #	1989		1,125,823,186	1.0001	Total	
1955	*	165,531,417	1.000000	38	1.0000 #	1990		1,158,349,805	1.0018	Development:	
1956	*	174,243,597	1.000000	53	1.0000 #	1991		1,010,036,500	1.0007	3,409,373	
1957	*	183,414,312	1.000000	74	1.0000 #	1992		854,493,305	0.9993		
1958	*	193,067,697	1.000001	104	1.0000 #	1993		736,668,141	1.0021		
1959	*	203,229,155	1.000001	146	1.0000 #	1994		675,497,186	1.0025		
1960	*	213,925,426	1.000001	205	1.0000 #	1995		579,777,152	1.0016		
1961	*	225,184,659	1.000001	287	1.0000 #	1996		497,857,135	1.0030		
1962	*	237,036,483	1.000002	403	1.0000 #	1997		520,524,155	1.0005		
1963	*	249,512,088	1.000002	566	1.0000 #	1998		550,315,412	1.0007		
1964	*	262,644,303	1.000003	795	1.0000 #	1999		639,711,732	1.0017		
1965	*	276,467,687	1.000004	1,115	1.0000 #	2000		668,707,016	1.0024		
1966	*	291,018,618	1.000005	1,565	1.0000 #	2001		641,480,690	1.0021		
1967	*	306,335,388	1.000007	2,197	1.0000 #	2002		654,218,207	1.0121		
1968	*	322,458,303	1.000010	3,083	1.0000 #	2003		623,011,834	1.0138		
1969	*	339,429,792	1.000013	4,327	1.0001 #	2004		639,977,707	1.0145		
1970	*	357,294,518	1.000017	6,073	1.0001 #	2005		653,699,997	1.0469		
1971	*	376,099,493	1.000023	8,524	1.0001 #	2006		652,929,123	1.1392		
1972	*	395,894,203	1.000030	11,963	1.0001 #	2007		629,348,058	1.4263		
1973	*	416,730,740	1.000040	16,790	1.0002 #	2008		424,835,135	3.4270		
1974	*	438,663,937	1.000054	23,565	1.0002 #	2009		113,070,766			

Inputs for Tail Factor Estimation - 2014 Loss Cost Filing

Medical 08v09

Latest 12/31 Prior to 1986 Incurred	1,461,552,784
Next Latest 12/31 Prior to 1986 Incurred	1,453,271,446
CY Development of Prior Yrs	8,281,338
Next Latest PY 1986 Incurred	314,873,818
# of 1986 Yrs in Prior Data	4.64
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
- 2 PY 1984 & Prior = Subsequent Yr x PY Deflation
- 3 1985 Development Selected Based on Observed 1986, 1987, 1988
- 4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0285 vs 1.0263 8,281,338
0

Pennsylvania Compensation Rating Bureau
Tail Factor Model - 2014 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/10 Incurred	Prior Year Development	Dollar Development	DF
1940	*	13,660,587	1.000000	0	1.0000 #	1975	*	173,207,282	1.000396	68,553	1.0016
1941	*	14,688,803	1.000000	0	1.0000 #	1976	*	186,244,390	1.000528	98,271	1.0021
1942	*	15,794,412	1.000000	0	1.0000 #	1977	*	200,262,785	1.000704	140,866	1.0028
1943	*	16,983,238	1.000000	1	1.0000 #	1978	*	215,336,328	1.000939	201,910	1.0038
1944	*	18,261,546	1.000000	1	1.0000 #	1979	*	231,544,438	1.001251	289,387	1.0050
1945	*	19,636,071	1.000000	1	1.0000 #	1980	*	248,972,514	1.001669	414,719	1.0067
1946	*	21,114,055	1.000000	2	1.0000 #	1981	*	267,712,381	1.002225	594,249	1.0089
1947	*	22,703,285	1.000000	3	1.0000 #	1982	*	287,862,775	1.002966	851,340	1.0119
1948	*	24,412,135	1.000000	4	1.0000 #	1983	*	309,529,866	1.003955	1,219,357	1.0159 25TH TO ULT
1949	*	26,249,607	1.000000	6	1.0000 #	1984	*	332,827,813	1.005273	1,745,889	1.0213 24TH TO ULT.
1950	*	28,225,384	1.000000	8	1.0000 #	1985	*	357,879,369	1.007031047	2,498,698	1.0285 23RD TO ULT.
1951	*	30,349,875	1.000000	12	1.0000 #	1986		316,426,282	1.0049		
1952	*	32,634,275	1.000001	17	1.0000 #	1987		420,441,984	1.0058		
1953	*	35,090,618	1.000001	25	1.0000 #	1988		504,475,364	1.0089		
1954	*	37,731,847	1.000001	36	1.0000 #	1989		609,332,150	1.0081	Total	
1955	*	40,571,879	1.000001	51	1.0000 #	1990		640,785,582	1.0017	Development:	
1956	*	43,625,676	1.000002	73	1.0000 #	1991		606,548,458	1.0119	8,281,338	
1957	*	46,909,329	1.000002	105	1.0000 #	1992		543,491,240	1.0113		
1958	*	50,440,139	1.000003	150	1.0000 #	1993		455,416,432	1.0093		
1959	*	54,236,708	1.000004	215	1.0000 #	1994		430,021,071	1.0120		
1960	*	58,319,041	1.000005	309	1.0000 #	1995		392,450,978	1.0107		
1961	*	62,708,647	1.000007	442	1.0000 #	1996		387,821,400	1.0092		
1962	*	67,428,652	1.000009	634	1.0000 #	1997		417,963,891	1.0127		
1963	*	72,503,927	1.000013	909	1.0001 #	1998		470,088,916	1.0081		
1964	*	77,961,212	1.000017	1,304	1.0001 #	1999		516,410,377	1.0035		
1965	*	83,829,260	1.000022	1,869	1.0001 #	2000		521,302,756	1.0015		
1966	*	90,138,989	1.000030	2,680	1.0001 #	2001		489,301,749	1.0078		
1967	*	96,923,645	1.000040	3,842	1.0002 #	2002		505,820,566	1.0149		
1968	*	104,218,973	1.000053	5,508	1.0002 #	2003		515,160,011	1.0152		
1969	*	112,063,411	1.000070	7,896	1.0003 #	2004		539,482,665	1.0050		
1970	*	120,498,292	1.000094	11,321	1.0004 #	2005		566,551,518	1.0194		
1971	*	129,568,056	1.000125	16,230	1.0005 #	2006		561,963,046	1.0495		
1972	*	139,320,490	1.000167	23,268	1.0007 #	2007		610,937,669	1.1105		
1973	*	149,806,979	1.000223	33,357	1.0009 #	2008		513,022,991	2.2144		
1974	*	161,082,773	1.000297	47,820	1.0012 #	2009		213,230,556			