

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 2006 vs. 2007, 2007 vs. 2008, 2008 vs. 2009 and 2009 vs. 2010 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 both the previous and revised approaches to the derivation of tail development factors. 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> Tail Factor	<u>MEDICAL</u> Tail Factor
09V10	23RD TO ULT.	1.0041	1.0699
08V09	23RD TO ULT.	1.0051	1.0285
07V08	23RD TO ULT.	1.0021	1.0368
06V07	23RD TO ULT.	0.9987	1.0295
AVERAGE OF LATEST 4 VALUATIONS		1.0025	1.0412

Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

Indemnity: 09v10

Latest 12/31 Prior to 1986 Incurred	4,768,295,550
Next Latest 12/31 Prior to 1986 Incurred	4,766,671,573
CY Development of Prior Yrs	1,623,977
Next Latest PY 1986 Incurred	721,208,637
# 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 = 1.0041 vs 1.0023 1,623,977  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 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
1940	*	77,555,738	1.000000	0	1.0000 #	1976	*	491,545,974	1.000045	22,102	1.0002
1941	*	81,637,619	1.000000	0	1.0000 #	1977	*	517,416,814	1.000060	31,019	1.0002
1942	*	85,934,335	1.000000	0	1.0000 #	1978	*	544,649,278	1.000080	43,535	1.0003
1943	*	90,457,195	1.000000	0	1.0000 #	1979	*	573,315,030	1.000107	61,100	1.0004
1944	*	95,218,100	1.000000	0	1.0000 #	1980	*	603,489,505	1.000142	85,752	1.0006
1945	*	100,229,579	1.000000	1	1.0000 #	1981	*	635,252,110	1.000189	120,347	1.0008
1946	*	105,504,820	1.000000	1	1.0000 #	1982	*	668,686,432	1.000253	168,898	1.0010
1947	*	111,057,705	1.000000	1	1.0000 #	1983	*	703,880,455	1.000337	237,030	1.0013
1948	*	116,902,848	1.000000	2	1.0000 #	1984	*	740,926,794	1.000449	332,636	1.0018
1949	*	123,055,629	1.000000	2	1.0000 #	1985	*	779,922,942	1.000598863	466,787	1.0024 24TH TO ULT.
1950	*	129,532,241	1.000000	3	1.0000 #	1986		722,419,920	1.0017		1.0041 23RD TO ULT.
1951	*	136,349,728	1.000000	5	1.0000 #	1987		874,117,794	0.9995		
1952	*	143,526,029	1.000000	6	1.0000 #	1988		996,003,920	1.0003		
1953	*	151,080,031	1.000000	9	1.0000 #	1989		1,150,653,517	0.9998	Total	
1954	*	159,031,611	1.000000	13	1.0000 #	1990		1,183,312,399	1.0002	Development:	
1955	*	167,401,696	1.000000	18	1.0000 #	1991		1,037,355,463	1.0026	1,623,977	
1956	*	176,212,312	1.000000	25	1.0000 #	1992		880,750,537	0.9989		
1957	*	185,486,644	1.000000	35	1.0000 #	1993		764,167,875	0.9998		
1958	*	195,249,099	1.000000	49	1.0000 #	1994		704,857,990	0.9994		
1959	*	205,525,367	1.000000	69	1.0000 #	1995		611,363,392	1.0006		
1960	*	216,342,492	1.000000	97	1.0000 #	1996		533,947,467	1.0012		
1961	*	227,728,939	1.000001	137	1.0000 #	1997		557,533,723	0.9990		
1962	*	239,714,672	1.000001	192	1.0000 #	1998		569,149,174	1.0001		
1963	*	252,331,234	1.000001	270	1.0000 #	1999		643,297,773	1.0000		
1964	*	265,611,825	1.000001	378	1.0000 #	2000		682,963,179	1.0043		
1965	*	279,591,395	1.000002	531	1.0000 #	2001		676,203,555	1.0023		
1966	*	294,306,732	1.000003	745	1.0000 #	2002		695,924,907	1.0095		
1967	*	309,796,560	1.000003	1,046	1.0000 #	2003		661,666,375	1.0125		
1968	*	326,101,642	1.000005	1,468	1.0000 #	2004		686,907,908	1.0129		
1969	*	343,264,886	1.000006	2,060	1.0000 #	2005		695,997,660	1.0159		
1970	*	361,331,459	1.000008	2,892	1.0000 #	2006		712,215,484	1.0399		
1971	*	380,348,904	1.000011	4,058	1.0000 #	2007		739,147,751	1.1189		
1972	*	400,367,268	1.000014	5,696	1.0001 #	2008		627,198,812	1.3976		
1973	*	421,439,229	1.000019	7,994	1.0001 #	2009		402,016,581	3.4222		
1974	*	443,620,241	1.000025	11,220	1.0001 #	2010		124,595,155			
1975	*	466,968,675	1.000034	15,748	1.0001 #						

Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

**Medical 09v10**

Latest 12/31 Prior to 1986 Incurred	1,493,274,537
Next Latest 12/31 Prior to 1986 Incurred	1,479,852,903
CY Development of Prior Yrs	13,421,634
Next Latest PY 1986 Incurred	318,181,210
# of 1986 Yrs in Prior Data	4.69
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 = 1.0699 vs 1.0422 13,421,634  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 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	*	14,029,689	1.000000	0	1.0000	#	1976	*	191,276,621	1.000835	159,630	1.0033
1941	*	15,085,687	1.000000	1	1.0000	#	1977	*	205,673,786	1.001114	228,797	1.0045
1942	*	16,221,169	1.000000	1	1.0000	#	1978	*	221,154,609	1.001485	327,902	1.0060
1943	*	17,442,117	1.000000	1	1.0000	#	1979	*	237,800,655	1.001980	469,879	1.0079
1944	*	18,754,964	1.000000	2	1.0000	#	1980	*	255,699,629	1.002640	673,218	1.0106
1945	*	20,166,628	1.000000	2	1.0000	#	1981	*	274,945,838	1.003520	964,341	1.0142
1946	*	21,684,547	1.000000	3	1.0000	#	1982	*	295,640,686	1.004693	1,380,953	1.0189
1947	*	23,316,717	1.000000	5	1.0000	#	1983	*	317,893,210	1.006257	1,976,782	1.0253
1948	*	25,071,739	1.000000	7	1.0000	#	1984	*	341,820,656	1.008343	2,828,234	1.0339
1949	*	26,958,859	1.000000	10	1.0000	#	1985	*	367,549,093	1.01124081	4,043,664	1.0454 24TH TO ULT.
1950	*	28,988,020	1.000000	14	1.0000	#	1986		325,642,571	1.0235		1.0699 23RD TO ULT.
1951	*	31,169,914	1.000001	20	1.0000	#	1987		427,908,187	1.0065		
1952	*	33,516,037	1.000001	28	1.0000	#	1988		521,333,365	1.0075		
1953	*	36,038,749	1.000001	40	1.0000	#	1989		635,491,427	1.0109	Total	
1954	*	38,751,343	1.000001	58	1.0000	#	1990		663,149,132	1.0094	Development:	
1955	*	41,668,111	1.000002	83	1.0000	#	1991		627,104,585	1.0060	13,421,634	
1956	*	44,804,420	1.000003	119	1.0000	#	1992		568,875,986	1.0091		
1957	*	48,176,796	1.000004	170	1.0000	#	1993		481,276,907	1.0099		
1958	*	51,803,007	1.000005	244	1.0000	#	1994		449,422,593	0.9984		
1959	*	55,702,158	1.000006	350	1.0000	#	1995		422,064,278	1.0030		
1960	*	59,894,793	1.000008	501	1.0000	#	1996		420,823,558	1.0074		
1961	*	64,403,003	1.000011	719	1.0000	#	1997		448,156,577	1.0040		
1962	*	69,250,541	1.000015	1,031	1.0001	#	1998		492,191,566	1.0080		
1963	*	74,462,948	1.000020	1,478	1.0001	#	1999		519,036,250	1.0066		
1964	*	80,067,685	1.000026	2,118	1.0001	#	2000		537,823,572	1.0124		
1965	*	86,094,285	1.000035	3,037	1.0001	#	2001		516,148,026	1.0069		
1966	*	92,574,501	1.000047	4,354	1.0002	#	2002		541,473,775	1.0128		
1967	*	99,542,474	1.000063	6,242	1.0003	#	2003		547,464,316	1.0148		
1968	*	107,034,918	1.000084	8,949	1.0003	#	2004		585,079,503	1.0230		
1969	*	115,091,310	1.000111	12,830	1.0004	#	2005		606,044,126	1.0108		
1970	*	123,754,096	1.000149	18,394	1.0006	#	2006		606,433,840	1.0234		
1971	*	133,068,921	1.000198	26,370	1.0008	#	2007		663,491,496	1.0261		
1972	*	143,084,861	1.000264	37,804	1.0011	#	2008		585,618,466	1.0823		
1973	*	153,854,689	1.000352	54,195	1.0014	#	2009		501,793,757	2.2300		
1974	*	165,435,150	1.000470	77,689	1.0019	#	2010		252,468,519			
1975	*	177,887,258	1.000626	111,365	1.0025	#						

Inputs for Tail Factor Estimation - 2012 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 - 2012 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
1949	*	121,680,802	1.000000	5	1.0000 #	1984	*	732,648,862	1.000954	698,271	1.0038
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 - 2012 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 - 2012 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
1949	*	26,249,607	1.000000	6	1.0000 #	1984	*	332,827,813	1.005273	1,745,889	1.0213
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			

Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

Indemnity: 07v08

Latest 12/31 Prior to 1986 Incurred	4,823,613,335
Next Latest 12/31 Prior to 1986 Incurred	4,821,729,417
CY Development of Prior Yrs	1,883,918
Next Latest PY 1986 Incurred	730,672,424
# of 1986 Yrs in Prior Data	6.60
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 = 1.0021 vs 1.0026 1,883,918  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/08 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/08 Incurred	Prior Year Development	Dollar Development	DF
1941	*	82,544,574	1.000000	0	1.0000 #	1975	*	472,156,476	1.000039	18,269	1.0002
1942	*	86,889,025	1.000000	0	1.0000 #	1976	*	497,006,817	1.000052	25,640	1.0002
1943	*	91,462,132	1.000000	0	1.0000 #	1977	*	523,165,071	1.000069	35,986	1.0003
1944	*	96,275,928	1.000000	0	1.0000 #	1978	*	550,700,074	1.000092	50,505	1.0004
1945	*	101,343,082	1.000000	1	1.0000 #	1979	*	579,684,289	1.000122	70,883	1.0005
1946	*	106,676,929	1.000000	1	1.0000 #	1980	*	610,193,988	1.000163	99,480	1.0007
1947	*	112,291,504	1.000000	1	1.0000 #	1981	*	642,309,461	1.000217	139,614	1.0009
1948	*	118,201,583	1.000000	2	1.0000 #	1982	*	676,115,222	1.000290	195,935	1.0012
1949	*	124,422,719	1.000000	3	1.0000 #	1983	*	711,700,234	1.000387	274,971	1.0015
1950	*	130,971,283	1.000000	4	1.0000 #	1984	*	749,158,141	1.000515	385,874	1.0021 23RD TO ULT
1951	*	137,864,509	1.000000	5	1.0000 #	1985	*	788,587,517	1.0006871227	541,484	1.0028 22ND TO ULT.
1952	*	145,120,536	1.000000	8	1.0000 #	1986		729,365,680	0.9982		
1953	*	152,758,459	1.000000	11	1.0000 #	1987		885,407,408	1.0006		
1954	*	160,798,377	1.000000	15	1.0000 #	1988		1,006,570,459	1.0002		
1955	*	169,261,450	1.000000	21	1.0000 #	1989		1,164,088,392	1.0015	Total	
1956	*	178,169,947	1.000000	29	1.0000 #	1990		1,191,295,662	1.0000	Development:	
1957	*	187,547,313	1.000000	41	1.0000 #	1991		1,049,568,925	1.0012	1,883,918	
1958	*	197,418,224	1.000000	57	1.0000 #	1992		896,325,114	1.0007		
1959	*	207,808,657	1.000000	81	1.0000 #	1993		771,091,629	1.0016		
1960	*	218,745,955	1.000001	113	1.0000 #	1994		709,821,060	1.0019		
1961	*	230,258,900	1.000001	159	1.0000 #	1995		616,311,682	1.0025		
1962	*	242,377,789	1.000001	223	1.0000 #	1996		534,720,552	0.9998		
1963	*	255,134,515	1.000001	313	1.0000 #	1997		562,718,687	1.0006		
1964	*	268,562,647	1.000002	439	1.0000 #	1998		586,919,103	0.9933		
1965	*	282,697,523	1.000002	616	1.0000 #	1999		669,590,595	1.0009		
1966	*	297,576,340	1.000003	865	1.0000 #	2000		706,572,308	1.0000		
1967	*	313,238,253	1.000004	1,213	1.0000 #	2001		685,847,135	1.0016		
1968	*	329,724,477	1.000005	1,703	1.0000 #	2002		683,448,332	1.0185		
1969	*	347,078,397	1.000007	2,390	1.0000 #	2003		644,770,809	1.0385		
1970	*	365,345,681	1.000009	3,355	1.0000 #	2004		664,194,830	1.0701		
1971	*	384,574,401	1.000012	4,708	1.0000 #	2005		648,604,553	1.1634		
1972	*	404,815,159	1.000016	6,608	1.0001 #	2006		596,426,891	1.4728		
1973	*	426,121,220	1.000022	9,275	1.0001 #	2007		460,887,927	3.3570		
1974	*	448,548,652	1.000029	13,017	1.0001 #	2008		130,532,565			



Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

Medical 07v08

Latest 12/31 Prior to 1986 Incurred	1,489,000,219
Next Latest 12/31 Prior to 1986 Incurred	1,474,478,859
CY Development of Prior Yrs	14,521,360
Next Latest PY 1986 Incurred	320,233,212
# of 1986 Yrs in Prior Data	4.65
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 = 1.0368 vs 1.0453 14,521,360  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/08 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/08 Incurred	Prior Year Development	Dollar Development	DF
1941	*	15,027,953	1.000000	1	1.0000 #	1975	*	177,206,468	1.000681	120,557	1.0027
1942	*	16,159,089	1.000000	1	1.0000 #	1976	*	190,544,589	1.000908	172,802	1.0036
1943	*	17,375,364	1.000000	1	1.0000 #	1977	*	204,886,655	1.001210	247,670	1.0049
1944	*	18,683,188	1.000000	2	1.0000 #	1978	*	220,308,231	1.001614	354,939	1.0065
1945	*	20,089,449	1.000000	2	1.0000 #	1979	*	236,890,571	1.002152	508,600	1.0086
1946	*	21,601,558	1.000000	4	1.0000 #	1980	*	254,721,044	1.002869	728,654	1.0115
1947	*	23,227,482	1.000000	5	1.0000 #	1981	*	273,893,596	1.003825	1,043,670	1.0154
1948	*	24,975,787	1.000000	7	1.0000 #	1982	*	294,509,243	1.005100	1,494,403	1.0206
1949	*	26,855,685	1.000000	10	1.0000 #	1983	*	316,676,606	1.006800	2,138,895	1.0275
1950	*	28,877,080	1.000001	15	1.0000 #	1984	*	340,512,479	1.009067	3,059,628	1.0368 23RD TO ULT.
1951	*	31,050,624	1.000001	21	1.0000 #	1985	*	366,142,451	1.0120891080	4,373,464	1.0494 22ND TO ULT.
1952	*	33,387,768	1.000001	30	1.0000 #	1986		321,338,380	1.0035		
1953	*	35,900,826	1.000001	44	1.0000 #	1987		429,883,710	1.0033		
1954	*	38,603,038	1.000002	63	1.0000 #	1988		518,782,942	1.0121		
1955	*	41,508,643	1.000002	90	1.0000 #	1989		630,672,362	1.0071	Total	
1956	*	44,632,950	1.000003	128	1.0000 #	1990		660,591,177	1.0068	Development:	
1957	*	47,992,419	1.000004	184	1.0000 #	1991		625,784,460	1.0074	14,521,360	
1958	*	51,604,752	1.000005	264	1.0000 #	1992		565,613,825	1.0074		
1959	*	55,488,981	1.000007	379	1.0000 #	1993		475,205,952	1.0025		
1960	*	59,665,571	1.000009	543	1.0000 #	1994		450,643,640	1.0166		
1961	*	64,156,527	1.000012	778	1.0000 #	1995		420,157,331	1.0076		
1962	*	68,985,513	1.000016	1,116	1.0001 #	1996		415,458,474	1.0020		
1963	*	74,177,971	1.000022	1,600	1.0001 #	1997		445,640,747	1.0088		
1964	*	79,761,260	1.000029	2,293	1.0001 #	1998		502,382,124	1.0041		
1965	*	85,764,795	1.000038	3,288	1.0002 #	1999		539,604,296	1.0084		
1966	*	92,220,210	1.000051	4,714	1.0002 #	2000		556,380,158	1.0039		
1967	*	99,161,516	1.000068	6,758	1.0003 #	2001		517,817,894	1.0106		
1968	*	106,625,286	1.000091	9,688	1.0004 #	2002		527,653,955	1.0033		
1969	*	114,650,845	1.000121	13,890	1.0005 #	2003		530,585,927	1.0072		
1970	*	123,280,479	1.000162	19,913	1.0006 #	2004		565,590,827	1.0049		
1971	*	132,559,655	1.000215	28,548	1.0009 #	2005		582,326,632	1.0366		
1972	*	142,537,263	1.000287	40,926	1.0011 #	2006		561,217,472	1.1110		
1973	*	153,265,874	1.000383	58,669	1.0015 #	2007		581,053,682	2.2194		
1974	*	164,802,015	1.000511	84,103	1.0020 #	2008		242,952,032			

Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

Indemnity: 06v07

Latest 12/31 Prior to 1986 Incurred	4,520,085,294
Next Latest 12/31 Prior to 1986 Incurred	4,521,571,057
CY Development of Prior Yrs	-1,485,763
Next Latest PY 1986 Incurred	691,536,001
# of 1986 Yrs in Prior Data	6.54
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 = .9987 vs .9979 -1,485,763  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/07 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/07 Incurred	Prior Year Development	Dollar Development	DF
1940	*	74,566,567	1.000000	0	1.0000 #	1974	*	426,522,132	.999976	-10,258	.9999
1941	*	78,491,124	1.000000	0	1.0000 #	1975	*	448,970,665	.999968	-14,398	.9999
1942	*	82,622,235	1.000000	0	1.0000 #	1976	*	472,600,701	.999957	-20,208	.9998
1943	*	86,970,774	1.000000	0	1.0000 #	1977	*	497,474,422	.999943	-28,362	.9998
1944	*	91,548,183	1.000000	0	1.0000 #	1978	*	523,657,286	.999924	-39,807	.9997
1945	*	96,366,509	1.000000	-1	1.0000 #	1979	*	551,218,196	.999899	-55,871	.9996
1946	*	101,438,430	1.000000	-1	1.0000 #	1980	*	580,229,680	.999865	-78,418	.9995
1947	*	106,777,295	1.000000	-1	1.0000 #	1981	*	610,768,084	.999820	-110,066	.9993
1948	*	112,397,153	1.000000	-2	1.0000 #	1982	*	642,913,772	.999760	-154,488	.9990
1949	*	118,312,792	1.000000	-2	1.0000 #	1983	*	676,751,339	.999680	-216,842	.9987 23RD TO ULT.
1950	*	124,539,781	1.000000	-3	1.0000 #	1984	*	712,369,831	.999573	-304,373	.9983 22ND TO ULT.
1951	*	131,094,507	1.000000	-4	1.0000 #	1985	*	749,862,980	.9994305530	-427,251	.9977 21ST TO ULT.
1952	*	137,994,217	1.000000	-6	1.0000 #	1986		693,800,732	1.0033		
1953	*	145,257,071	1.000000	-8	1.0000 #	1987		838,838,311	1.0012		
1954	*	152,902,180	1.000000	-12	1.0000 #	1988		959,980,281	1.0010	Total	
1955	*	160,949,663	1.000000	-16	1.0000 #	1989		1,113,719,865	1.0026	Development:	
1956	*	169,420,698	1.000000	-23	1.0000 #	1990		1,148,748,610	1.0082	-1,485,763	
1957	*	178,337,577	1.000000	-32	1.0000 #	1991		1,016,226,446	1.0064		
1958	*	187,723,765	1.000000	-45	1.0000 #	1992		881,157,810	1.0040		
1959	*	197,603,963	1.000000	-64	1.0000 #	1993		765,597,656	1.0000		
1960	*	208,004,172	1.000000	-89	1.0000 #	1994		700,623,961	1.0013		
1961	*	218,951,760	.999999	-125	1.0000 #	1995		612,378,283	0.9916		
1962	*	230,475,537	.999999	-176	1.0000 #	1996		526,287,216	1.0006		
1963	*	242,605,828	.999999	-246	1.0000 #	1997		556,415,795	1.0035		
1964	*	255,374,556	.999999	-346	1.0000 #	1998		585,357,536	1.0106		
1965	*	268,815,322	.999998	-485	1.0000 #	1999		663,535,830	0.9977		
1966	*	282,963,497	.999998	-681	1.0000 #	2000		700,642,782	1.0069		
1967	*	297,856,313	.999997	-956	1.0000 #	2001		666,909,293	1.0114		
1968	*	313,532,961	.999996	-1,342	1.0000 #	2002		654,229,371	1.0338		
1969	*	330,034,695	.999994	-1,884	1.0000 #	2003		614,220,984	1.0676		
1970	*	347,404,942	.999992	-2,644	1.0000 #	2004		617,044,713	1.1531		
1971	*	365,689,413	.999990	-3,710	1.0000 #	2005		552,223,744	1.4602		
1972	*	384,936,224	.999986	-5,208	.9999 #	2006		400,301,692	3.3234		
1973	*	405,196,026	.999982	-7,309	.9999 #	2007		136,763,184			

Inputs for Tail Factor Estimation - 2012 Loss Cost Filing

Medical **06v07**

Latest 12/31 Prior to 1986 Incurred	1,372,850,870
Next Latest 12/31 Prior to 1986 Incurred	1,358,187,617
CY Development of Prior Yrs	14,663,253
Next Latest PY 1986 Incurred	303,061,205
# of 1986 Yrs in Prior Data	4.53
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 = 1.0295 vs 1.0484 14,663,253  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2012 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/07 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/07 Incurred	Prior Year Development	Dollar Development	DF
1940	*	13,190,262	1.000000	0	1.0000 #	1974	*	155,536,805	1.000547	84,967	1.0022
1941	*	14,183,077	1.000000	1	1.0000 #	1975	*	167,243,876	1.000729	121,794	1.0029
1942	*	15,250,621	1.000000	1	1.0000 #	1976	*	179,832,125	1.000972	174,572	1.0039
1943	*	16,398,517	1.000000	1	1.0000 #	1977	*	193,367,876	1.001296	250,202	1.0052
1944	*	17,632,814	1.000000	2	1.0000 #	1978	*	207,922,447	1.001727	358,558	1.0069
1945	*	18,960,015	1.000000	2	1.0000 #	1979	*	223,572,524	1.002303	513,766	1.0092
1946	*	20,387,113	1.000000	4	1.0000 #	1980	*	240,400,564	1.003071	736,019	1.0123
1947	*	21,921,627	1.000000	5	1.0000 #	1981	*	258,495,230	1.004095	1,054,148	1.0165
1948	*	23,571,642	1.000000	7	1.0000 #	1982	*	277,951,860	1.005460	1,509,272	1.0220
1949	*	25,345,852	1.000000	10	1.0000 #	1983	*	298,872,968	1.007279	2,159,922	1.0295 23RD TO ULT.
1950	*	27,253,604	1.000001	15	1.0000 #	1984	*	321,368,782	1.009706	3,089,220	1.0395 22ND TO ULT.
1951	*	29,304,950	1.000001	21	1.0000 #	1985	*	345,557,830	1.0129413270	4,414,843	1.0529 21ST TO ULT.
1952	*	31,510,699	1.000001	31	1.0000 #	1986	*	303,221,174	1.0005		
1953	*	33,882,472	1.000001	44	1.0000 #	1987	*	407,533,405	1.0100		
1954	*	36,432,766	1.000002	63	1.0000 #	1988	*	487,850,452	1.0078	Total	
1955	*	39,175,017	1.000002	91	1.0000 #	1989	*	599,173,701	1.0095	Development:	
1956	*	42,123,674	1.000003	130	1.0000 #	1990	*	630,520,109	1.0098	14,663,253	
1957	*	45,294,274	1.000004	186	1.0000 #	1991	*	601,169,478	1.0135		
1958	*	48,703,520	1.000005	267	1.0000 #	1992	*	552,592,157	1.0127		
1959	*	52,369,376	1.000007	383	1.0000 #	1993	*	470,416,175	1.0112		
1960	*	56,311,157	1.000010	548	1.0000 #	1994	*	437,260,586	1.0105		
1961	*	60,549,631	1.000013	786	1.0001 #	1995	*	413,711,051	1.0134		
1962	*	65,107,131	1.000017	1,127	1.0001 #	1996	*	407,625,675	1.0079		
1963	*	70,007,667	1.000023	1,616	1.0001 #	1997	*	436,063,662	1.0107		
1964	*	75,277,062	1.000031	2,317	1.0001 #	1998	*	494,960,370	1.0220		
1965	*	80,943,077	1.000041	3,322	1.0002 #	1999	*	530,666,833	1.0164		
1966	*	87,035,567	1.000055	4,762	1.0002 #	2000	*	550,053,483	1.0208		
1967	*	93,586,631	1.000073	6,828	1.0003 #	2001	*	502,594,617	1.0095		
1968	*	100,630,786	1.000097	9,788	1.0004 #	2002	*	516,812,549	1.0207		
1969	*	108,205,146	1.000130	14,033	1.0005 #	2003	*	520,053,192	1.0272		
1970	*	116,349,619	1.000173	20,118	1.0007 #	2004	*	559,612,453	1.0407		
1971	*	125,107,118	1.000231	28,842	1.0009 #	2005	*	557,322,336	1.0915		
1972	*	134,523,782	1.000307	41,347	1.0012 #	2006	*	501,174,144	2.2568		
1973	*	144,649,228	1.000410	59,272	1.0016 #	2007	*	259,314,490			