

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 2004 vs. 2005 valuations in the tail factor calculation will use policy year 1985 as the earliest separate policy year and an aggregate line of experience for policy years 1984 and prior. The 2005 vs. 2006, 2006 vs. 2007 and 2007 vs. 2008 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
07V08	21ST TO ULT.	1.0089	1.0494
06V07	21ST TO ULT.	0.9977	1.0529
05V06	21ST TO ULT.	1.0034	1.0550
04V05	21ST TO ULT.	1.0066	1.0496
AVERAGE OF LATEST 4 VALUATIONS		1.0042	1.0517

Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

Indemnity: 07v08

Latest 12/31 Prior to 1986 Incurred	4,524,590,910
Next Latest 12/31 Prior to 1986 Incurred	4,517,816,330
CY Development of Prior Yrs	6,774,580
Next Latest PY 1986 Incurred	693,338,906
# of 1986 Yrs in Prior Data	6.53
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 = 1.0089 vs 1.0098 6,774,580  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 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
1939	*	70,773,947	1.000000	0	1.0000 #	1974	*	426,135,022	1.000110	46,860	1.0004
1940	*	74,498,891	1.000000	0	1.0000 #	1975	*	448,563,182	1.000147	65,766	1.0006
1941	*	78,419,885	1.000000	1	1.0000 #	1976	*	472,171,770	1.000196	92,299	1.0008
1942	*	82,547,248	1.000000	1	1.0000 #	1977	*	497,022,916	1.000261	129,534	1.0010
1943	*	86,891,840	1.000000	1	1.0000 #	1978	*	523,182,017	1.000348	181,786	1.0014
1944	*	91,465,094	1.000000	2	1.0000 #	1979	*	550,717,912	1.000463	255,109	1.0019
1945	*	96,279,047	1.000000	3	1.0000 #	1980	*	579,703,066	1.000618	357,992	1.0025
1946	*	101,346,365	1.000000	4	1.0000 #	1981	*	610,213,753	1.000824	502,342	1.0033
1947	*	106,680,384	1.000000	5	1.0000 #	1982	*	642,330,267	1.001099	704,848	1.0044
1948	*	112,295,141	1.000000	7	1.0000 #	1983	*	676,137,123	1.001465	988,899	1.0059
1949	*	118,205,412	1.000000	10	1.0000 #	1984	*	711,723,287	1.001953	1,387,251	1.0078
1950	*	124,426,749	1.000000	14	1.0000 #	1985	*	749,182,407	1.002603935	1,945,755	1.0105
1951	*	130,975,526	1.000000	19	1.0000 #	1986	*	692,292,670	0.9985		1.0089
1952	*	137,868,974	1.000000	27	1.0000 #	1987	*	839,087,134	1.0010		
1953	*	145,125,236	1.000000	38	1.0000 #	1988	*	958,977,229	1.0003	Total	
1954	*	152,763,407	1.000000	53	1.0000 #	1989	*	1,113,633,692	1.0017	Development:	
1955	*	160,803,586	1.000000	75	1.0000 #	1990	*	1,142,303,050	0.9955	6,774,580	
1956	*	169,266,933	1.000001	105	1.0000 #	1991	*	1,014,869,377	1.0012		
1957	*	178,175,718	1.000001	147	1.0000 #	1992	*	881,792,053	1.0009		
1958	*	187,553,388	1.000001	207	1.0000 #	1993	*	766,693,875	1.0014		
1959	*	197,424,619	1.000001	290	1.0000 #	1994	*	701,867,510	1.0020		
1960	*	207,815,388	1.000002	407	1.0000 #	1995	*	611,768,245	1.0025		
1961	*	218,753,040	1.000003	572	1.0000 #	1996	*	526,079,251	1.0001		
1962	*	230,266,358	1.000003	802	1.0000 #	1997	*	556,608,711	1.0006		
1963	*	242,385,640	1.000005	1,126	1.0000 #	1998	*	581,392,136	0.9932		
1964	*	255,142,779	1.000006	1,580	1.0000 #	1999	*	664,140,210	1.0009		
1965	*	268,571,346	1.000008	2,218	1.0000 #	2000	*	700,624,746	1.0000		
1966	*	282,706,680	1.000011	3,113	1.0000 #	2001	*	668,639,335	1.0026		
1967	*	297,585,979	1.000015	4,369	1.0001 #	2002	*	666,149,966	1.0182		
1968	*	313,248,399	1.000020	6,131	1.0001 #	2003	*	638,004,775	1.0387		
1969	*	329,735,157	1.000026	8,605	1.0001 #	2004	*	659,687,609	1.0710		
1970	*	347,089,639	1.000035	12,077	1.0001 #	2005	*	644,192,556	1.1684		
1971	*	365,357,515	1.000046	16,951	1.0002 #	2006	*	591,136,129	1.4773		
1972	*	384,586,858	1.000062	23,790	1.0002 #	2007	*	458,297,203	3.3554		
1973	*	404,828,271	1.000082	33,389	1.0003 #	2008	*	129,675,041			

Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

**Medical 07v08**

Latest 12/31 Prior to 1986 Incurred	1,385,204,795
Next Latest 12/31 Prior to 1986 Incurred	1,372,151,193
CY Development of Prior Yrs	13,053,602
Next Latest PY 1986 Incurred	302,970,501
# of 1986 Yrs in Prior Data	4.57
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 = 1.0494 vs 1.0431 13,053,602  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 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	
1939	*	12,330,791	1.000000	0	1.0000	#	1974	*	156,346,347	1.000484	75,574	1.0019
1940	*	13,258,915	1.000000	0	1.0000	#	1975	*	168,114,351	1.000645	108,332	1.0026
1941	*	14,256,898	1.000000	1	1.0000	#	1976	*	180,768,120	1.000860	155,281	1.0034
1942	*	15,329,998	1.000000	1	1.0000	#	1977	*	194,374,322	1.001146	222,561	1.0046
1943	*	16,483,869	1.000000	1	1.0000	#	1978	*	209,004,647	1.001528	318,963	1.0061
1944	*	17,724,590	1.000000	2	1.0000	#	1979	*	224,736,180	1.002038	457,061	1.0082
1945	*	19,058,699	1.000000	2	1.0000	#	1980	*	241,651,807	1.002717	654,841	1.0109
1946	*	20,493,224	1.000000	3	1.0000	#	1981	*	259,840,652	1.003623	937,993	1.0146
1947	*	22,035,725	1.000000	5	1.0000	#	1982	*	279,398,551	1.004831	1,343,177	1.0195
1948	*	23,694,328	1.000000	6	1.0000	#	1983	*	300,428,549	1.006441	1,922,621	1.0260
1949	*	25,477,772	1.000000	9	1.0000	#	1984	*	323,041,451	1.008588	2,750,578	1.0349
1950	*	27,395,454	1.000000	13	1.0000	#	1985	*	347,356,399	1.011450335	3,932,321	1.0467
1951	*	29,457,477	1.000001	19	1.0000	#	1986	*	303,756,480	1.0026		22ND TO ULT.
1952	*	31,674,707	1.000001	27	1.0000	#	1987	*	408,197,343	1.0030	1.0494	21ST TO ULT.
1953	*	34,058,825	1.000001	39	1.0000	#	1988	*	492,889,738	1.0124	Total	
1954	*	36,622,392	1.000002	56	1.0000	#	1989	*	603,477,916	1.0085	Development:	
1955	*	39,378,916	1.000002	81	1.0000	#	1990	*	633,748,302	1.0063	13,053,602	
1956	*	42,342,921	1.000003	115	1.0000	#	1991	*	604,489,371	1.0078		
1957	*	45,530,022	1.000004	166	1.0000	#	1992	*	556,564,145	1.0074		
1958	*	48,957,013	1.000005	237	1.0000	#	1993	*	471,622,930	1.0025		
1959	*	52,641,950	1.000006	340	1.0000	#	1994	*	444,642,331	1.0171		
1960	*	56,604,247	1.000009	488	1.0000	#	1995	*	415,601,503	1.0077		
1961	*	60,864,782	1.000011	699	1.0000	#	1996	*	408,058,062	1.0017		
1962	*	65,446,002	1.000015	1,003	1.0001	#	1997	*	439,881,920	1.0089		
1963	*	70,372,045	1.000020	1,437	1.0001	#	1998	*	496,981,827	1.0041		
1964	*	75,668,866	1.000027	2,061	1.0001	#	1999	*	534,469,929	1.0072		
1965	*	81,364,372	1.000036	2,954	1.0001	#	2000	*	552,164,138	1.0038		
1966	*	87,488,572	1.000048	4,236	1.0002	#	2001	*	507,897,114	1.0105		
1967	*	94,073,733	1.000065	6,072	1.0003	#	2002	*	518,658,665	1.0036		
1968	*	101,154,551	1.000086	8,706	1.0003	#	2003	*	524,051,079	1.0076		
1969	*	108,768,335	1.000115	12,481	1.0005	#	2004	*	561,695,860	1.0061		
1970	*	116,955,199	1.000153	17,893	1.0006	#	2005	*	576,630,872	1.0362		
1971	*	125,758,278	1.000204	25,652	1.0008	#	2006	*	556,442,418	1.1119		
1972	*	135,223,955	1.000272	36,775	1.0011	#	2007	*	576,640,415	2.2229		
1973	*	145,402,102	1.000363	52,719	1.0015	#	2008	*	241,042,409			

Inputs for Tail Factor Estimation - 2010 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 = .9977 vs .9979 -1,485,763  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 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
1950	*	124,539,781	1.000000	-3	1.0000 #	1984	*	712,369,831	.999573	-304,373	.9983
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 - 2010 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 = 1.0529 vs 1.0484 14,663,253  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 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
1950	*	27,253,604	1.000001	15	1.0000	#	1984	*	321,368,782	1.009706	3,089,220	1.0395
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			

Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

Indemnity: 05v06

Latest 12/31 Prior to 1986 Incurred	4,540,203,598	
Next Latest 12/31 Prior to 1986 Incurred	4,537,284,525	1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
CY Development of Prior Yrs	2,919,073	2 PY 1984 & Prior = Subsequent Yr x PY Deflation
Next Latest PY 1986 Incurred	697,208,437	3 1985 Development Selected Based on Observed 1986, 1987, 1988
# of 1986 Yrs in Prior Data	6.51	4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0
Selected Decrement, Development Factor	0.75	
Selected Average PY Deflation Factor	0.95	

TAIL = 1.0045 vs 1.0042 2,919,073  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/06 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/06 Incurred	Prior Year Development	Dollar Development	DF	
1939	*	71,078,204	1.000000	0	1.0000	#	1973	*	406,568,630	1.000035	14,374	1.0001
1940	*	74,819,162	1.000000	0	1.0000	#	1974	*	427,966,979	1.000047	20,174	1.0002
1941	*	78,757,013	1.000000	0	1.0000	#	1975	*	450,491,557	1.000063	28,314	1.0003
1942	*	82,902,119	1.000000	0	1.0000	#	1976	*	474,201,639	1.000084	39,738	1.0003
1943	*	87,265,388	1.000000	1	1.0000	#	1977	*	499,159,620	1.000112	55,772	1.0004
1944	*	91,858,303	1.000000	1	1.0000	#	1978	*	525,431,179	1.000149	78,273	1.0006
1945	*	96,692,951	1.000000	1	1.0000	#	1979	*	553,085,451	1.000199	109,851	1.0008
1946	*	101,782,054	1.000000	2	1.0000	#	1980	*	582,195,212	1.000265	154,167	1.0011
1947	*	107,139,004	1.000000	2	1.0000	#	1981	*	612,837,065	1.000353	216,356	1.0014
1948	*	112,777,899	1.000000	3	1.0000	#	1982	*	645,091,647	1.000471	303,621	1.0019
1949	*	118,713,578	1.000000	4	1.0000	#	1983	*	679,043,839	1.000628	426,069	1.0025
1950	*	124,961,661	1.000000	6	1.0000	#	1984	*	714,782,989	1.000837	597,866	1.0034
1951	*	131,538,590	1.000000	8	1.0000	#	1985	*	752,403,146	1.00111617	838,876	1.0045
1952	*	138,461,674	1.000000	12	1.0000	#	1986	*	695,237,353	0.9972		
1953	*	145,749,130	1.000000	16	1.0000	#	1987	*	842,349,548	1.0010	Total	
1954	*	153,420,137	1.000000	23	1.0000	#	1988	*	963,476,188	0.9991	Development:	
1955	*	161,494,881	1.000000	32	1.0000	#	1989	*	1,117,268,182	1.0009	2,919,073	
1956	*	169,994,612	1.000000	45	1.0000	#	1990	*	1,146,603,178	1.0015		
1957	*	178,941,697	1.000000	63	1.0000	#	1991	*	1,016,455,952	0.9993		
1958	*	188,359,681	1.000000	89	1.0000	#	1992	*	881,816,911	1.0007		
1959	*	198,273,348	1.000001	125	1.0000	#	1993	*	768,680,423	0.9988		
1960	*	208,708,787	1.000001	175	1.0000	#	1994	*	702,895,888	0.9991		
1961	*	219,693,460	1.000001	246	1.0000	#	1995	*	619,067,825	1.0138		
1962	*	231,256,274	1.000001	345	1.0000	#	1996	*	527,262,064	1.0059		
1963	*	243,427,657	1.000002	485	1.0000	#	1997	*	556,001,271	1.0061		
1964	*	256,239,639	1.000003	680	1.0000	#	1998	*	580,107,647	1.0061		
1965	*	269,725,936	1.000004	955	1.0000	#	1999	*	667,120,254	1.0062		
1966	*	283,922,038	1.000005	1,340	1.0000	#	2000	*	698,572,354	1.0052		
1967	*	298,865,303	1.000006	1,881	1.0000	#	2001	*	660,373,911	1.0223		
1968	*	314,595,056	1.000008	2,639	1.0000	#	2002	*	633,659,281	1.0548		
1969	*	331,152,690	1.000011	3,705	1.0000	#	2003	*	576,608,613	1.1656		
1970	*	348,581,779	1.000015	5,199	1.0001	#	2004	*	535,732,411	1.4119		
1971	*	366,928,188	1.000020	7,297	1.0001	#	2005	*	379,313,306	3.0844		
1972	*	386,240,198	1.000027	10,242	1.0001	#	2006	*	120,639,505			



Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

Medical 05v06

Latest 12/31 Prior to 1986 Incurred	1,363,971,912	
Next Latest 12/31 Prior to 1986 Incurred	1,343,731,732	1 Policy Yr 1985 Incurred = Average of 1986, 1987, 1988, reduced by PY Deflation ^ 2
CY Development of Prior Yrs	20,240,180	2 PY 1984 & Prior = Subsequent Yr x PY Deflation
Next Latest PY 1986 Incurred	301,204,176	3 1985 Development Selected Based on Observed 1986, 1987, 1988
# of 1986 Yrs in Prior Data	4.53	4 PY 1984 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0
Selected Decrement, Development Factor	0.75	
Selected Average PY Deflation Factor	0.93	

TAIL = 1.0739 vs 1.0672 20,240,180  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/06 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/06 Incurred	Prior Year Development	Dollar Development	DF	
1939	*	12,272,884	1.000000	0	1.0000	#	1973	*	144,719,270	1.000567	82,057	1.0023
1940	*	13,196,649	1.000000	1	1.0000	#	1974	*	155,612,118	1.000756	117,623	1.0030
1941	*	14,189,945	1.000000	1	1.0000	#	1975	*	167,324,858	1.001009	168,592	1.0040
1942	*	15,258,006	1.000000	1	1.0000	#	1976	*	179,919,202	1.001345	241,628	1.0054
1943	*	16,406,458	1.000000	2	1.0000	#	1977	*	193,461,508	1.001793	346,265	1.0072
1944	*	17,641,352	1.000000	2	1.0000	#	1978	*	208,023,127	1.002391	496,141	1.0096
1945	*	18,969,196	1.000000	3	1.0000	#	1979	*	223,680,782	1.003188	710,749	1.0128
1946	*	20,396,985	1.000000	5	1.0000	#	1980	*	240,516,969	1.004250	1,017,916	1.0171
1947	*	21,932,242	1.000000	7	1.0000	#	1981	*	258,620,397	1.005667	1,457,323	1.0229
1948	*	23,583,056	1.000000	10	1.0000	#	1982	*	278,086,449	1.007556	2,085,434	1.0306
1949	*	25,358,124	1.000001	14	1.0000	#	1983	*	299,017,687	1.010075	2,982,415	1.0410
1950	*	27,266,800	1.000001	21	1.0000	#	1984	*	321,524,394	1.013433	4,261,695	1.0550
1951	*	29,319,140	1.000001	30	1.0000	#	1985	*	345,725,155	1.017910	6,083,080	1.0739
1952	*	31,525,957	1.000001	43	1.0000	#	1986		305,487,715	1.0142		
1953	*	33,898,879	1.000002	61	1.0000	#	1987		406,243,874	1.0144	Total	
1954	*	36,450,407	1.000002	87	1.0000	#	1988		487,453,826	1.0086	Development:	
1955	*	39,193,986	1.000003	125	1.0000	#	1989		598,001,103	1.0089	20,240,180	
1956	*	42,144,071	1.000004	180	1.0000	#	1990		629,106,068	1.0115		
1957	*	45,316,206	1.000006	258	1.0000	#	1991		597,918,050	1.0108		
1958	*	48,727,103	1.000008	369	1.0000	#	1992		549,255,270	1.0146		
1959	*	52,394,734	1.000010	530	1.0000	#	1993		467,299,733	1.0106		
1960	*	56,338,424	1.000013	759	1.0001	#	1994		435,175,224	1.0199		
1961	*	60,578,951	1.000018	1,089	1.0001	#	1995		409,668,534	1.0206		
1962	*	65,138,657	1.000024	1,561	1.0001	#	1996		405,697,781	1.0169		
1963	*	70,041,566	1.000032	2,238	1.0001	#	1997		432,810,864	1.0163		
1964	*	75,313,512	1.000043	3,208	1.0002	#	1998		485,182,557	1.0304		
1965	*	80,982,271	1.000057	4,599	1.0002	#	1999		523,763,701	1.0080		
1966	*	87,077,711	1.000076	6,594	1.0003	#	2000		541,121,837	1.0126		
1967	*	93,631,947	1.000101	9,453	1.0004	#	2001		498,350,772	1.0126		
1968	*	100,679,513	1.000135	13,553	1.0005	#	2002		507,163,723	1.0501		
1969	*	108,257,541	1.000180	19,430	1.0007	#	2003		507,944,200	1.0681		
1970	*	116,405,958	1.000239	27,854	1.0010	#	2004		538,938,341	1.1243		
1971	*	125,167,697	1.000319	39,931	1.0013	#	2005		511,941,716	2.3210		
1972	*	134,588,921	1.000425	57,243	1.0017	#	2006		222,410,461			

Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

Indemnity: 04v05

Latest 12/31 Prior to 1985 Incurred	3,809,476,184	
Next Latest 12/31 Prior to 1985 Incurred	3,804,909,342	1 Policy Yr 1984 Incurred = Average of 1985, 1986, 1987, reduced by PY Deflation ^ 2
CY Development of Prior Yrs	4,566,842	2 PY 1983 & Prior = Subsequent Yr x PY Deflation
Next Latest PY 1985 Incurred	559,645,744	3 1984 Development Selected Based on Observed 1985, 1986, 1987
# of 1985 Yrs in Prior Data	6.81	4 PY 1983 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0
Selected Decrement, Development Factor	0.75	
Selected Average PY Deflation Factor	0.95	

TAIL = 1.0089 vs 1.0082 4,566,842  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/05 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/05 Incurred	Prior Year Development	Dollar Development	DF	
1938	*	56,220,076	1.000000	0	1.0000	#	1972	*	321,579,866	1.000070	22,503	1.0003
1939	*	59,179,028	1.000000	0	1.0000	#	1973	*	338,505,122	1.000093	31,582	1.0004
1940	*	62,293,713	1.000000	0	1.0000	#	1974	*	356,321,182	1.000124	44,324	1.0005
1941	*	65,572,330	1.000000	1	1.0000	#	1975	*	375,074,928	1.000166	62,207	1.0007
1942	*	69,023,505	1.000000	1	1.0000	#	1976	*	394,815,714	1.000221	87,303	1.0009
1943	*	72,656,321	1.000000	1	1.0000	#	1977	*	415,595,488	1.000295	122,521	1.0012
1944	*	76,480,338	1.000000	2	1.0000	#	1978	*	437,468,935	1.000393	171,943	1.0016
1945	*	80,505,619	1.000000	2	1.0000	#	1979	*	460,493,616	1.000524	241,292	1.0021
1946	*	84,742,757	1.000000	3	1.0000	#	1980	*	484,730,122	1.000699	338,596	1.0028
1947	*	89,202,902	1.000000	5	1.0000	#	1981	*	510,242,233	1.000932	475,112	1.0037
1948	*	93,897,791	1.000000	7	1.0000	#	1982	*	537,097,088	1.001243	666,616	1.0050
1949	*	98,839,780	1.000000	9	1.0000	#	1983	*	565,365,355	1.001657	935,215	1.0066
1950	*	104,041,874	1.000000	13	1.0000	#	1984	*	595,121,427	1.00220923	1,311,859	1.0089
1951	*	109,517,762	1.000000	18	1.0000	#	1985		560,619,701	1.0017		
1952	*	115,281,855	1.000000	26	1.0000	#	1986		642,795,665	1.0023	Total	
1953	*	121,349,321	1.000000	36	1.0000	#	1987		774,827,604	1.0015	Development:	
1954	*	127,736,127	1.000000	50	1.0000	#	1988		875,704,591	1.0032	4,566,842	
1955	*	134,459,082	1.000001	71	1.0000	#	1989		1,014,938,011	1.0019		
1956	*	141,535,875	1.000001	99	1.0000	#	1990		1,064,066,970	1.0021		
1957	*	148,985,132	1.000001	139	1.0000	#	1991		954,813,525	1.0037		
1958	*	156,826,455	1.000001	196	1.0000	#	1992		838,848,429	1.0039		
1959	*	165,080,479	1.000002	274	1.0000	#	1993		724,665,760	1.0024		
1960	*	173,768,925	1.000002	385	1.0000	#	1994		667,904,596	1.0036		
1961	*	182,914,658	1.000003	541	1.0000	#	1995		570,279,863	1.0037		
1962	*	192,541,745	1.000004	759	1.0000	#	1996		498,251,986	1.0077		
1963	*	202,675,521	1.000005	1,065	1.0000	#	1997		519,883,532	1.0057		
1964	*	213,342,654	1.000007	1,495	1.0000	#	1998		557,411,578	1.0118		
1965	*	224,571,214	1.000009	2,098	1.0000	#	1999		641,609,533	1.0113		
1966	*	236,390,752	1.000012	2,944	1.0000	#	2000		674,312,377	1.0234		
1967	*	248,832,370	1.000017	4,132	1.0001	#	2001		618,777,509	1.0481		
1968	*	261,928,811	1.000022	5,800	1.0001	#	2002		567,433,905	1.1486		
1969	*	275,714,538	1.000030	8,140	1.0001	#	2003		465,612,742	1.3972		
1970	*	290,225,829	1.000039	11,424	1.0002	#	2004		363,047,043	2.9740		
1971	*	305,500,873	1.000052	16,033	1.0002	#	2005		119,797,473			

Inputs for Tail Factor Estimation - 2010 Loss Cost Filing

Medical 04v05

Latest 12/31 Prior to 1985 Incurred	1,037,205,249	
Next Latest 12/31 Prior to 1985 Incurred	1,023,232,989	1 Policy Yr 1984 Incurred = Average of 1985, 1986, 1987, reduced by PY Deflation ^ 2
CY Development of Prior Yrs	13,972,260	2 PY 1983 & Prior = Subsequent Yr x PY Deflation
Next Latest PY 1985 Incurred	252,121,883	3 1984 Development Selected Based on Observed 1985, 1986, 1987
# of 1985 Yrs in Prior Data	4.11	4 PY 1983 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0
Selected Decrement, Development Factor	0.75	
Selected Average PY Deflation Factor	0.93	

TAIL = 1.0666 vs 1.0554 13,972,260  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2010 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/05 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/05 Incurred	Prior Year Development	Dollar Development	DF	
1939	*	10,062,210	1.000000	0	1.0000	#	1973	*	118,651,470	1.000684	81,117	1.0027
1940	*	10,819,581	1.000000	1	1.0000	#	1974	*	127,582,226	1.000912	116,270	1.0037
1941	*	11,633,958	1.000000	1	1.0000	#	1975	*	137,185,189	1.001216	166,645	1.0049
1942	*	12,509,632	1.000000	1	1.0000	#	1976	*	147,510,956	1.001622	238,820	1.0065
1943	*	13,451,217	1.000000	2	1.0000	#	1977	*	158,613,931	1.002162	342,210	1.0087
1944	*	14,463,674	1.000000	2	1.0000	#	1978	*	170,552,614	1.002883	490,271	1.0116
1945	*	15,552,338	1.000000	3	1.0000	#	1979	*	183,389,908	1.003844	702,224	1.0155
1946	*	16,722,944	1.000000	5	1.0000	#	1980	*	197,193,449	1.005125	1,005,490	1.0207
1947	*	17,981,660	1.000000	7	1.0000	#	1981	*	212,035,967	1.006834	1,439,117	1.0277
1948	*	19,335,118	1.000001	10	1.0000	#	1982	*	227,995,663	1.009111	2,058,592	1.0370
1949	*	20,790,450	1.000001	14	1.0000	#	1983	*	245,156,627	1.012148	2,942,530	1.0496
1950	*	22,355,323	1.000001	20	1.0000	#	1984	*	263,609,276	1.016197959	4,201,870	1.0666
1951	*	24,037,981	1.000001	29	1.0000	#	1985		256,528,384	1.0175		
1952	*	25,847,292	1.000002	42	1.0000	#	1986		283,007,501	1.0174		
1953	*	27,792,787	1.000002	60	1.0000	#	1987		374,821,647	1.0180	Total	
1954	*	29,884,717	1.000003	86	1.0000	#	1988		451,023,649	1.0078	Development:	
1955	*	32,134,104	1.000004	124	1.0000	#	1989		547,525,955	1.0139	13,972,260	
1956	*	34,552,800	1.000005	178	1.0000	#	1990		583,973,112	1.0102		
1957	*	37,153,549	1.000007	255	1.0000	#	1991		557,835,742	1.0183		
1958	*	39,950,052	1.000009	365	1.0000	#	1992		520,531,768	1.0155		
1959	*	42,957,045	1.000012	524	1.0000	#	1993		437,565,564	1.0153		
1960	*	46,190,371	1.000016	751	1.0001	#	1994		408,219,045	1.0114		
1961	*	49,667,066	1.000022	1,076	1.0001	#	1995		381,578,031	1.0169		
1962	*	53,405,447	1.000029	1,543	1.0001	#	1996		380,138,756	1.0198		
1963	*	57,425,212	1.000039	2,212	1.0002	#	1997		403,519,455	1.0206		
1964	*	61,747,540	1.000051	3,172	1.0002	#	1998		457,268,696	1.0184		
1965	*	66,395,204	1.000068	4,547	1.0003	#	1999		507,458,242	1.0227		
1966	*	71,392,693	1.000091	6,519	1.0004	#	2000		521,696,471	1.0252		
1967	*	76,766,336	1.000122	9,346	1.0005	#	2001		471,070,279	1.0205		
1968	*	82,544,448	1.000162	13,399	1.0006	#	2002		460,370,470	1.0456		
1969	*	88,757,471	1.000216	19,208	1.0009	#	2003		446,807,003	1.1072		
1970	*	95,438,140	1.000289	27,537	1.0012	#	2004		460,469,261	2.3906		
1971	*	102,621,656	1.000385	39,476	1.0015	#	2005		213,337,922			
1972	*	110,345,867	1.000513	56,589	1.0021	#						