

PENNSYLVANIA COMPENSATION RATING BUREAU

Tail Factors for Loss Development

The PCRB collects financial loss development data for separate policy years beginning with policy year 1978 and continuing forward to the most recent policy period. For policy years prior to 1978, a single aggregate line of experience is reported for all older policy years combined.

Beginning with collection of financial data valued as of 12/31/99, the PCRB will advance by one year the earliest policy year reported from 1978 to 1979 as of 12/31/99 and 1980 as of 12/31/00. Thus, the 1998 vs. 1999 valuations in the tail factor calculation will use policy years 1979 as the earliest separate policy year and an aggregate line of experience for policy years 1978 and prior. The 1999 vs. 2000 valuations in the tail factor calculation will use policy years 1980 as the earliest separate policy year and an aggregate line of experience for policy years 1979 and prior. The following discussion focuses on data with an earlier available policy year of 1978. The discussion for data starting with policy years 1979 and 1980 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 PCRIB 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. Since policy year 1978 is at a different maturity for each calendar year, the initial calculations made for each calendar year of development reflect varying maturities for the beginning of the tail. For purposes of further comparison and averaging, results have also been expressed on page 1 in terms of an appropriate tail factor from 20th report to ultimate where possible. Finally, averages computed using both two-year and four-year calculations are presented for comparison purposes. 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	INDEMNITY				MEDICAL			
		OLD	NEW	OLD AT CONSTANT MATURITY 20-ULT	NEW AT CONSTANT MATURITY 20-ULT	OLD	NEW	OLD AT CONSTANT MATURITY 20-ULT	NEW AT CONSTANT MATURITY 20-ULT
99V00	20TH TO ULT.	1.0171	1.0212	1.0171	1.0212	1.0821	1.1015	1.0821	1.1015
98V99	20TH TO ULT.	1.0047	1.0059	1.0047	1.0059	1.0473	1.0606	1.0473	1.0606
97V98	20TH TO ULT.	0.9930	0.9922	0.9930	0.9922	1.0718	1.0724	1.0718	1.0724
96V97	19TH TO ULT.	1.0112	1.0136	N/A	1.0102	1.0579	1.0650	N/A	1.0484
AVERAGE OF LATEST 2 VALUATIONS				1.0109	1.0136			1.0647	1.0811
AVERAGE OF LATEST 4 VALUATIONS				N/A	1.0074			N/A	1.0707

Indemnity: 99v00

Latest 12/31 Prior to 1980 Incurred	2,563,112,144
Next Latest 12/31 Prior to 1980 Incurred	2,556,871,830
CY Development of Prior Yrs	6,240,314
Next Latest PY 1980 Incurred	364,324,642
# of 1980 Yrs in Prior Data	7.04
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1979 Incurred = Average of 1980, 1981, 1982, reduced by PY Deflation ^ 2
- 2 PY 1978 & Prior = Subsequent Yr x PY Deflation
- 3 1979 Development Selected Based on Observed 1980, 1981, 1982
- 4 PY 1978 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0212 vs 1.0171 6,240,317  
-3

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2002 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/00 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/00 Incurred	Prior Year Development	Dollar Development	DF	
1935	*	35,861,069	1.000000	1	1.0000	#	1968	*	194,869,671	1.000222	43,230	1.0009
1936	*	37,748,493	1.000000	1	1.0000	#	1969	*	205,125,969	1.000296	60,669	1.0012
1937	*	39,735,256	1.000000	1	1.0000	#	1970	*	215,922,073	1.000394	85,142	1.0016
1938	*	41,826,585	1.000000	2	1.0000	#	1971	*	227,286,392	1.000526	119,481	1.0021
1939	*	44,027,984	1.000000	2	1.0000	#	1972	*	239,248,834	1.000701	167,664	1.0028
1940	*	46,345,247	1.000000	3	1.0000	#	1973	*	251,840,878	1.000935	235,263	1.0037
1941	*	48,784,470	1.000000	5	1.0000	#	1974	*	265,095,661	1.001247	330,091	1.0050
1942	*	51,352,074	1.000000	6	1.0000	#	1975	*	279,048,064	1.001662	463,093	1.0067
1943	*	54,054,815	1.000000	9	1.0000	#	1976	*	293,734,804	1.002216	649,595	1.0089
1944	*	56,899,805	1.000000	13	1.0000	#	1977	*	309,194,531	1.002955	911,041	1.0119
1945	*	59,894,532	1.000000	18	1.0000	#	1978	*	325,467,927	1.003940	1,277,400	1.0159
1946	*	63,046,875	1.000000	25	1.0000	#	1979	*	342,597,818	1.005253700	1,790,499	1.0212
1947	*	66,365,132	1.000001	35	1.0000	#	1980	*	365,132,589	1.0022		
1948	*	69,858,034	1.000001	49	1.0000	#	1981	*	388,969,952	0.9982		
1949	*	73,534,772	1.000001	69	1.0000	#	1982	*	384,726,772	0.9978	Total	
1950	*	77,405,023	1.000001	97	1.0000	#	1983	*	457,368,306	1.0011	Development:	
1951	*	81,478,972	1.000002	136	1.0000	#	1984	*	581,998,371	1.0008	6,240,317	
1952	*	85,767,339	1.000002	191	1.0000	#	1985	*	665,137,947	0.9955		
1953	*	90,281,409	1.000003	268	1.0000	#	1986	*	775,372,550	0.9968		
1954	*	95,033,063	1.000004	376	1.0000	#	1987	*	936,703,323	0.9979		
1955	*	100,034,803	1.000005	527	1.0000	#	1988	*	1,077,081,902	1.0018		
1956	*	105,299,792	1.000007	740	1.0000	#	1989	*	1,253,224,317	1.0003		
1957	*	110,841,887	1.000009	1,039	1.0000	#	1990	*	1,277,795,972	0.9975		
1958	*	116,675,670	1.000012	1,458	1.0000	#	1991	*	1,128,980,629	0.9998		
1959	*	122,816,495	1.000017	2,046	1.0001	#	1992	*	938,046,221	0.9967		
1960	*	129,280,521	1.000022	2,872	1.0001	#	1993	*	806,014,731	0.9939		
1961	*	136,084,759	1.000030	4,031	1.0001	#	1994	*	741,667,184	1.0051		
1962	*	143,247,115	1.000039	5,657	1.0002	#	1995	*	626,040,477	1.0269		
1963	*	150,786,436	1.000053	7,939	1.0002	#	1996	*	525,507,029	1.0661		
1964	*	158,722,565	1.000070	11,143	1.0003	#	1997	*	528,949,456	1.1276		
1965	*	167,076,384	1.000094	15,639	1.0004	#	1998	*	465,256,942	1.3444		
1966	*	175,869,878	1.000125	21,948	1.0005	#	1999	*	374,512,633	3.0230		
1967	*	185,126,187	1.000166	30,803	1.0007	#	2000	*	121,265,448			

Inputs for Tail Factor Estimation - 2002 Loss Cost Filing

**Medical 99v00**

Latest 12/31 Prior to 1980 Incurred	452,577,401
Next Latest 12/31 Prior to 1980 Incurred	444,280,916
CY Development of Prior Yrs	8,296,485
Next Latest PY 1980 Incurred	101,053,171
# of 1980 Yrs in Prior Data	4.48
Selected Decrement, Development Factor	0.75
Selected Average PY Inflation	0.93

- 1 Policy Yr 1979 Incurred = Average of 1980, 1981, 1982, reduced by PY Deflation ^ 2
- 2 PY 1978 & Prior = Subsequent Yr x PY Deflation
- 3 1979 Development Selected Based on Observed 1980, 1981, 1982
- 4 PY 1978 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.1015 vs 1.0821 8,296,485  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2002 Loss Cost Filing

**MEDICAL**

Policy Year	(*=Estimate)	12/31/00 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/00 Incurred	Prior Year Development	Dollar Development	DF
1932	*	3,459,311	1.000000	0	1.0000 #	1968	*	47,163,218	1.001027	48,393	1.0041
1933	*	3,719,689	1.000000	0	1.0000 #	1969	*	50,713,137	1.001370	69,357	1.0055
1934	*	3,999,666	1.000000	0	1.0000 #	1970	*	54,530,255	1.001826	99,392	1.0073
1935	*	4,300,716	1.000000	0	1.0000 #	1971	*	58,634,683	1.002435	142,410	1.0098
1936	*	4,624,425	1.000000	0	1.0000 #	1972	*	63,048,046	1.003246	204,008	1.0131
1937	*	4,972,500	1.000000	1	1.0000 #	1973	*	67,793,598	1.004328	292,169	1.0174
1938	*	5,346,775	1.000000	1	1.0000 #	1974	*	72,896,342	1.005771	418,279	1.0233
1939	*	5,749,220	1.000000	1	1.0000 #	1975	*	78,383,164	1.007695	598,539	1.0312
1940	*	6,181,957	1.000000	2	1.0000 #	1976	*	84,282,972	1.010260	855,941	1.0418
1941	*	6,647,266	1.000000	3	1.0000 #	1977	*	90,626,851	1.013680	1,223,016	1.0560
1942	*	7,147,598	1.000001	4	1.0000 #	1978	*	97,448,227	1.018240	1,745,575	1.0753
1943	*	7,685,589	1.000001	6	1.0000 #	1979	*	104,783,040	1.024319430	2,487,763	1.1015
1944	*	8,264,074	1.000001	9	1.0000 #	1980		104,393,260	1.0331		20TH TO ULT.
1945	*	8,886,101	1.000001	12	1.0000 #	1981		122,063,530	0.9999	Total	
1946	*	9,554,947	1.000002	18	1.0000 #	1982		136,994,615	1.0149	Development:	
1947	*	10,274,137	1.000002	25	1.0000 #	1983		165,136,859	1.0152	8,296,485	
1948	*	11,047,459	1.000003	36	1.0000 #	1984		216,676,839	1.0175		
1949	*	11,878,988	1.000004	52	1.0000 #	1985		278,011,772	1.0056		
1950	*	12,773,106	1.000006	74	1.0000 #	1986		315,797,273	0.9996		
1951	*	13,734,522	1.000008	106	1.0000 #	1987		418,977,530	1.0087		
1952	*	14,768,303	1.000010	152	1.0000 #	1988		507,778,656	1.0074		
1953	*	15,879,896	1.000014	218	1.0001 #	1989		626,871,908	1.0138		
1954	*	17,075,157	1.000018	312	1.0001 #	1990		663,540,676	1.0056		
1955	*	18,360,384	1.000024	448	1.0001 #	1991		620,130,187	1.0125		
1956	*	19,742,348	1.000033	642	1.0001 #	1992		537,326,072	1.0141		
1957	*	21,228,332	1.000043	921	1.0002 #	1993		456,367,997	0.9993		
1958	*	22,826,163	1.000058	1,320	1.0002 #	1994		416,847,952	1.0112		
1959	*	24,544,261	1.000077	1,893	1.0003 #	1995		390,152,723	1.0132		
1960	*	26,391,679	1.000103	2,714	1.0004 #	1996		392,122,168	1.0199		
1961	*	28,378,149	1.000137	3,890	1.0005 #	1997		424,438,110	1.0473		
1962	*	30,514,139	1.000183	5,577	1.0007 #	1998		439,427,215	1.1000		
1963	*	32,810,902	1.000244	7,996	1.0010 #	1999		415,794,438	2.4133		
1964	*	35,280,540	1.000325	11,462	1.0013 #	2000		191,147,565			
1965	*	37,936,064	1.000433	16,431	1.0017 #						
1966	*	40,791,467	1.000578	23,554	1.0023 #						
1967	*	43,861,793	1.000770	33,763	1.0031 #						

Inputs for Tail Factor Estimation - 2002 Loss Cost Filing

Indemnity: 98v99

Latest 12/31 Prior to 1979 Incurred	2,206,233,130
Next Latest 12/31 Prior to 1979 Incurred	2,204,497,181
CY Development of Prior Yrs	1,735,949
Next Latest PY 1979 Incurred	366,028,692
# of 1979 Yrs in Prior Data	6.03
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1978 Incurred = Average of 1979, 1980, 1981, reduced by PY Deflation ^ 2
- 2 PY 1977 & Prior = Subsequent Yr x PY Deflation
- 3 1978 Development Selected Based on Observed 1979, 1980, 1981
- 4 PY 1977 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0059 vs 1.0047 1,735,949  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2002 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/99 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/99 Incurred	Prior Year Development	Dollar Development	DF
1933	*	33,730,256	1.000000	0	1.0000 #	1967	*	192,937,685	1.000062	11,990	1.0002
1934	*	35,505,533	1.000000	0	1.0000 #	1968	*	203,092,300	1.000083	16,828	1.0003
1935	*	37,374,245	1.000000	0	1.0000 #	1969	*	213,781,368	1.000110	23,618	1.0004
1936	*	39,341,311	1.000000	0	1.0000 #	1970	*	225,033,019	1.000147	33,148	1.0006
1937	*	41,411,906	1.000000	0	1.0000 #	1971	*	236,876,862	1.000196	46,523	1.0008
1938	*	43,591,480	1.000000	1	1.0000 #	1972	*	249,344,065	1.000262	65,296	1.0010
1939	*	45,885,769	1.000000	1	1.0000 #	1973	*	262,467,437	1.000349	91,643	1.0014
1940	*	48,300,809	1.000000	1	1.0000 #	1974	*	276,281,513	1.000466	128,622	1.0019
1941	*	50,842,957	1.000000	2	1.0000 #	1975	*	290,822,645	1.000621	180,522	1.0025
1942	*	53,518,902	1.000000	3	1.0000 #	1976	*	306,129,100	1.000828	253,364	1.0033
1943	*	56,335,686	1.000000	4	1.0000 #	1977	*	322,241,158	1.001104	355,598	1.0044
1944	*	59,300,722	1.000000	5	1.0000 #	1978	*	339,201,219	1.00147136	499,085	1.0059 20TH TO ULT.
1945	*	62,421,813	1.000000	7	1.0000 #	1979		367,025,325	1.0027		
1946	*	65,707,172	1.000000	10	1.0000 #	1980		367,362,446	1.0022		
1947	*	69,165,444	1.000000	14	1.0000 #	1981		393,150,907	1.0043	Total	
1948	*	72,805,730	1.000000	19	1.0000 #	1982		390,025,792	0.9997	Development:	
1949	*	76,637,611	1.000000	27	1.0000 #	1983		461,198,968	1.0014	1,735,949	
1950	*	80,671,169	1.000000	38	1.0000 #	1984		585,356,746	0.9990		
1951	*	84,917,020	1.000001	53	1.0000 #	1985		670,156,439	0.9967		
1952	*	89,386,337	1.000001	74	1.0000 #	1986		779,574,014	0.9997		
1953	*	94,090,881	1.000001	104	1.0000 #	1987		941,061,692	1.0001		
1954	*	99,043,033	1.000001	146	1.0000 #	1988		1,093,128,727	0.9984		
1955	*	104,255,824	1.000002	205	1.0000 #	1989		1,267,671,479	0.9997		
1956	*	109,742,973	1.000003	288	1.0000 #	1990		1,299,131,017	0.9986		
1957	*	115,518,919	1.000003	404	1.0000 #	1991		1,154,239,130	0.9974		
1958	*	121,598,862	1.000005	567	1.0000 #	1992		952,883,987	0.9911		
1959	*	127,998,802	1.000006	796	1.0000 #	1993		821,850,746	1.0012		
1960	*	134,735,581	1.000008	1,118	1.0000 #	1994		746,807,693	1.0394		
1961	*	141,826,927	1.000011	1,569	1.0000 #	1995		615,202,647	1.0719		
1962	*	149,291,503	1.000015	2,202	1.0001 #	1996		493,117,505	1.1575		
1963	*	157,148,950	1.000020	3,090	1.0001 #	1997		479,041,914	1.3865		
1964	*	165,419,947	1.000026	4,337	1.0001 #	1998		357,036,512	3.0941		
1965	*	174,126,260	1.000035	6,087	1.0001 #	1999		126,958,404			
1966	*	183,290,800	1.000047	8,543	1.0002 #						

Inputs for Tail Factor Estimation - 2002 Loss Cost Filing

Medical **98v99**

Latest 12/31 Prior to 1979 Incurred	349,377,529
Next Latest 12/31 Prior to 1979 Incurred	344,836,855
CY Development of Prior Yrs	4,540,674
Next Latest PY 1979 Incurred	95,992,351
# of 1979 Yrs in Prior Data	3.64
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1978 Incurred = Average of 1979, 1980, 1981, reduced by PY Deflation ^ 2
- 2 PY 1977 & Prior = Subsequent Yr x PY Deflation
- 3 1978 Development Selected Based on Observed 1979, 1980, 1981
- 4 PY 1977 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0606 vs 1.0473 4,540,674  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2001 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/99 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/99 Incurred	Prior Year Development	Dollar Development	DF	
1931	*	3,069,627	1.000000	0	1.0000	#	1968	*	45,000,409	1.000832	37,436	1.0033
1932	*	3,300,674	1.000000	0	1.0000	#	1969	*	48,387,537	1.001109	53,671	1.0044
1933	*	3,549,112	1.000000	0	1.0000	#	1970	*	52,029,609	1.001479	76,948	1.0059
1934	*	3,816,249	1.000000	0	1.0000	#	1971	*	55,945,816	1.001972	110,320	1.0079
1935	*	4,103,494	1.000000	0	1.0000	#	1972	*	60,156,792	1.002629	158,165	1.0106
1936	*	4,412,359	1.000000	0	1.0000	#	1973	*	64,684,723	1.003506	226,760	1.0141
1937	*	4,744,472	1.000000	1	1.0000	#	1974	*	69,553,465	1.004674	325,104	1.0188
1938	*	5,101,583	1.000000	1	1.0000	#	1975	*	74,788,672	1.006232	466,099	1.0252
1939	*	5,485,573	1.000000	1	1.0000	#	1976	*	80,417,927	1.008310	668,243	1.0337
1940	*	5,898,465	1.000000	2	1.0000	#	1977	*	86,470,889	1.011079	958,054	1.0452
1941	*	6,342,436	1.000000	2	1.0000	#	1978	*	92,979,451	1.014772661	1,373,554	1.0606
1942	*	6,819,823	1.000000	3	1.0000	#	1979	*	97,503,152	1.0157		20TH TO ULT.
1943	*	7,333,143	1.000001	5	1.0000	#	1980	*	101,831,694	1.0123		
1944	*	7,885,100	1.000001	7	1.0000	#	1981	*	123,174,522	1.0045	Total	
1945	*	8,478,603	1.000001	9	1.0000	#	1982	*	136,751,551	1.0356	Development:	
1946	*	9,116,777	1.000001	14	1.0000	#	1983	*	164,096,421	1.0078	4,540,674	
1947	*	9,802,986	1.000002	19	1.0000	#	1984	*	214,095,446	1.0002		
1948	*	10,540,845	1.000003	28	1.0000	#	1985	*	277,197,009	1.0114		
1949	*	11,334,242	1.000004	40	1.0000	#	1986	*	316,422,352	1.0221		
1950	*	12,187,357	1.000005	57	1.0000	#	1987	*	416,590,191	1.0017		
1951	*	13,104,685	1.000006	82	1.0000	#	1988	*	511,811,219	1.0054		
1952	*	14,091,059	1.000008	117	1.0000	#	1989	*	625,902,274	1.0109		
1953	*	15,151,677	1.000011	168	1.0000	#	1990	*	670,653,854	1.0041		
1954	*	16,292,125	1.000015	241	1.0001	#	1991	*	626,912,720	1.0103		
1955	*	17,518,414	1.000020	346	1.0001	#	1992	*	538,650,449	0.9998		
1956	*	18,837,005	1.000026	496	1.0001	#	1993	*	465,139,281	1.0041		
1957	*	20,254,844	1.000035	712	1.0001	#	1994	*	418,332,161	1.0079		
1958	*	21,779,402	1.000047	1,020	1.0002	#	1995	*	389,646,227	1.0106		
1959	*	23,418,712	1.000062	1,463	1.0002	#	1996	*	384,562,225	1.0289		
1960	*	25,181,410	1.000083	2,097	1.0003	#	1997	*	413,374,615	1.1133		
1961	*	27,076,785	1.000111	3,007	1.0004	#	1998	*	411,427,156	2.2567		
1962	*	29,114,823	1.000148	4,311	1.0006	#	1999	*	177,111,729			
1963	*	31,306,261	1.000197	6,180	1.0008	#						
1964	*	33,662,646	1.000263	8,861	1.0011	#						
1965	*	36,196,394	1.000351	12,703	1.0014	#						
1966	*	38,920,854	1.000468	18,213	1.0019	#						
1967	*	41,850,380	1.000624	26,112	1.0025	#						

Inputs for Tail Factor Estimation - 2001 Loss Cost Filing

Indemnity: 97v98

Latest 12/31 Prior to 1978 Incurred	1,867,296,514
Next Latest 12/31 Prior to 1978 Incurred	1,869,389,536
CY Development of Prior Yrs	-2,093,022
Next Latest PY 1978 Incurred	297,072,695
# of 1978 Yrs in Prior Data	6.29
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1977 Incurred = Average of 1978, 1979, 1980, reduced by PY Deflation ^ 2
- 2 PY 1976 & Prior = Subsequent Yr x PY Deflation
- 3 1977 Development Selected Based on Observed 1978, 1979, 1980
- 4 PY 1976 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = .9922 vs .9930 -2,093,022  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2001 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/98 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/98 Incurred	Prior Year Development	Dollar Development	DF	
1933	*	32,377,553	1.000000	0	1.0000	#	1967	*	185,200,197	.999890	-20,289	.9996
1934	*	34,081,635	1.000000	0	1.0000	#	1968	*	194,947,575	.999854	-28,476	.9994
1935	*	35,875,405	1.000000	0	1.0000	#	1969	*	205,207,974	.999805	-39,966	.9992
1936	*	37,763,584	1.000000	-1	1.0000	#	1970	*	216,008,394	.999740	-56,093	.9990
1937	*	39,751,141	1.000000	-1	1.0000	#	1971	*	227,377,257	.999654	-78,727	.9986
1938	*	41,843,307	1.000000	-1	1.0000	#	1972	*	239,344,481	.999538	-110,493	.9982
1939	*	44,045,586	1.000000	-2	1.0000	#	1973	*	251,941,559	.999384	-155,078	.9975
1940	*	46,363,775	1.000000	-2	1.0000	#	1974	*	265,201,641	.999179	-217,654	.9967
1941	*	48,803,973	1.000000	-3	1.0000	#	1975	*	279,159,622	.998906	-305,479	.9956
1942	*	51,372,603	1.000000	-4	1.0000	#	1976	*	293,852,233	.998541	-428,743	.9942
1943	*	54,076,425	1.000000	-6	1.0000	#	1977	*	309,318,140	.9980546	-601,744	.9922
1944	*	56,922,552	1.000000	-8	1.0000	#	1978		296,029,968	0.9965		
1945	*	59,918,476	1.000000	-12	1.0000	#	1979		366,036,449	1.0026		
1946	*	63,072,080	1.000000	-16	1.0000	#	1980		366,137,928	1.0009		
1947	*	66,391,663	1.000000	-23	1.0000	#	1981		391,379,504	0.9975	Total	
1948	*	69,885,961	1.000000	-32	1.0000	#	1982		390,197,713	1.0018	Development:	
1949	*	73,564,170	.999999	-45	1.0000	#	1983		460,554,323	1.0050	-2,093,022	
1950	*	77,435,968	.999999	-64	1.0000	#	1984		585,906,505	1.0021		
1951	*	81,511,546	.999999	-89	1.0000	#	1985		672,710,560	1.0037		
1952	*	85,801,627	.999999	-126	1.0000	#	1986		779,542,137	1.0053		
1953	*	90,317,502	.999998	-176	1.0000	#	1987		940,063,451	0.9994		
1954	*	95,071,055	.999997	-247	1.0000	#	1988		1,093,971,055	1.0010		
1955	*	100,074,795	.999997	-347	1.0000	#	1989		1,267,951,103	0.9991		
1956	*	105,341,889	.999995	-487	1.0000	#	1990		1,301,647,996	1.0033		
1957	*	110,886,199	.999994	-684	1.0000	#	1991		1,157,508,979	1.0055		
1958	*	116,722,315	.999992	-960	1.0000	#	1992		961,808,630	1.0087		
1959	*	122,865,594	.999989	-1,348	1.0000	#	1993		821,322,629	1.0556		
1960	*	129,332,205	.999985	-1,891	.9999	#	1994		719,641,766	1.1389		
1961	*	136,139,163	.999981	-2,654	.9999	#	1995		573,442,718	1.2210		
1962	*	143,304,382	.999974	-3,726	.9999	#	1996		425,140,430	1.4435		
1963	*	150,846,718	.999965	-5,229	.9999	#	1997		337,790,879	3.0352		
1964	*	158,786,019	.999954	-7,339	.9998	#	1998		114,654,893			
1965	*	167,143,177	.999938	-10,300	.9998	#						
1966	*	175,940,187	.999918	-14,456	.9997	#						



Inputs for Tail Factor Estimation - 2001 Loss Cost Filing

Medical **97v98**

Latest 12/31 Prior to 1978 Incurred	277,380,613
Next Latest 12/31 Prior to 1978 Incurred	273,064,439
CY Development of Prior Yrs	4,316,174
Next Latest PY 1978 Incurred	60,109,492
# of 1978 Yrs in Prior Data	4.61
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1977 Incurred = Average of 1978, 1979, 1980, reduced by PY Deflation ^ 2
- 2 PY 1976 & Prior = Subsequent Yr x PY Deflation
- 3 1977 Development Selected Based on Observed 1978, 1979, 1980
- 4 PY 1976 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0724 vs 1.0718 4,316,174  
0

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2001 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/98 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/98 Incurred	Prior Year Development	Dollar Development	DF	
1931	*	2,638,356	1.000000	0	1.0000	#	1965	*	31,110,939	1.000556	17,312	1.0022
1932	*	2,836,942	1.000000	0	1.0000	#	1966	*	33,452,622	1.000742	24,821	1.0030
1933	*	3,050,475	1.000000	0	1.0000	#	1967	*	35,970,562	1.000989	35,585	1.0040
1934	*	3,280,081	1.000000	0	1.0000	#	1968	*	38,678,023	1.001319	51,018	1.0053
1935	*	3,526,968	1.000000	0	1.0000	#	1969	*	41,589,272	1.001759	73,144	1.0071
1936	*	3,792,439	1.000000	1	1.0000	#	1970	*	44,719,648	1.002345	104,866	1.0094
1937	*	4,077,892	1.000000	1	1.0000	#	1971	*	48,085,643	1.003127	150,345	1.0126
1938	*	4,384,830	1.000000	1	1.0000	#	1972	*	51,704,992	1.004169	215,549	1.0168
1939	*	4,714,871	1.000000	1	1.0000	#	1973	*	55,596,766	1.005558	309,030	1.0224
1940	*	5,069,753	1.000000	2	1.0000	#	1974	*	59,781,469	1.007411	443,054	1.0300
1941	*	5,451,348	1.000001	3	1.0000	#	1975	*	64,281,149	1.009882	635,203	1.0402
1942	*	5,861,664	1.000001	4	1.0000	#	1976	*	69,119,515	1.013176	910,686	1.0539
1943	*	6,302,865	1.000001	6	1.0000	#	1977	*	74,322,059	1.0175674	1,305,643	1.0724
1944	*	6,777,274	1.000001	9	1.0000	#	1978		61,272,538	1.0193		
1945	*	7,287,391	1.000002	13	1.0000	#	1979		95,995,535	1.0152		
1946	*	7,835,905	1.000002	18	1.0000	#	1980		100,526,097	1.0155		
1947	*	8,425,704	1.000003	26	1.0000	#	1981		122,545,787	1.0001	Total	
1948	*	9,059,897	1.000004	38	1.0000	#	1982		131,935,099	1.0113	Development:	
1949	*	9,741,824	1.000006	54	1.0000	#	1983		162,711,494	1.0077	4,316,174	
1950	*	10,475,080	1.000007	78	1.0000	#	1984		213,975,769	1.0002		
1951	*	11,263,527	1.000010	112	1.0000	#	1985		273,852,315	1.0044		
1952	*	12,111,319	1.000013	160	1.0001	#	1986		309,368,715	1.0050		
1953	*	13,022,924	1.000018	230	1.0001	#	1987		415,422,247	1.0179		
1954	*	14,003,144	1.000024	329	1.0001	#	1988		508,546,156	1.0067		
1955	*	15,057,144	1.000031	472	1.0001	#	1989		618,695,715	1.0131		
1956	*	16,190,477	1.000042	676	1.0002	#	1990		667,561,133	1.0121		
1957	*	17,409,115	1.000056	970	1.0002	#	1991		620,037,043	1.0171		
1958	*	18,719,479	1.000074	1,390	1.0003	#	1992		538,475,467	1.0173		
1959	*	20,128,472	1.000099	1,994	1.0004	#	1993		462,536,318	0.9990		
1960	*	21,643,518	1.000132	2,858	1.0005	#	1994		415,161,531	1.0154		
1961	*	23,272,600	1.000176	4,098	1.0007	#	1995		385,018,228	1.0476		
1962	*	25,024,301	1.000235	5,875	1.0009	#	1996		372,341,744	1.1145		
1963	*	26,907,851	1.000313	8,423	1.0013	#	1997		364,388,184	2.3209		
1964	*	28,933,173	1.000417	12,075	1.0017	#	1998		181,186,380			

Inputs for Tail Factor Estimation - 2001 Loss Cost Filing

Indemnity: 96v97

Latest 12/31 Prior to 1978 Incurred	1,869,716,023
Next Latest 12/31 Prior to 1978 Incurred	1,865,953,411
CY Development of Prior Yrs	3,762,612
Next Latest PY 1978 Incurred	336,477,772
# of 1978 Yrs in Prior Data	5.56
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.95

- 1 Policy Yr 1977 Incurred = Average of 1978, 1979, 1980, reduced by PY Deflation ^ 2
- 2 PY 1976 & Prior = Subsequent Yr x PY Deflation
- 3 1977 Development Selected Based on Observed 1978, 1979, 1980
- 4 PY 1976 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0136 vs 1.0112 3,762,611  
1

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2001 Loss Cost Filing

INDEMNITY

Policy Year	(*=Estimate)	12/31/97 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/97 Incurred	Prior Year Development	Dollar Development	DF	
1933	*	33,613,871	1.000000	0	1.0000	#	1967	*	192,271,957	1.000190	36,542	1.0008
1934	*	35,383,022	1.000000	1	1.0000	#	1968	*	202,391,534	1.000253	51,284	1.0010
1935	*	37,245,286	1.000000	1	1.0000	#	1969	*	213,043,720	1.000338	71,972	1.0014
1936	*	39,205,564	1.000000	1	1.0000	#	1970	*	224,256,547	1.000451	101,002	1.0018
1937	*	41,269,015	1.000000	1	1.0000	#	1971	*	236,059,523	1.000601	141,736	1.0024
1938	*	43,441,069	1.000000	2	1.0000	#	1972	*	248,483,709	1.000801	198,887	1.0032
1939	*	45,727,441	1.000000	3	1.0000	#	1973	*	261,561,799	1.001068	279,066	1.0043
1940	*	48,134,148	1.000000	4	1.0000	#	1974	*	275,328,209	1.001424	391,532	1.0057
1941	*	50,667,524	1.000000	5	1.0000	#	1975	*	289,819,167	1.001899	549,258	1.0076
1942	*	53,334,236	1.000000	8	1.0000	#	1976	*	305,072,808	1.002532	770,402	1.0102
1943	*	56,141,301	1.000000	11	1.0000	#	1977	*	321,129,271	1.0033756	1,080,357	1.0136
1944	*	59,096,106	1.000000	15	1.0000	#	1978		336,671,312	1.0006		
1945	*	62,206,428	1.000000	21	1.0000	#	1979		364,998,134	0.9944		
1946	*	65,480,450	1.000000	30	1.0000	#	1980		365,796,276	0.9963		
1947	*	68,926,790	1.000001	42	1.0000	#	1981		392,327,143	0.9974		
1948	*	72,554,516	1.000001	58	1.0000	#	1982		389,452,628	0.9967	Total	
1949	*	76,373,174	1.000001	82	1.0000	#	1983		458,270,312	0.9939	Development:	
1950	*	80,392,815	1.000001	115	1.0000	#	1984		584,653,354	0.9982	3,762,611	
1951	*	84,624,016	1.000002	161	1.0000	#	1985		670,213,221	1.0053		
1952	*	89,077,912	1.000003	226	1.0000	#	1986		775,440,639	0.9996		
1953	*	93,766,223	1.000003	318	1.0000	#	1987		940,668,610	0.9985		
1954	*	98,701,287	1.000005	446	1.0000	#	1988		1,091,784,280	1.0062		
1955	*	103,896,092	1.000006	626	1.0000	#	1989		1,268,087,039	1.0125		
1956	*	109,364,307	1.000008	878	1.0000	#	1990		1,292,896,214	1.0190		
1957	*	115,120,323	1.000011	1,232	1.0000	#	1991		1,145,382,899	1.0489		
1958	*	121,179,287	1.000014	1,730	1.0001	#	1992		948,608,635	1.1117		
1959	*	127,557,145	1.000019	2,427	1.0001	#	1993		774,071,736	1.1470		
1960	*	134,270,679	1.000025	3,407	1.0001	#	1994		627,747,602	1.2180		
1961	*	141,337,556	1.000034	4,782	1.0001	#	1995		467,856,710	1.4048		
1962	*	148,776,375	1.000045	6,711	1.0002	#	1996		298,723,285	2.5461		
1963	*	156,606,711	1.000060	9,419	1.0002	#	1997		112,532,265			
1964	*	164,849,169	1.000080	13,219	1.0003	#						
1965	*	173,525,441	1.000107	18,553	1.0004	#						
1966	*	182,658,359	1.000143	26,038	1.0006	#						

Inputs for Tail Factor Estimation - 2001 Loss Cost Filing

Medical **96v97**

Latest 12/31 Prior to 1978 Incurred	273,091,705
Next Latest 12/31 Prior to 1978 Incurred	269,188,832
CY Development of Prior Yrs	3,902,873
Next Latest PY 1978 Incurred	67,367,062
# of 1978 Yrs in Prior Data	4.05
Selected Decrement, Development Factor	0.75
Selected Average PY Deflation Factor	0.93

- 1 Policy Yr 1977 Incurred = Average of 1978, 1979, 1980, reduced by PY Deflation ^ 2
- 2 PY 1976 & Prior = Subsequent Yr x PY Deflation
- 3 1977 Development Selected Based on Observed 1978, 1979, 1980
- 4 PY 1976 & Prior Development = (Subsequent Yr - 1.0) x Selected Decrement + 1.0

TAIL = 1.0650 vs 1.0579 3,902,872  
1

Pennsylvania Compensation Rating Bureau  
Tail Factor Model - 2001 Loss Cost Filing

MEDICAL

Policy Year	(*=Estimate)	12/31/97 Incurred	Prior Year Development	Dollar Development	DF	Policy Year	(*=Estimate)	12/31/97 Incurred	Prior Year Development	Dollar Development	DF	
1931	*	2,677,091	1.000000	0	1.0000	#	1965	*	31,567,695	1.000501	15,803	1.0020
1932	*	2,878,592	1.000000	0	1.0000	#	1966	*	33,943,758	1.000668	22,653	1.0027
1933	*	3,095,261	1.000000	0	1.0000	#	1967	*	36,498,664	1.000890	32,471	1.0036
1934	*	3,328,237	1.000000	0	1.0000	#	1968	*	39,245,875	1.001187	46,539	1.0048
1935	*	3,578,750	1.000000	0	1.0000	#	1969	*	42,199,866	1.001583	66,696	1.0063
1936	*	3,848,118	1.000000	0	1.0000	#	1970	*	45,376,200	1.002111	95,571	1.0085
1937	*	4,137,761	1.000000	1	1.0000	#	1971	*	48,791,613	1.002814	136,924	1.0113
1938	*	4,449,206	1.000000	1	1.0000	#	1972	*	52,464,100	1.003752	196,123	1.0151
1939	*	4,784,092	1.000000	1	1.0000	#	1973	*	56,413,011	1.005003	280,830	1.0202
1940	*	5,144,185	1.000000	2	1.0000	#	1974	*	60,659,151	1.006671	401,956	1.0270
1941	*	5,531,382	1.000001	3	1.0000	#	1975	*	65,224,894	1.008894	575,011	1.0361
1942	*	5,947,722	1.000001	4	1.0000	#	1976	*	70,134,294	1.011859	821,974	1.0484
1943	*	6,395,400	1.000001	6	1.0000	#	1977	*	75,413,220	1.0158120	1,173,871	1.0650
1944	*	6,876,775	1.000001	8	1.0000	#	1978		68,052,523	1.0102		
1945	*	7,394,381	1.000002	12	1.0000	#	1979		94,542,075	1.0461		
1946	*	7,950,948	1.000002	17	1.0000	#	1980		98,984,381	1.0105		
1947	*	8,549,406	1.000003	24	1.0000	#	1981		122,529,500	1.0150	Total	
1948	*	9,192,910	1.000004	35	1.0000	#	1982		130,478,265	1.0226	Development:	
1949	*	9,884,849	1.000005	50	1.0000	#	1983		161,462,041	1.0121	3,902,872	
1950	*	10,628,870	1.000007	71	1.0000	#	1984		213,923,729	1.0076		
1951	*	11,428,892	1.000009	102	1.0000	#	1985		272,667,521	1.0087		
1952	*	12,289,132	1.000012	146	1.0000	#	1986		307,823,757	0.9949		
1953	*	13,214,120	1.000016	210	1.0001	#	1987		408,134,825	0.9999		
1954	*	14,208,731	1.000021	301	1.0001	#	1988		504,188,945	1.0065		
1955	*	15,278,206	1.000028	431	1.0001	#	1989		609,906,766	1.0115		
1956	*	16,428,178	1.000038	618	1.0002	#	1990		656,663,908	1.0000		
1957	*	17,664,708	1.000050	886	1.0002	#	1991		604,947,534	1.0065		
1958	*	18,994,309	1.000067	1,270	1.0003	#	1992		525,934,281	1.0202		
1959	*	20,423,988	1.000089	1,821	1.0004	#	1993		459,245,197	1.0173		
1960	*	21,961,278	1.000119	2,610	1.0005	#	1994		404,155,804	1.0380		
1961	*	23,614,277	1.000158	3,742	1.0006	#	1995		364,416,053	1.1010		
1962	*	25,391,696	1.000211	5,364	1.0008	#	1996		337,301,980	2.1864		
1963	*	27,302,899	1.000282	7,690	1.0011	#	1997		158,714,046			
1964	*	29,357,956	1.000376	11,024	1.0015	#						