EVALUATING THE IMPACT OF INFLATION ON LOSS RESERVES
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A Review by Richard G. Woll

In evaluating loss reserves, actuaries regularly make use of quantitative techniques which use the past to project the future. Any such approach to reserve analysis requires the asumption that the dynamics underlying the loss settlement process are both stable and persistent. For example, the use of paid loss development factors to estimate loss reserves for any given year assumes that the pattern of loss development for that year is stochastically similar to the pattern for other years and that this similarity will persist for the foreseeable future.

When this assumption holds, estimates of loss reserves made using averages from past data will be unbiased with respect to the future.

Until recently, these assumptions tended to be true in most loss reserving situations, and most exceptions tended to be discontinuities (such as changes in coverages) which were pronounced and rare enough to be dealt with one by one on a judgmental basis. Changes have been coming about, however, which have made it difficult to use raw loss development data to estimate loss reserves. These developments have been:

1) The underlying rate of inflation has been increasing for almost twenty years. Changes in the rate of inflation from one period to the next have also increased significantly.

2) Loss reserves have gone from less than half of surplus in 1956 to over 150% of surplus as of 1979. Thus the impact of missestimates of reserves on surplus has tripled during this period.

In response, insurance management has sought to improve the accuracy of loss reserves by explicitly taking into account the effects of inflation. Mr. Richard's paper is evidence of this concern and is a good introduction to the problems involved in taking inflation into account when developing loss reserves.

Two points made in the paper will be discussed in this review:

The first point is that it is changes in the rate of inflation which create problems in loss reserve estimation. A steady inflation rate creates consistent loss settlement patterns over time and thus most standard analytic techniques will give accurate results. Changes in the rate of inflation, however, will distort loss development patterns and will thus reduce the accuracy of loss reserve estimation. This distortion consists primarily of larger differences between predicted and actual loss payments if the changes in the rate of inflation are essentially random (ie., unbiased) over time.

The effect of long term and consistent changes in the rate of inflation is much more unpleasant. If inflation is consistently increasing (or decreasing), then estimation techniques utilizing averages from past data will consistently understate (or overstate) current loss reserve requirements.

Some idea of the magnitude of these effects can be seen by referring to the paper which shows reserve requirements increasing from $440 million if the future inflation rate is 5%, to $526 million if the future inflation rate is 15%.

The second point to be discussed in this review is the procedure used by the author to take inflation into account. This procedure, in a nutshell, is:

1) Adjust historical loss settlement data to remove the effects of inflation.

2) Analyse the data using the methods customarily used.

3) Adjust the projected loss reserves determined in terms of real dollars in step (2), for the expected rates of inflation.

This procedure allows the analysis to be performed without the biases introduced by changing rates of inflation and then reintroduces actual and expected rates of inflation after the analysis has been completed.

There are some problems in this process which were not addressed by the author. The primary one is the fact that different types of losses, inflating at different rates, do not necessarily settle at the same rate. The author has constructed an index of inflation using a 60% weight for medical claims and 40% for indemnity claims. This, in turn, implies that 60% of the dollars of claims occurring during a particular year will be medical claims and the 40% will be indemnity claims. While this may very well be true, on average, it is almost certain that medical claims will settle faster than indemnity claims and thus will be a larger portion of the claims settled in the initial year of development. Conversely, they will form a smaller portion of those claims settled later. This means that the relative weight given to medical claims should be greater than 60% during the initial year of development and should be less than 60% subsequently.

Since data was lacking in the paper to enable further exploration of this point, workers' compensation claims from another company were employed to study differences in claim settlement rates between medical and indemnity claims. The process of settling claims in workers' compensation lines is different, of course, but the use of this data should help to illustrate the problem. The actual data is shown as Exhibit I, broken out by medical, indemnity, and total claims. Shown on Exhibit II is the relative proportion of medical claims settled at each stage of development and it can be seen that while medical claims were

approximately 33% of the total, on average, they formed over 50% of the claims settled during the initial year of development and less than 20% after two years.

The proper way to handle different types of losses, where practical, is to analyse them separately. If this is not possible, some attempt should be made to estimate what proportion of each type of loss settles at each year of development, and these estimates should be used to split the data out into the different types of loss.

Another problem with the method described in the paper is the underlying assumption that all losses are affected by inflation until paid. This assumption is probably not valid in many circumstances and a more general method is needed.

One way to handle this is to determine just how much inflation does effect losses after they have occurred. Clearly, one possibility is the one made by the author that inflation continues to effect loss amounts until payment. Another possibility would be that once a loss has occurred, subsequent inflation will have no effect. All other possibilities are between these two extremes.

One way to handle these possibilities is to create a matrix representing the degree to which losses paid in a particular year of development are affected by inflation subsequent to the year of occurrence. Such a matrix would represent a series of weights to be applied to the relevant years. Suppose, for example, that the assumption is made that all intervening years have equal weight. In other words, this assumption implies that the value of a loss settled four years after occurrence has been determined, in part, by circumstances existing at the date of loss, and by circumstances existing at various dates thereafter. This matrix, called WT, can be depicted as follows:

TABLE I

Effect of Inflation Subsequent to Claims Occurence

Chronological Year	Development Year				
	AY+0	AY+1	AY+2	AY+3	AY+4
0	1.00	0.50	0.33	0.25	0.20
1	0	0.50	0.33	0.25	0.20
2	0	0	0.33	0.25	0.20
3	0	0	0	0.25	0.20
4	0	0	0	0	0.20

This table is a statement of the hypothesis that events taking place during all years subsequent to occurrence play an equal role in determining the amount of losses paid. The author's hypothesis about losses being affected by all subsequent inflation would be expressed by a similar table with all zeroes except for the diagonals which would all be equal to one. The other extreme hypothesis, that no inflation subsequent to occurrence affects losses, would be expressed by a similar matrix with ones in the first row and zeroes elsewhere. Thus, for any given accident year, it is possible to calculate the inflation index for subsequent years of development by taking the relevant index as a row vector and multiplying it by the matrix WT. The result is a vector showing the weighted effect of the different years.

Shown as Exhibit III is a set of these matrices and a set of indices for medical and indemnity costs used to apply the procedure to the workers' compensation experience shown in Exhibits I and II. Also shown is the matrix of indices for the medical and indemnity costs obtained by the above procedure. Exhibit IV is similar to the author's exhibits since it shows the data developed without the inflation adjustments; the development using constant dollars (but at current year levels), and then the results obtained when a 10% rate of expected inflation is factored back in. This, in turn is contrasted to the results obtained by using the author's assumptions applied directly to the combined medical and indemnity payments. It can be seen that the reserves are higher in the latter case. Table II shows the results under inflation assumptions ranging from 7% to 15%.

In more formal terms, we can state that the procedure recommended in this review is as follows:

1) Determine (judgmentally or through research) the WT matrix showing the degree to which each year of inflation affects losses subsequent to their year of occurrence.

2) Multiply this matrix by the column vector consisting of the inflation indices for the period affecting each accident year. This consists of those years during which losses are incurred and paid out for the accident year. When this process has been completed for all accident years being studied, a matrix will be formed where each column will represent the weighted index for a particular year of development, and each column will represent the weighted index for a particular accident year as it matures. Each member of this matrix will be denoted as ι and the matrix itself will be called the IOTA matrix. See Exhibit III for an example of this procedure.

3) A new matrix is formed consisting of each member of the loss development matrix divided by the corresponding member of the IOTA matrix. This produces a matrix of paid losses expressed in constant dollar terms.

4) Loss reserve analysis is performed on this matrix of adjusted paid losses and loss payments are then projected for the remainder of each accident year. This can be thought of as "filling out the loss development triangle" and is illustrated in the author's paper by the area below the solid line in his Exhibit II.

   It is worth pointing out at this time that this process does more than just allow for simulating the effects of future inflation rates. The process of taking inflation out of loss development experience also removes many of the biases introduced by differential rates of inflation. Shown in Exhibit V are the different loss development factors obtained before and after adjusting for inflation. It is worth noting that the standard deviation of the loss development factors has been reduced in most cases. While this example is too restricted to be significant, it does suggest that removing biases introduced by inflation might lead to more accurate reserve projections.

5) The matrix resulting from projecting future losses after removing the effects of inflation can then be used to project future losses, given varying expected rates of inflation, by multiplying each member of this matrix by the corresponding member of the IOTA matrix. This, of course, is the reverse of the procedure used to remove the effects of inflation.

This procedure represents a more general case than that proposed by the author. The author's example can be treated within this procedure by using the identity matrix, WT, used in the medical payments example. No attempt has been made in this review to do more than suggest other possibilities for this matrix, but the question of how much inflation affects loss reserve development is a very important one and is worth further research.

Shown below are the reserves produced by the procedure described above under inflation rates ranging from 7% to 15%:

TABLE II

DEVELOPMENT OF WORKERS' COMPENSATION RESERVES

Expected Inflation	Indicated WC Reserve: Separate Development	Indicated WC Reserve: Combined Development	Difference
7.0%	$ 22202	$ 22082	-120
8.0	22478	22570	92
9.0	22759	23069	310
10.0	23047	23580	533
11.0	23339	24103	764
12.0	23636	24638	1002
13.0	23940	25185	1245
14.0	24250	25744	1494
15.0	24564	26317	1753
No Adjustment	22095	22039	-56

It can be seen that the differences between the two methods do not become pronounced until there is a fairly large difference between the underlying rate of inflation (approximately 7% in this case) and the expected rate of inflation.

The author also suggests that a similar procedure can be emplyed using incurred loss development data. It is hard to see how this can be accomplished, since reserves represent an estimate made at a particular point in time about losses which are expected to be paid at a variety of future dates. They may also include expectations about future rates of inflation. Such estimates can only be realized if the inflationary expectations underlying the reserves match the inflation rates which actually take place. No amount of moving a reserve up or down according to an index can adjust for this problem. The formula provided in the paper implicitly requires both paid loss and reserve forecasts and will only provide accurate results if the paid loss forecasts are accurate.

The author has provided a useful introduction to an important subject. This review has attempted to point out some of the difficulties involved in adjusting for the effects of inflation and has suggested some refinements which should allow these adjustments to be made under somewhat more general conditions than adopted in the paper.

WORKERS' COMPENSATION EXPERIENCE

Medical

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	1932	1193	288	155	113	92	61
1971	1668	940	214	84	103	50	
1972	1657	991	246	150	130		
1973	1797	1168	313	175			
1974	2132	1562	482				
1975	2463	1582					
1976	2439						

Indemnity

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	1561	2160	1291	798	459	257	259
1971	1334	1823	1032	651	317	304	
1972	1489	2019	1067	645	512		
1973	1447	2288	1441	750			
1974	1676	2866	1700				
1975	1997	2808					
1976	2033						

WORKERS' COMPENSATION EXPERIENCE

Medical Plus Indemnity

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	3493	3353	1579	953	572	349	320
1971	3002	2763	1246	735	420	354	
1972	3146	3010	1313	795	642		
1973	3244	3456	1754	925			
1974	3808	4428	2182				
1975	4460	4390					
1976	4472						

WORKERS' COMPENSATION EXPERIENCE

PROPORTION OF MEDICAL CLAIMS PAID

I. (Using paid loss projections not adjusted for inflation)

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	55.3%	35.6%	18.2%	16.3%	19.8%	26.4%	19.1%
1971	55.6	34.0	17.2	11.4	24.5	14.1	18.4
1972	52.7	32.9	18.7	18.9	20.2	18.8	17.9
1973	55.4	33.8	17.8	18.9	20.8	19.0	18.1
1974	56.0	35.3	22.1	16.7	21.6	19.5	18.8
1975	55.2	36.0	19.6	17.1	22.0	20.1	19.1
1976	54.5	34.1	18.7	16.3	21.1	19.1	18.2
Total	55.0%	34.5%	18.9%	16.5%	21.4%	19.6%	18.5%

II. (Using paid losses adjusted to current dollars)

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	55.6%	35.2%	18.0%	16.0%	18.6%	23.5%	16.1%
1971	55.9	34.4	17.3	11.0	22.4	12.2	15.9
1972	53.8	33.8	18.5	17.5	18.1	16.9	15.5
1973	57.1	34.2	17.0	17.3	19.3	17.2	15.7
1974	57.3	34.9	20.9	15.7	19.6	17.2	16.2
1975	55.7	35.2	18.6	15.7	19.8	17.4	16.1
1976	54.5	33.3	17.6	14.8	18.7	16.4	15.3
Total	55.7%	34.4%	18.3%	15.4%	19.5%	17.3%	15.8%

WORKERS' COMPENSATION EXPERIENCE

PROPORTION OF MEDICAL CLAIMS PAID

III. (Using paid loss projections including future inflation)

Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6
1970	55.3%	35.6%	18.2%	16.3%	19.8%	26.4%	19.1%
1971	55.6	34.0	17.2	11.4	24.5	14.1	19.2
1972	52.7	32.9	18.7	18.9	20.2	19.9	18.9
1973	55.4	33.8	17.8	18.9	21.9	20.2	19.4
1974	56.0	35.3	22.1	17.4	22.5	20.6	20.0
1975	55.2	36.0	19.9	17.6	22.8	20.8	20.0
1976	54.5	34.4	19.0	16.6	21.6	19.8	19.0
Total	55.0%	34.6%	19.0%	16.7%	21.9%	20.2%	19.4%

ADJUSTING LOSSES FOR THE EFFECTS OF INFLATION

I. Matrix of Weights Used for Indemnity Claims

Chron. Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7	AY+8
0	1.00	0.50	0.33	0.25	0.20	0.17	0.14	0.13	0.11
1		0.50	0.33	0.25	0.20	0.17	0.14	0.13	0.11
2			0.33	0.25	0.20	0.17	0.14	0.13	0.11
3				0.25	0.20	0.17	0.14	0.13	0.11
4					0.20	0.17	0.14	0.13	0.11
5						0.17	0.14	0.13	0.11
6							0.14	0.13	0.11
7								0.13	0.11
8									0.11

II. Matrix of Weights Used for Medical and Total Claims

Chron. Year	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7	AY+8
0	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1		1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2			1.00	0.00	0.00	0.00	0.00	0.00	0.00
3				1.00	0.00	0.00	0.00	0.00	0.00
4					1.00	0.00	0.00	0.00	0.00
5						1.00	0.00	0.00	0.00
6							1.00	0.00	0.00
7								1.00	0.00
8									1.00

ADJUSTING LOSSES FOR THE EFFECTS OF INFLATION

III. Indices Used

Year	Medical	Indemnity	Combined
1970	.653	.660	.657
1971	.695	.706	.702
1972	.717	.751	.740
1973	.746	.798	.780
1974	.815	.861	.845
1975	.913	.932	.926
1976	1.000	1.000	1.000

ADJUSTING LOSSES FOR THE EFFECTS OF INFLATION

IV. The IOTA Matrix for Medical payments assuming 10% inflation

Accident Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	.653	.695	.717	.746	.815	.913	1.000	1.100
1971	.695	.717	.746	.815	.913	1.000	1.100	1.210
1972	.717	.746	.815	.913	1.000	1.100	1.121	1.331
1973	.746	.815	.913	1.000	1.100	1.210	1.331	1.464
1974	.815	.913	1.000	1.100	1.210	1.331	1.464	1.611
1975	.913	1.000	1.100	1.210	1.331	1.464	1.611	1.772
1976	1.000	1.100	1.210	1.331	1.464	1.611	1.772	1.949

V. The IOTA Matrix for Indemnity payments assuming 10% inflation

Accident Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	.660	.683	.706	.729	.755	.785	.815	.851
1971	.706	.729	.752	.779	.810	.841	.878	.920
1972	.751	.775	.803	.836	.868	.907	.950	.998
1973	.798	.829	.864	.898	.938	.983	1.033	1.087
1974	.861	.896	.931	.973	1.021	1.072	1.128	1.189
1975	.932	.966	1.011	1.061	1.115	1.173	1.235	1.302
1976	1.000	1.050	1.103	1.160	1.221	1.286	1.355	1.429

VI. The IOTA Matrix for Total payments assuming 10% inflation

Accident Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	.657	.702	.740	.780	.845	.926	1.000	1.100
1971	.702	.740	.780	.845	.926	1.000	1.100	1.210
1972	.740	.780	.845	.926	1.000	1.100	1.210	1.331
1973	.780	.845	.926	1.000	1.100	1.210	1.331	1.464
1974	.845	.926	1.000	1.100	1.210	1.331	1.464	1.611
1975	.926	1.000	1.100	1.210	1.331	1.464	1.611	1.772
1976	1.000	1.100	1.210	1.331	1.464	1.611	1.772	1.949

WORKERS' COMPENSATION RESERVE PROJECTIONS

Ia. Medical: Without Inflation Adjustment

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	1932	3125	3413	3568	3681	3773	3834	3895
1971	1668	2608	2822	2906	3009	3059	3108	3158
1972	1657	2648	2894	3044	3174	3240	3292	3345
1973	1797	2965	3278	3453	3579	3654	3713	3772
1974	2132	3694	4176	4364	4524	4618	4693	4768
1975	2463	4045	4452	4653	4823	4924	5003	5083
1976	2439	3985	4386	4584	4752	4851	4929	5008

Total Reserve = 4849

Ib. Medical: In 1976 Dollars

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	2959	4675	5076	5284	5423	5524	5585	5646
1971	2399	3709	3996	4099	4212	4262	4309	4356
1972	2310	3639	3941	4105	4235	4300	4347	4395
1973	2410	3843	4186	4361	4485	4554	4604	5326
1974	2616	4327	4809	4990	5132	5210	5268	5163
1975	2698	4280	4662	4837	4975	5051	5107	5189
1976	2439	3877	4223	4381	4506	4575	4626	4677

Total Reserve = 4247

Ic. Medical: Adjusted to a future inflation rate of 10%

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	1932	3125	3413	3568	3681	3773	3834	3901
1971	1668	2608	2822	2906	3009	3059	3111	3168
1972	1657	2648	2894	3044	3174	3246	3303	3367
1973	1797	2965	3278	3453	3589	3672	3739	3814
1974	2132	3694	4176	4375	4547	4651	4736	4829
1975	2463	4045	4465	4677	4861	4972	5062	5161
1976	2439	4021	4440	4650	4833	4944	5034	5133

Total Reserve = 5193

WORKERS' COMPENSATION RESERVE PROJECTIONS

IIa. Indemnity: Without Inflation Adjustment

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	1561	3721	5012	5810	6269	6526	6785	7056
1971	1334	3157	4189	4840	5157	5461	5678	5905
1972	1489	3508	4575	5220	5732	6018	6257	6508
1973	1447	3735	5176	5926	6405	6725	6992	7272
1974	1676	4542	6242	7179	7760	8147	8471	8810
1975	1997	4805	6475	7447	8050	8452	8787	9139
1976	2033	5016	6760	7774	8403	8823	9173	9540

Total Reserve = 17246

IIb. Indemnity: In 1976 Dollars

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	2367	5531	7361	8456	9064	9392	9710	10040
1971	1889	4391	5764	6600	6992	7353	7602	7860
1972	1982	4589	5917	6689	7279	7599	7856	8123
1973	1814	4573	6242	7077	7595	7928	8197	8475
1974	1947	5144	6970	7942	8523	8898	9199	9512
1975	2142	5048	6717	7654	8214	8574	8865	9166
1976	2033	4912	6536	7447	7992	8343	8626	8919

Total Reserve = 16625

IIc. Indemnity: Adjusted to a future inflation rate of 10%

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	1561	3721	5012	5810	6269	6526	6785	7066
1971	1334	3157	4189	4840	5157	5461	5680	5917
1972	1489	3508	4575	5220	5732	6022	6266	6532
1973	1447	3735	5176	5926	6412	6739	7017	7319
1974	1676	4542	6242	7188	7781	8183	8523	8895
1975	1997	4805	6492	7486	8110	8532	8892	9284
1976	2033	5056	6848	7905	8570	9021	9405	9824

Total Reserve = 17854

WORKERS' COMPENSATION RESERVE PROJECTIONS

IIIa. Combined: Without Inflation Adjustment

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	3493	6846	8425	9378	9950	10299	10619	10948
1971	3002	5765	7011	7746	8166	8520	8785	9057
1972	3146	6156	7469	8264	8906	9255	9543	9839
1973	3244	6700	8454	9379	9982	10374	10696	11027
1974	3808	8236	10418	11548	12290	12772	13169	13577
1975	4460	8850	10951	12138	12919	13425	13842	14272
1976	4472	8981	11113	12318	13110	13624	14047	14483

Total Reserve = 22039

IIIb. Combined: In 1976 Dollars

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	5314	10088	12222	13443	14120	14497	14817	15143
1971	4274	8008	9605	10474	10928	11282	11531	11785
1972	4251	8108	9661	10520	11162	11492	11745	12004
1973	4157	8245	10140	11065	11636	11980	12244	12513
1974	4504	9287	11469	12531	13178	13567	13867	14172
1975	4818	9208	11174	12209	12838	13218	13509	13806
1976	4472	8673	10524	11499	12092	12449	12724	13004

Total Reserve = 18952

IIIc. Combined: Adjusted to a future inflation rate of 10%

Acc. Year	Development Year AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	AY+7
1970	3493	6846	8425	9378	9950	10299	10619	10978
1971	3002	5765	7011	7746	8166	8520	8794	9101
1972	3146	6156	7469	8264	8906	9269	9575	9920
1973	3244	6700	8454	9379	10007	10423	10774	11168
1974	3808	8236	10418	11586	12369	12887	13326	13817
1975	4460	8850	11013	12265	13102	13658	14127	14653
1976	4472	9093	11333	12631	13499	14074	14561	15107

Total Reserve = 23580

WORKERS' COMPENSATION LOSS DEVELOPMENT FACTORS

Ia. Medical: Without Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	1.617	1.092	1.045	1.032	1.025	1.016	1.016
1971	XXX	1.564	1.082	1.030	1.035	1.017		
1972	XXX	1.598	1.093	1.052	1.043			
1973	XXX	1.650	1.106	1.053				
1974	XXX	1.733	1.130					
1975	XXX	1.642						
Average	XXX	1.634	1.101	1.045	1.037	1.021	1.016	1.016

Ib. Medical: With Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	1.580	1.086	1.041	1.026	1.019	1.011	1.011
1971	XXX	1.546	1.077	1.026	1.028	1.012		
1972	XXX	1.575	1.083	1.042	1.032			
1973	XXX	1.595	1.089	1.042				
1974	XXX	1.654	1.111					
1975	XXX	1.586						
Average	XXX	1.589	1.089	1.038	1.029	1.015	1.011	1.011

WORKERS' COMPENSATION LOSS DEVELOPMENT FACTORS

IIa. Indemnity: Without Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	2.384	1.347	1.159	1.079	1.041	1.040	1.040
1971	XXX	2.367	1.327	1.155	1.065	1.059		
1972	XXX	2.356	1.304	1.141	1.098			
1973	XXX	2.581	1.386	1.145				
1974	XXX	2.710	1.374					
1975	XXX	2.406						
Average	XXX	2.467	1.348	1.150	1.081	1.050	1.040	1.040

IIb. Indemnity: With Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	2.337	1.331	1.149	1.072	1.036	1.034	1.034
1971	XXX	2.325	1.313	1.145	1.059	1.052		
1972	XXX	2.315	1.289	1.130	1.088			
1973	XXX	2.521	1.365	1.134				
1974	XXX	2.642	1.355					
1975	XXX	2.357						
Average	XXX	2.416	1.331	1.140	1.073	1.044	1.034	1.034

WORKERS' COMPENSATION LOSS DEVELOPMENT FACTORS

IIIa. Combined: Without Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	1.960	1.231	1.113	1.061	1.035	1.031	1.031
1971	XXX	1.920	1.216	1.105	1.054	1.043		
1972	XXX	1.957	1.213	1.106	1.078			
1973	XXX	2.065	1.262	1.109				
1974	XXX	2.163	1.265					
1975	XXX	1.984						
Average	XXX	2.008	1.237	1.108	1.064	1.039	1.031	1.031

IIIb. Combined: With Inflation Adjustment

Acc. Year	Development Year							
	AY+0	AY+1	AY+2	AY+3	AY+4	AY+5	AY+6	Final
1970	XXX	1.898	1.212	1.100	1.050	1.027	1.022	1.022
1971	XXX	1.874	1.199	1.090	1.043	1.032		
1972	XXX	1.907	1.192	1.089	1.061			
1973	XXX	1.983	1.230	1.091				
1974	XXX	2.062	1.235					
1975	XXX	1.911						
Average	XXX	1.939	1.213	1.093	1.052	1.030	1.022	1.022