TITLE: MEASURING THE IMPACT OF UNREPORTED PREMIUMS ON A REINSURERS' FINANCIAL RESULTS

AUTHOR: Douglas J. Collins

Mr. Collins is a Vice President of Tillinghast, Nelson & Warren, Inc. He is a graduate of Rensselaer Polytechnic Institute, with a Bachelor of Science degree in mathematics. He became a Fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries in 1977. He has served on the Examination Committee of the C.A.S.

ABSTRACT: A reinsurers' financial results are materially influenced by unreported premiums, and the losses and expenses related to these premiums. When unreported premiums and losses are estimated using underwriting year experience, an approximation is required to separate premiums earned and losses incurred before the reserve date from those earned and incurred after the reserve date. This paper presents a technique for approximating the earned portion of unreported premiums. It also demonstrates that financial results can vary significantly depending on the treatment of the earned and unearned portion of unreported premiums. A series of examples based on hypothetical data are used to show alternative estimates of underwriting income.

# MEASURING THE IMPACT OF UNREPORTED PREMIUMS ON A REINSURERS' FINANCIAL RESULTS

## INTRODUCTION

The analysis of reinsurers' financial results is complicated by the fact that both premiums and losses are subject to significant reporting lags. A further complication is the difficulty in quantifying the earned portion of unreported premiums. Reinsurers do not generally have sufficient information to calculate this quantity exactly. Thus, accounting practices vary as to the methodology for reflecting unreported premiums in financial statements.

This paper will present a technique for approximating unreported earned premiums. Several examples will then be reviewed in which calculations of unreported (IBNR) loss reserves are a function of expected losses. These examples will provide a comparison of ultimate loss estimates using alternative measures of unreported premiums in the expected loss calculation. The financial impact of the various assumptions will then be reviewed.

We will focus on the use of underwriting year experience to measure financial results. While accident year loss reserve estimates are required for Schedule P of the statutory annual statement, the use of accident year data has several disadvantages that can create problems for a reinsurer seeking to accurately measure its financial position.

Accident year loss estimates are usually compared to premiums reported and earned during the accident year. Due to premium reporting lags, this comparison does not match premiums and losses from the same policies. Thus, accident year loss ratios do not always provide a meaningful measure of underwriting results. Another disadvantage is that reinsurers can not always identify the proper accident year of a claim payment or reserve, since this information may not be supplied by ceding carriers. Despite these problems, an estimated accident year allocation of statistics is often the basis for reinsurers' loss reserves, due to the reporting requirements for Schedule P. However, if loss reserves are to be matched with an appropriate measure of unreported premiums, a supplement to calendar-accident year statistics is required.

A policy year type exposure period is used quite often by reinsurers since it provides an appropriate matching of premiums and losses, and also provides the data needed for calculating unreported premiums. Reinsurers usually use the term underwriting or contract year, rather than policy year, to reflect the difference between reinsurance and primary insurance contracts. Since some reinsurance contracts cover underlying policies written throughout the contract period (i.e., they cover the reinsured's policy year), an underwriting year normally includes parts of three accident years (or more if policy terms exceed twelve months). For example, a reinsurance contract written on July 1, 1983 might cover underlying policies written through June 30, 1984 which would cover losses occurring through June 30, 1985. All of the premiums and losses from this contract would be included in underwriting year 1983.

The measurement of unreported premium reserves can be accomplished by multiplicative projection techniques using historical underwriting year premium development patterns. This unreported premium may include the following components.

1. Premiums which have been written with effective dates prior to the reserve date, but which have not yet been reported. These premiums have an unearned and an earned portion. The earned but not reported premium is often referred to as EBNR.

2. Premiums which will be written with effective dates after the reserve date but within the exposure period being projected. For example, policies written after 6/30/84, which might be included in a projection of ultimate premiums for underwriting year 1984 as of 6/30/84.

The following section will describe a simple procedure for estimating the component portions of an unreported premium reserve.

## UNREPORTED PREMIUM RESERVES

Exhibit 1 shows the underlying data for Sebago Re, a hypothetical growing young reinsurance company. We project that Sebago Re will ultimately collect premiums of $15 million for underwriting years 1980 to 1984. As of 6/30/84, they have collected written premiums of $9 million. Thus, their total unreported premiums are $6 million. Of

course, the portion of these unreported premiums that will be written with effective dates after 6/30/84, should not influence Sebago Re's 6/30/84 financial statement. The first task is to estimate this portion. The assumption that policies are written uniformly throughout the year is usually not appropriate for a reinsurer, but the exact distribution of policy effective dates for underwriting year 1984 is unknown. As an estimate Sebago Re could sample the distribution of premiums by effective month in prior underwriting years. Such an analysis would typically produce a premium distribution such as the following:

| Policy Effective Month | Portion of Premiums Written |
|---|---|
| January - March | 57% |
| April - June | 18 |
| July - September | 21 |
| October - December | 4 |
| | 100 |

Assuming that this is the distribution that Sebago Re finds, then 25% of the ultimate premium for underwriting year 1984, or $1.25 million, has not yet been written.

The remaining $4.75 million of unreported premium contains an earned and an unearned portion. Calculating these portions exactly would require that Sebago Re know the ultimate premium for each policy that it has written with an effective date of 6/30/84 or prior. Based on each policy's coverage provisions, Sebago Re could then estimate the earned portion. However, it is not usually feasible for a reinsurer to calculate reasonable ultimate premiums for each policy. As an alternative, the earned portion can be estimated on an aggregate basis.

The earning of premium on a reinsurance contract can follow different patterns, depending on the type of contract. The determining factor is the provision for coverage of losses. The following are common types of coverage found in reinsurance.

1. Occurrence - The reinsured is indemnified for a defined share of all claims occurring during the reinsurance contract period.

2. Claims-made - The reinsured is indemnified for a defined share of all claims reported to it during the reinsurance contract period.

3. Claims-paid - The reinsured is indemnified for a defined share of all claims paid during the reinsurance contract period.

4. Risks attaching - The reinsured is indemnified for a defined share of all claims occurring on policies that it writes during the reinsurance contract period.

Premiums are usually earned on a pro rata basis over the policy term for types 1 through 3 above. The underlying assumption is that the occurrence, reporting, and payment of losses are evenly distributed throughout the year. For type 4, if the policies written by the reinsured are earned on a pro-rata basis, the reinsurer's contract would be earned according to the parallelogram rule. That is, the earning of premium on a twelve month reinsurance contract would take

24 months, as the underlying policies are written and earned. If the reinsured's policies include coverage on a risks-attaching basis, the premium earning would be extended further. For simplicity we will assume that Sebago Re's policies are earned either by the pro-rata or parellelogram rules. A sampling of the contract provisions could easily be used to determine premium volumes written by contract type. Preferably, reserving data should be segregated so that ultimate premiums and losses are projected separately for each type. In order to simulate a mixed book of business for this example, we will combine the two types into one calculation.

Exhibit 2, Sheet 2, shows the earning patterns that would result from the pro-rata and parallelogram rules. In both cases we have assumed that all policy terms are twelve months. Assuming that 50% of Sebago Re's business is in each type, their average earning pattern is shown in column (4). On Sheet 1 of Exhibit 2, the earning pattern is combined with Sebago Re's monthly distribution of policy effective dates to calculate a weighted average earned factor for each underwriting year. These factors represent the earned portion of ultimate written premiums for each underwriting year as of 6/30/84. Averages could be calculated for any other reserving date using a similar procedure.

The top half of Exhibit 3 derives the earned portion of the unreported premium. We now have the following measures of premiums for Sebago Re.

| | | |
|---|---|---|
| 1. | Reported written premium as of 6/30/84 | $ 9,000,000 |
| 2. | Reported earned premium as of 6/30/84 | 7,950,000 |
| 3. | Reported unearned premium as of 6/30/84 (1-2) | 1,050,000 |
| 4. | Ultimate written premium | 15,000,000 |
| 5. | Portion of 4. written after 6/30/84 | 1,250,000 |
| 6. | Adjusted ultimate written premium (4-5) | 13,750,000 |
| 7. | 6/30/84 earned ultimate premium | 10,395,700 |
| 8. | Unreported earned premium (7-2) | 2,445,700 |
| 9. | Unreported unearned premium (6-7-3) | 2,304,300 |

Thus, policies written through 6/30/84 are estimated to ultimately bring in premiums of $13,750,000. Of this total $10,395,700 represents exposure that has been earned as of 6/30/84. The remaining $3,354,300 is unearned at that date. The $6 million of unreported premium consists of: $2,445,700 earned, $2,304,300 unearned, and $1,250,000 unwritten. The results of these calculations are sensitive to the hypothetical amounts of written, earned, and ultimate premiums. The selected figures are believed to be reasonable, but the breakdown of unreported premiums will vary significantly among reinsurers and at different points in time.

## IBNR RESERVES

In order to complete the example (and Exhibit 3) we need to calculate Sebago Re's IBNR reserves. We have selected a technique described by

Bornhuetter and Ferguson[1] that is well suited to long-tailed lines such as reinsurance. For this technique, two parameters are required to calculate the IBNR reserve: an initial expected loss ratio and an expected loss reporting pattern. The IBNR reserve is equal to the product of expected ultimate losses and the expected percentage unreported as of the reserve date.

As shown on Exhibit 1, reported losses to date total approximately $4.3 million. Applying appropriate development factors to these losses would indicate an ultimate loss level of $14 million. However, due to the large development factors the resulting ultimate loss ratios are not consistent with our expectations. The Bornhuetter-Ferguson technique might be chosen in this case to reduce the inconsistency. There are four alternative premium bases that could be used in this calculation.

Ultimate Reserves

Exhibit 4 shows a reserve calculation based on projected ultimate premiums. The initial expected loss ratios in Column 3 will be used in each example that follows. Their selection may be assumed to have been based on reasonable actuarial judgments. The loss reporting pattern is based on the development factors shown with the underlying data (e.g., in Column (5): 83.33% = 1.00 ÷ 1.20). The estimated ultimate losses Column (10) reflect the combination of actual reported losses and expected unreported (IBNR) losses.

[1]Bornhuetter, R. L. and Ferguson, R. W. "The Actuary and IBNR". Proceedings of the Casualty Actuarial Society, LIX, 1972, p. 181.

This calculation results in an overstated IBNR reserve since it reflects premiums written and losses incurred after 6/30/84. It is shown for comparison with the projections of underlying data in Exhibit 1.

Adjusted Ultimate Reserves

Exhibit 5 includes an adjustment of underwriting year 1984 premiums to reflect only those written as of 6/30/84. The expected percentage of losses reported for 1984 is also adjusted to reflect writings as of 6/30/84. That is, since only 75% of the ultimate premiums have been written as of June, the indicated percent reported is divided by .75. The purpose of matching the reporting pattern and premium adjustments is to maintain the same expected reported losses. Note that Column (7) will remain unchanged in each example.

This example still results in an overstated IBNR since it reflects premiums earned and losses incurred after 6/30/84. However, it does provide a meaningful estimate of Sebago Re's financial position after all of its current underwriting commitments have run off.

Ultimate Earned Reserves

The 6/30/84 ultimate earned premiums derived in Exhibit 3 are used as the base to calculate IBNR on Exhibit 6. The loss reporting pattern requires adjustment for underwriting years 1982 to 1984 to reflect the difference between ultimate earned and ultimate written premium. This adjustment is similar to that described above. In this case, the percent reported is divided by the ratio of ultimate earned premiums to ultimate written premiums. Thus, the percentage reported for

underwriting year 1984 is 2.00% + ($973,000 + $5,000,000), or 10.28%. The other percentages in Column (5) are calculated similarly.

Theoretically, this example provides IBNR reserves reflecting exposures earned and incurred prior to 6/30/84. In this respect, it would be the appropriate figure for Sebago Re to carry in its statutory financial statements.

Current Earned Reserves

Exhibit 7 shows a reserve calculation based on the reported earned premiums as of 6/30/84. The initial expected loss ratios and the loss reporting pattern are the same as before, with similar adjustments to the reporting pattern.

The calculation on Exhibit 7 results in an understated IBNR because it does not reflect losses relating to premiums that are earned but unbooked as of 6/30/84. Sebago Re might use this IBNR in their financial statements assuming that the understatement of liabilities would be offset by an understatement of assets. This assumption requires that the unreported premium is equal to the unreported losses and expenses relating to that premium. In times of poor underwriting results, the unbooked liability will exceed the unbooked asset. The extent of this shortfall for Sebago Re is estimated on Exhibit 3.

Returning to the lower portion of Exhibit 3, we have assumed that expenses associated with unreported premiums will average 30%. This figure is intended to include only those expenses, such as commissions, brokerage, and taxes, that would be directly incurred as

a result of receiving the premium. The net additional liability in Column (11) is actually the combination of one asset and three liabilities: unreported written premium, unreported unearned premium, and loss and expense liabilities associated with the unreported earned premium. This net liability represents the difference between financial results calculated on a current earned basis and financial results calculated on an ultimate earned basis.

A comparison of inception to date underwriting results under three alternative IBNR calculations is shown below. The premiums and losses are from Exhibits 5-7; the total expense ratio is assumed to be 35%.

| | Adjusted Ultimate | Ultimate Earned | Current Earned |
|---|---|---|---|
| Premiums | $13,750,000 | $10,395,700 | $7,950,000 |
| Underwriting Expenses | 4,812,500 | 3,638,495 | 2,782,500 |
| Ultimate Losses | 13,006,666 | 9,652,696 | 7,261,666 |
| Underwriting Profit | (4,069,166) | (2,895,491) | (2,094,166) |
| Combined Ratio | 129.6% | 127.9% | 126.3% |

This comparison indicates the impact of poor underwriting results on these calculations. The range of combined ratios spans 3.3%. However, the underwriting loss varies by almost $2 million, which would be 10% to 20% of surplus, assuming that Sebago Re is a small reinsurer with surplus of $10 million to $20 million.

The same comparison for a reinsurer with more acceptable underwriting results would have a smaller range. If Sebago Re's reported losses

and IBNR are reduced by 25%, the underwriting results would be as follows.

| | Adjusted Ultimate | Ultimate Earned | Current Earned |
|---|---|---|---|
| Ultimate Losses | $9,755,000 | $7,239,522 | $5,446,250 |
| Underwriting Profit | (817,500) | (482,317) | (278,750) |
| Combined Ratio | 105.9% | 104.6% | 103.5% |

The combined ratio swing is reduced to 2.4%, and the underwriting loss range is only $538,750, or 2.7% to 5.4% of the surplus assumptions mentioned above. However, this difference could still be material, especially to a reinsurer that writes at a more typical premium to surplus ratio of 1:1 or higher.

If further improvements in underwriting results were assumed, the range would continue to decline. A reinsurer that writes consistently at a 100% combined ratio would have zero underwriting profit using each method. Thus, the unreported premium would have no impact on the income or surplus of such a reinsurer. Reinsurers writing below 100% would be understating income and surplus by ignoring unreported premiums.

## CONCLUSIONS

Loss reserves are intended to reflect all occurrences prior to the reserve date. When underwriting year data is used in reserving, an approximation is required to estimate the portion of each year's losses that have occurred. Similarly, an approximation of the

unreported premium reserve is required, to determine the amount that is earned prior to the reserve date. We have seen that financial estimates which exclude the unreported premium and those which include the unearned premium can differ materially from estimates based on the ultimate earned.

The alternative of using accident year data may reduce the uncertainty concerning losses which occur prior to the reserve date. However, calendar-accident year data provides no means for calculating unreported premiums, and also can produce distorted measures of loss ratios due to mismatching of premiums and losses.

It should be noted that if financial results are measured over a complete underwriting cycle, the impact of unreported premiums is less severe than at the peaks and troughs. However, the impact will almost always be material.

SEBAGO RE

UNDERLYING DATA

| Underwriting Year | Earned Premiums As of 6/30/84 | Written Premiums As of 6/30/84 | Development Factor to Ultimate | Estimated Ultimate Written Premiums (3) x (4) |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| 1980 | $1,000,000 | $1,000,000 | 1.000 | $ 1,000,000 |
| 1981 | 2,000,000 | 2,000,000 | 1.000 | 2,000,000 |
| 1982 | 2,450,000 | 2,500,000 | 1.200 | 3,000,000 |
| 1983 | 2,100,000 | 2,500,000 | 1.600 | 4,000,000 |
| 1984 | 400,000 | 1,000,000 | 5.000 | 5,000,000 |
| Total | 7,950,000 | 9,000,000 | | 15,000,000 |

| Underwriting Year | Incurred Losses As of 6/30/84 | Development Factor to Ultimate | Estimated Ultimate Incurred Losses (6) x (7) | Estimated Ultimate Loss Ratio (8) / (5) |
|---|---|---|---|---|
| (1) | (6) | (7) | (8) | (9) |
| 1980 | $ 583,333 | 1.200 | $ 700,000 | .700 |
| 1981 | 1,333,333 | 1.500 | 2,000,000 | 1.000 |
| 1982 | 1,200,000 | 2.000 | 2,400,000 | .800 |
| 1983 | 1,100,000 | 4.000 | 4,400,000 | 1.100 |
| 1984 | 90,000 | 50.000 | 4,500,000 | .900 |
| Total | 4,306,666 | | 14,000,000 | .933 |

SEBAGO RE

Average Earned Premium Factors
By Underwriting Year

| Policy Effective Month (1) | Estimated Premium Distribution (2) | Earned Premium Factor* (3) |
|---|---|---|
| 1/82 - 7/82 | 93% | 1.0000 |
| 8/82 | 2 | .9983 |
| 9/82 | 1 | .9931 |
| 10/82 | 2 | .9844 |
| 11/82 | 1 | .9722 |
| 12/82 | 1 | .9566 |
| | 100 | .9989 |
| 1/83 | 54 | .9375 |
| 2/83 | 1 | .9149 |
| 3/83 | 2 | .8889 |
| 4/83 | 11 | .8594 |
| 5/83 | 2 | .8264 |
| 6/83 | 5 | .7899 |
| 7/83 | 18 | .7500 |
| 8/83 | 2 | .6684 |
| 9/83 | 1 | .5903 |
| 10/83 | 2 | .5156 |
| 11/83 | 1 | .4444 |
| 12/83 | 1 | .3767 |
| | 100 | .8565 |
| 1/84 | 54 | .3125 |
| 2/84 | 1 | .2517 |
| 3/84 | 2 | .1944 |
| 4/84 | 11 | .1406 |
| 5/84 | 2 | .0903 |
| 6/84 | 5 | .0434 |
| 7/84 - 12/84 | 25 | .0000 |
| | 100 | .1946 |

*Assumes policies effective on the 1st day of each month. Subtotals are weighted averages using Column (2) as weights.

SEBAGO RE

## Earned Premium Factors

| No. of Months From Policy Effective Date (1) | Pro-Rata Earning (2) | Parallelogram Earning* (3) | Average [(2)+(3)] ÷ 2.0 (4) |
|---|---|---|---|
| 1 | .0833 | .0035 | .0434 |
| 2 | .1667 | .0139 | .0903 |
| 3 | .2500 | .0313 | .1406 |
| 4 | .3333 | .0556 | .1944 |
| 5 | .4167 | .0868 | .2517 |
| 6 | .5000 | .1250 | .3125 |
| 7 | .5833 | .1701 | .3767 |
| 8 | .6667 | .2222 | .4444 |
| 9 | .7500 | .2813 | .5156 |
| 10 | .8333 | .3472 | .5903 |
| 11 | .9167 | .4201 | .6684 |
| 12 | 1.0000 | .5000 | .7500 |
| 13 | 1.0000 | .5799 | .7899 |
| 14 | 1.0000 | .6528 | .8264 |
| 15 | 1.0000 | .7188 | .8594 |
| 16 | 1.0000 | .7778 | .8889 |
| 17 | 1.0000 | .8299 | .9149 |
| 18 | 1.0000 | .8750 | .9375 |
| 19 | 1.0000 | .9132 | .9566 |
| 20 | 1.0000 | .9444 | .9722 |
| 21 | 1.0000 | .9688 | .9844 |
| 22 | 1.0000 | .9861 | .9931 |
| 23 | 1.0000 | .9965 | .9983 |
| 24 | 1.0000 | 1.0000 | 1.0000 |

*Assumes underlying policies are evenly distributed throughout the year. Figures are calculated by the following formula:

$$\text{Earned Factor} = M^2 \div 288, \text{ for } M \leq 12$$

$$= 1 - [(24 - M)^2 \div 288], \text{ for } M > 12$$

Where M = Number of months from policy effective date.

SERAGO RE

CALCULATION OF NET ADDITIONAL LIABILITY

| Underwriting Year | Ultimate Premium | 6/30/84 Earned Factor | 6/30/84 Ultimate Earned Premium (2) X (3) | 6/30/84 Reported Earned Premium | 6/30/84 Unreported Earned Premium (4) - (5) |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1980 | $ 1,000,000 | 1.0000 | $ 1,000,000 | $1,000,000 | $ 0 |
| 1981 | 2,000,000 | 1.0000 | 2,000,000 | 2,000,000 | 0 |
| 1982 | 3,000,000 | .9989 | 2,996,700 | 2,450,000 | 546,700 |
| 1983 | 4,000,000 | .8565 | 3,426,000 | 2,100,000 | 1,326,000 |
| 1984 | 5,000,000 | .1946 | 973,000 | 400,000 | 573,000 |
| Total | 15,000,000 | | 10,395,700 | 7,950,000 | 2,445,700 |

| Underwriting Year | Expense Ratio | Initial Expected Loss Ratio | Unreported Expenses (6) x (7) | Additional Unreported Losses (6) x (8) | Net Additional Liability (9)+(10)-(6) |
|---|---|---|---|---|---|
| (1) | (7) | (8) | (9) | (10) | (11) |
| 1980 | .30 | .800 | $ 0 | $ 0 | $ 0 |
| 1981 | .30 | .850 | 0 | 0 | 0 |
| 1982 | .30 | .900 | 164,010 | 492,030 | 109,340 |
| 1983 | .30 | 1.000 | 397,800 | 1,326,000 | 397,800 |
| 1984 | .30 | 1.000 | 171,900 | 573,000 | 171,900 |
| Total | | | 733,710 | 2,391,030 | 679,040 |

SEBAGO RE

Ultimate Written Premium Basis

Projected Ultimate Losses Using Bornhuetter-Ferguson Technique
On Incurred Losses
as of 6/30/84

| Underwriting Year | Ultimate Premium | Initial Expected Loss Ratio | Initial Expected Losses (2) x (3) | Expected Percentage | |
|---|---|---|---|---|---|
| | | | | Reported | Unreported |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1980 | $ 1,000,000 | .800 | $ 800,000 | 83.33 | 16.67 |
| 1981 | 2,000,000 | .850 | 1,700,000 | 66.67 | 33.33 |
| 1982 | 3,000,000 | .900 | 2,700,000 | 50.00 | 50.00 |
| 1983 | 4,000,000 | 1.000 | 4,000,000 | 25.00 | 75.00 |
| 1984 | 5,000,000 | 1.000 | 5,000,000 | 2.00 | 98.00 |
| Total | 15,000,000 | | 14,200,000 | | |

| Underwriting Year | Expected Reported Losses (4) x (5) | Actual Reported Losses | Expected Unreported Losses (4) x (6) | Estimated Ultimate Losses (8) + (9) | Estimated Ultimate Loss Ratio (10) / (2) |
|---|---|---|---|---|---|
| (1) | (7) | (8) | (9) | (10) | (11) |
| 1980 | $ 666,667 | $ 583,333 | $ 133,333 | $ 716,666 | .717 |
| 1981 | 1,133,333 | 1,333,333 | 566,667 | 1,900,000 | .950 |
| 1982 | 1,350,000 | 1,200,000 | 1,350,000 | 2,550,000 | .850 |
| 1983 | 1,000,000 | 1,100,000 | 3,000,000 | 4,100,000 | 1.025 |
| 1984 | 100,000 | 90,000 | 4,900,000 | 4,990,000 | .998 |
| Total | 4,250,000 | 4,306,666 | 9,950,000 | 14,256,666 | .950 |

SEBAGO RE

Adjusted Ultimate Written Premium Basis

Projected Ultimate Losses Using Bornhuetter-Ferguson Technique
On Incurred Losses
as of 6/30/84

| Underwriting Year | Adjusted Ultimate Premium | Initial Expected Loss Ratio | Initial Expected Losses (2) x (3) | Expected Percentage | |
|---|---|---|---|---|---|
| | | | | Reported | Unreported |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1980 | $ 1,000,000 | .800 | $ 800,000 | 83.33 | 16.67 |
| 1981 | 2,000,000 | .850 | 1,700,000 | 66.67 | 33.33 |
| 1982 | 3,000,000 | .900 | 2,700,000 | 50.00 | 50.00 |
| 1983 | 4,000,000 | 1.000 | 4,000,000 | 25.00 | 75.00 |
| 1984 | 3,750,000 | 1.000 | 3,750,000 | 2.67 | 97.33 |
| Total | 13,750,000 | | 12,950,000 | | |

| Underwriting Year | Expected Reported Losses (4) x (5) | Actual Reported Losses | Expected Unreported Losses (4) x (6) | Estimated Ultimate Losses (8) + (9) | Estimated Ultimate Loss Ratio (10) / (2) |
|---|---|---|---|---|---|
| (1) | (7) | (8) | (9) | (10) | (11) |
| 1980 | $ 666,667 | $ 583,333 | $ 133,333 | $ 716,666 | .717 |
| 1981 | 1,133,333 | 1,333,333 | 566,667 | 1,900,000 | .950 |
| 1982 | 1,350,000 | 1,200,000 | 1,350,000 | 2,550,000 | .850 |
| 1983 | 1,000,000 | 1,100,000 | 3,000,000 | 4,100,000 | 1.025 |
| 1984 | 100,000 | 90,000 | 3,650,000 | 3,740,000 | .997 |
| Total | 4,250,000 | 4,306,666 | 8,700,000 | 13,006,666 | .946 |

SEBAGO RE

Ultimate Earned Premium Basis

Projected Ultimate Losses Using Bornhuetter-Ferguson Technique
On Incurred Losses
as of 6/30/84

| Underwriting Year | Ultimate Earned Premium | Initial Expected Loss Ratio | Initial Expected Losses (2) x (3) | Expected Percentage | |
|---|---|---|---|---|---|
| | | | | Reported | Unreported |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1980 | $ 1,000,000 | .800 | $ 800,000 | 83.33 | 16.67 |
| 1981 | 2,000,000 | .850 | 1,700,000 | 66.67 | 33.33 |
| 1982 | 2,996,700 | .900 | 2,697,030 | 50.06 | 49.94 |
| 1983 | 3,426,000 | 1.000 | 3,426,000 | 29.19 | 70.81 |
| 1984 | 973,000 | 1.000 | 973,000 | 10.28 | 89.72 |
| Total | 10,395,700 | | 9,596,030 | | |

| Underwriting Year | Expected Reported Losses (4) x (5) | Actual Reported Losses | Expected Unreported Losses (4) x (6) | Estimated Ultimate Losses (8) + (9) | Estimated Ultimate Loss Ratio (10) / (2) |
|---|---|---|---|---|---|
| (1) | (7) | (8) | (9) | (10) | (11) |
| 1980 | $ 666,667 | $ 583,333 | $ 133,333 | $ 716,666 | .717 |
| 1981 | 1,133,333 | 1,333,333 | 566,667 | 1,900,000 | .950 |
| 1982 | 1,350,000 | 1,200,000 | 1,347,030 | 2,547,030 | .850 |
| 1983 | 1,000,000 | 1,100,000 | 2,426,000 | 3,526,000 | 1.029 |
| 1984 | 100,000 | 90,000 | 873,000 | 963,000 | .990 |
| Total | 4,250,000 | 4,306,666 | 5,346,030 | 9,652,696 | .929 |

SEBAGO RE

Reported Earned Premium Basis

Projected Ultimate Losses Using Bornhuetter-Ferguson Technique
On Incurred Losses
as of 6/30/84

| Underwriting Year | Reported Earned Premium | Initial Expected Loss Ratio | Initial Expected Losses (2) x (3) | Expected Percentage | |
|---|---|---|---|---|---|
| | | | | Reported | Unreported |
| (1) | (2) | (3) | (4) | (5) | (6) |
| 1980 | $1,000,000 | .800 | $ 800,000 | 83.33 | 16.67 |
| 1981 | 2,000,000 | .850 | 1,700,000 | 66.67 | 33.33 |
| 1982 | 2,450,000 | .900 | 2,205,000 | 61.22 | 38.78 |
| 1983 | 2,100,000 | 1.000 | 2,100,000 | 47.62 | 52.38 |
| 1984 | 400,000 | 1.000 | 400,000 | 25.00 | 75.00 |
| Total | 7,950,000 | | 7,205,000 | | |

| Underwriting Year | Expected Reported Losses (4) x (5) | Actual Reported Losses | Expected Unreported Losses (4) x (6) | Estimated Ultimate Losses (8) + (9) | Estimated Ultimate Loss Ratio (10) / (2) |
|---|---|---|---|---|---|
| (1) | (7) | (8) | (9) | (10) | (11) |
| 1980 | $ 666,667 | $ 583,333 | $ 133,333 | $ 716,666 | .717 |
| 1981 | 1,133,333 | 1,333,333 | 566,667 | 1,900,000 | .950 |
| 1982 | 1,350,000 | 1,200,000 | 855,000 | 2,055,000 | .839 |
| 1983 | 1,000,000 | 1,100,000 | 1,100,000 | 2,200,000 | 1.048 |
| 1984 | 100,000 | 90,000 | 300,000 | 390,000 | .975 |
| Total | 4,250,000 | 4,306,666 | 2,955,000 | 7,261,666 | .913 |