A GUIDE TO THE EVALUATION OF PROPERTY–LIABILITY REINSURERS UNDER THE NAIC INSURANCE REGULATORY INFORMATION SYSTEM

Reinsurance Association of America

INTRODUCTION

Companies writing reinsurance are involved in the highest risk sector of the property-liability business. Commercial lines and liability exposures, the most difficult lines on a primary basis, are the types of risks most often reinsured. Because of this, the financial standards established for reinsurers should be carefully monitored.

BACKGROUND

In April 1989 the Reinsurance Association of America (RAA) published the first edition of its guide to the evaluation of property-liability reinsurers under the NAIC Insurance Regulatory Information System (IRIS). The project was undertaken in response to several factors: (1) requests from insurance regulators for information which would expedite the early identification of financially troubled reinsurers; (2) peculiar results evidenced by reinsurers under financial evaluation programs such as IRIS; and (3) the desire to encourage the use by regulators of meaningful standards for analyzing reinsurers. The current edition updates the 1989 report and includes data on the reinsurance industry's performance during the period 1985 through 1989.

PROCEDURES

IRIS Ratios were calculated for each of the years 1985 through 1989 to determine the following statistical information on the reinsurance industry:

1. the weighted average ratios (data aggregated, and then ratios computed);
2. the mean ratios (ratios computed by company, aggregated, and then divided by the number of companies); and
3. an evaluation of each ratio at 10, 25, 50, 75, and 90th percentiles (the 50th percentile representing the median).

The second and third computations exclude the unusual ratio values of -99 and 999 which appear when "normal" results cannot be calculated. The NAIC, in preparing its IRIS report, also computes the industry-wide mean and median with these unusual values excluded, noting that this makes the results more realistic.

A five year history of ratios for the reinsurance industry on a weighted, mean and percentile basis precedes the discussion of each ratio. The results are also compiled in Exhibit I.

Exhibit II represents a summary of 1989 mean and median ratios for reinsurers and for the total insurance industry.

APPLICATION

While these ratios can be a helpful regulatory tool, their scope and applicability must be considered. Regulatory officials must consider the status of the reinsurance market as a whole when evaluating an individual company's performance and financial solvency. Also, the ratio results must be evaluated over a number of years, and some ratios are not valid for evaluating the financial performance of new market entrants. Finally, any special transactions or mix of business changes distorting this analysis must be considered.

Although the report contains comments on several concepts applicable to the ratios, the reader should be aware that not all conceivable issues can be addressed in this limited analysis.

Among other issues which the reader may want to consider are:

- the effect of the current trend toward consolidation in the industry;
- the effect of large volume transactions;
- the effect of federal income taxes.

RATIO 1

PREMIUM TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	157.2	143.1	128.0	100.0	86.0

MEAN

	1985	1986	1987	1988	1989
RATIO	135.4	129.9	109.2	92.2	92.4

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	35.0	26.3	23.6	22.7	25.4
25TH PCTL	66.7	76.0	71.5	48.9	49.9
50TH PCTL	131.8	128.4	108.3	88.1	76.5
75TH PCTL	183.4	171.1	150.6	119.8	111.5
90TH PCTL	238.7	218.2	174.8	157.2	150.1

Source: A.M. Best Company - By Permission

The premium to surplus ratio should generally be lower for reinsurers than for primary companies. The difference between the values for the total industry and reinsurers reflects the higher risk potential assumed by reinsurers; however, a reinsurer assuming mostly proportional (pro-rata) business could have results similar to those of its ceding insurers.

It is also possible for a reinsurer to be overleveraged without having an unusual ratio value. Reinsurance is inherently riskier in part because of the protracted loss development. As a result, for non-proportional (excess of loss) reinsurance, the magnitude of risk per dollar of premium differs significantly from that at the primary level. In addition, certain lines of non-proportional business will develop more slowly than others.

Changes to the Statutory Annual Statement implemented in 1988 provide new information which is helpful in the analysis of an insurer's premium to surplus ratio. Reinsurers, and primary insurers assuming reinsurance, report premiums and losses for proportional business on lines 1-29 of the Underwriting and Investment Exhibit. Non-proportional business is reported on lines 30A, 30B, and 30C for property, casualty, and other reinsurance respectively. The degree of risk inherent in the different lines of business should be considered when evaluating a particular company.

Over time, the premium to surplus ratios of both the total insurance industry and the reinsurance industry will vary with market conditions. These conditions do not necessarily have the same effect on reinsurers as on the total industry.

RATIO 2

CHANGE IN WRITINGS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	37.8	48.3	2.0	-9.9	-2.1

MEAN

	1985	1986	1987	1988	1989
RATIO	45.9	68.8	19.3	12.9	12.2

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	-25.8	-13.4	-25.2	-29.1	-22.0
25TH PCTL	5.2	0.1	-13.7	-20.3	-10.9
50TH PCTL	34.6	31.1	3.3	-3.4	1.1
75TH PCTL	67.8	70.4	18.9	11.4	21.2
90TH PCTL	109.2	174.9	62.9	58.6	46.3

Source: A.M. Best Company - By Permission

Changes in writings often reflect market conditions. Characteristically, reinsurance premiums increase more rapidly than primary premiums in hard markets and decrease more rapidly in soft markets. When using this ratio, it is important to distinguish between the portion of the change attributable to changing rate levels and the portion attributable to changing risk exposure. For example, the unprecedented increase in writings by reinsurers in 1985-1986 reflected market conditions in that period and predominantly represented rate increases rather than increases in exposure.

For an individual insurance or reinsurance company, rapid increases in premium relative to the appropriate average may be an indication of cash flow or other problems. For this reason, special attention should be given to organizations varying markedly from median test results in either the industry or the reinsurance segment as is applicable.

RATIO 3

SURPLUS AID TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	2.3	1.2	0.6	0.5	0.5

MEAN

	1985	1986	1987	1988	1989
RATIO	2.0	1.0	0.7	0.6	0.6

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	0.0	0.0	0.0	0.0	0.0
25TH PCTL	0.0	0.0	0.0	0.0	0.0
50TH PCTL	0.1	0.0	0.0	0.0	0.0
75TH PCTL	1.8	0.6	0.4	0.5	0.5
90TH PCTL	8.4	3.0	1.4	1.3	1.4

Source: A.M. Best Company - By Permission

Surplus aid has not generally been a factor in the reinsurance industry.

RATIO 4

TWO-YEAR OVERALL OPERATING RATIO

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	105.1	94.3	87.8	84.4	83.0

MEAN

	1985	1986	1987	1988	1989
RATIO	99.7	88.4	87.3	87.5	86.7

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	78.0	32.3	70.2	71.7	71.8
25TH PCTL	94.4	84.9	80.8	79.5	82.0
50TH PCTL	101.1	93.0	87.1	85.1	86.9
75TH PCTL	112.2	99.5	93.3	90.6	92.5
90TH PCTL	124.6	119.9	114.8	96.8	99.5

Source: A.M. Best Company - By Permission

Over the long term, this ratio should be under 100 percent. Two years may not be sufficient to determine the long-term profitability of either an individual reinsurer or the reinsurance segment. Additionally, the impact of a natural, man-made or tort catastrophe could distort the results for the reinsurance industry. In the case of a particular reinsurer, volatile operating ratios greater than 100 percent should be cause for increased scrutiny.

This ratio is comprised of two components, investment income and underwriting results. Due to the magnitude of the investment income component, particularly for reinsurers, the underwriting component may be overshadowed. Operating ratios may be improving while combined ratios deteriorate. Therefore, the two components should be analyzed separately.

It should be noted that this ratio does not include the effect of the federal income tax. Since enactment of the Tax Reform Act of 1986, federal income tax has become a material item affecting bottom line profitability and financial condition.

RATIO 5

INVESTMENT YIELD

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	8.4	7.8	7.7	7.6	7.8

MEAN

	1985	1986	1987	1988	1989
RATIO	8.8	7.2	7.5	7.7	8.1

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	5.8	3.1	5.3	5.9	6.2
25TH PCTL	7.6	6.0	6.1	6.5	7.1
50TH PCTL	8.8	7.5	7.4	7.4	8.0
75TH PCTL	9.9	8.7	8.2	8.4	8.7
90TH PCTL	11.6	9.6	9.6	10.2	9.5

Source: A.M. Best Company-By Permission

If the investment yield of a reinsurer is unusually high in comparison with the reinsurance segment, the nature and quality of its investments should be questioned. Since a reinsurer is already bearing a significant level of underwriting risk it would generally not be appropriate also to become involved in speculative investments. However, a reinsurer engaged in long-tail lines of business could acquire investments of a somewhat longer than average term and still match liabilities as they become due for payment. Longer-term investments often have a higher yield. The new Schedule D summary in the 1990 annual statement reflects the NAIC's heightened concern with asset quality.

Capital gains and losses are not included in the calculation of this ratio, though these items may be a material part of the investment strategy of some companies. The tax strategy employed by a company may also affect the investment yield.

RATIO 6

CHANGE IN SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	30.4	57.2	13.0	14.0	12.7

MEAN

	1985	1986	1987	1988	1989
RATIO	29.5	53.0	21.9	16.0	15.0

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	-13.9	0.3	-2.0	-2.2	-6.7
25TH PCTL	-0.5	12.2	5.1	5.2	1.7
50TH PCTL	14.7	28.2	10.2	12.5	8.5
75TH PCTL	54.6	68.9	19.5	20.0	15.7
90TH PCTL	93.0	109.1	46.7	46.5	52.2

Source: A.M. Best Company-By Permission

The change in surplus of a reinsurer can result from operations or external factors such as capital contributions or dividends. Surplus changes are detailed on page 4 of the annual statement. The external source of most additional surplus the reinsurance segment received in the mid-1980s came as contributions from parents or as proceeds from the sale of stock.

Possible use of surplus relief reinsurance to increase surplus can be checked by reviewing the result of Ratio 3 (Surplus Aid to Surplus).

RATIO 7

LIABILITIES TO LIQUID ASSETS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	92.9	87.0	86.6	85.0	83.6

MEAN

	1985	1986	1987	1988	1989
RATIO	76.0	73.5	75.4	70.0	70.5

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	38.0	13.8	31.2	35.1	40.3
25TH PCTL	53.4	51.7	60.4	55.0	56.1
50TH PCTL	77.5	76.8	77.3	74.9	73.7
75TH PCTL	94.9	88.1	89.8	83.7	85.4
90TH PCTL	107.4	103.4	99.9	92.3	95.7

Source: A.M. Best Company - By Permission

There is a general perception that reinsurers are less likely to require liquid assets for immediate payment than primary carriers due to their long-tail liabilities. However, reinsurers need to be highly liquid in order to cover catastrophe losses and large loss payments.

Relative to the total industry, a greater portion of reinsurance loss reserves will be reserves for incurred but not reported (IBNR) losses due to the slow development of reinsurance losses and their long-term payout pattern. As a result, reinsurers may have somewhat higher values for Ratio 7 than the entire insurance industry has.

The technical comments to "Insurance Regulatory Information System Ratio Results 1989" ("IRIS Ratio Results 1989") for Ratio 7 note that "Companies maintaining large deposits with companies that they reinsure tend to have higher ratio results." This occurs because funds held by or deposited with ceding companies are not considered in the formula as liquid assets. However, contractual arrangements involving funds held by ceding companies generally are permitted under current law to give reinsurers the right of offset against outstanding losses and other liabilities. Furthermore, since the amounts due a ceding company are considered as liabilities, it would arguably be consistent to include the corresponding assets. Funds held are often part of the economic reason for entering into reinsurance arrangements and often are a material balance sheet item for reinsurers.

RATIO 8

AGENTS' BALANCES TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	23.2	18.2	17.4	12.9	12.1

MEAN

	1985	1986	1987	1988	1989
RATIO	22.4	15.7	15.1	10.8	11.9

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	0.0	0.0	0.0	0.0	0.0
25TH PCTL	1.7	0.7	3.2	0.3	1.0
50TH PCTL	16.0	10.6	7.9	8.7	6.3
75TH PCTL	33.0	23.2	20.1	16.8	15.7
90TH PCTL	53.3	39.1	35.7	24.8	29.5

Source: A.M. Best Company - By Permission

In reviewing the ratio of a reinsurer, the reason for a value markedly higher than the reinsurance segment should be determined. However, as indicated in the technical comments to "IRIS Ratio Results 1989," reinsurers' results for this ratio may exceed the results of primary companies. The agents' balances account, in the case of reinsurers, is made up principally of amounts due from reinsured companies. The quality of this asset is generally higher than agents' balances for a primary carrier.

While agents' balances may become a problem in the case of a primary insurer and not be available in the event of liquidation, under current law a reinsurer's balance due from ceding companies may be set off against losses as they arise. In fact, reinsurance contracts often provide for netting of losses and premiums due from the same company.

In addition, the extended time for payment of reinsurance premiums may make reinsurance balances larger than those of primary companies. Furthermore, when transactions involve alien insurers, premium due dates may be further extended.

RATIOS 9 AND 10

ONE-YEAR RESERVE DEVELOPMENT TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	23.5	24.4	14.3	7.6	1.6

MEAN

	1985	1986	1987	1988	1989
RATIO	24.8	20.1	17.1	9.5	6.2

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	-1.4	-0.5	-1.2	-3.8	-14.0
25TH PCTL	0.3	0.0	0.0	-0.4	-4.7
50TH PCTL	7.9	11.3	5.4	3.6	0.4
75TH PCTL	26.4	34.8	16.1	9.9	6.8
90TH PCTL	79.1	55.7	36.7	20.4	15.0

Source: A.M. Best Company - By Permission

TWO-YEAR RESERVE DEVELOPMENT TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	28.3	48.0	54.5	27.6	11.9

MEAN

	1985	1986	1987	1988	1989
RATIO	29.5	46.1	48.5	28.9	12.2

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	-0.0	-4.3	-1.6	-5.3	-14.1
25TH PCTL	2.7	2.7	5.2	0.4	-1.2
50TH PCTL	15.3	27.6	28.4	14.2	4.9
75TH PCTL	45.1	64.0	72.9	32.1	18.2
90TH PCTL	85.5	138.2	119.2	54.0	35.1

Source: A.M. Best Company - By Permission

History indicates that reinsurers' values on these ratios may be higher than those of the total industry even in a period of relative stability. Some of the reasons for this are the severity and unpredictability of reinsurance losses, time lags in loss reporting, and the leveraging effect of social and economic inflation.

When analyzing a reinsurer, attention should be given to the relationship of paid to incurred losses. The difference represents the change in reserves. For example, if paid loss ratios are increasing while incurred loss ratios remain constant, smaller reserve increases are being made despite increasing levels of payment.

Given the same distribution by line of business, the higher the ratio of paid losses to incurred losses for an accident year, at the same maturity level, the more unfavorable should be the interpretation of the tests' stated reserve adequacy. Conversely, the lower the ratio of paid losses to incurred losses for any accident year at the same "age", all things being equal, the more favorable should be the interpretation of the tests' stated reserve adequacy. The data to perform this analysis can be found in Schedule P. As a caveat, any special transactions or mix of business changes distorting this analysis must be considered. Furthermore, the Schedule P Summary and line 30B are likely to contain non-homogeneous data as well as changes in mix of business by year.

Ratios 9 and 10 determine how loss and loss adjustment expense reserves for prior years have developed. They do not reflect additional premiums generated by loss development, but merely relate to a determination of the adequacy or inadequacy of the reserve liabilities. Many reinsurance companies write substantial amounts of retro-rated business. For this business, as losses are reported or reported losses are developed, additional premiums may be earned, reducing the impact of the adverse development. Annual statement loss development schedules may not match these additional premiums to the accident years for which they are collected. Some reinsurers also have sliding scale commission adjustments that can further reduce the impact of any adverse development.

In the analysis of a reinsurer, the comparison with values for the reinsurance segment should be considered. The absence of an unusual value does not indicate that a problem does not exist.

RATIO 11

ESTIMATED CURRENT RESERVE DEFICIENCY TO SURPLUS

WEIGHTED AVERAGE

	1985	1986	1987	1988	1989
RATIO	49.4	74.2	25.7	-36.1	-32.9

MEAN

	1985	1986	1987	1988	1989
RATIO	28.5	36.3	13.5	-14.9	-22.3

PERCENTILE

	1985	1986	1987	1988	1989
10TH PCTL	-25.2	-7.7	-29.5	-63.5	-63.7
25TH PCTL	-3.2	0.0	-15.4	-47.2	-42.6
50TH PCTL	8.4	14.6	0.0	-18.1	-21.2
75TH PCTL	54.1	60.4	22.7	0.0	-1.5
90TH PCTL	131.4	124.3	78.4	7.9	12.7

Source: A.M. Best Company - By Permission

This ratio, as opposed to the other ratios which report historical data, attempts to estimate current reserve deficiencies or redundancies. It should be used with great care since the values obtained are not a meaningful indication of current reserve levels. The ratio presupposes that both past loss development (Ratios 9 and 10) and prior premium levels are indicative of the future. Typically, this ratio indicates reserves are adequate in a period when premuims are increasing and redundant when premiums are declining. Also, significant changes in mix of business may distort this ratio. The shortcomings of this ratio can be seen in the wide swing in results between 1987 and 1988.

RELATED ARTICLES

Individuals interested in the financial analysis of reinsurers also may find the following articles to be useful:

1. Bailey, Robert A., "Analyzing and Ranking Reinsurers," *Journal of Insurance Regulation*, June, 1988, p. 435.

2. Ludwig, Stephen J., and McAuley, Robert F., "A Non-Parametric Approach to Evaluating Reinsurers' Financial Strength," Casualty Actuarial Society Discussion Paper Program, 1987, p. 229.

STATISTICAL APPENDIX

The IRIS ratio computations were produced to indicate the results of the professional reinsurance industry for comparison with the total insurance industry.

In the previous edition the data base contained 139 companies considered reinsurers by A.M. Best Company. The data base for this edition contains 112 reinsurers after eliminating a number of companies which are either in runoff or inactive as identified by a Best classification of NA-4 Rating Procedure Inapplicable or a premium to policyholders surplus of less than 0.1.

"Weighted" results were produced by aggregating the data for all companies and computing each ratio.

"Mean" results were produced by aggregating the individual results of all companies and dividing by the number of companies.

"Percentile" results represent an evaluation of each test result at the 10, 25, 50, 75, and 90th percentiles.

EXHIBIT II

1989 MEAN AND MEDIAN RATIO RESULTS

Ratios	Mean		Median	
	2377 Companies	112 Reinsurers	2377 Companies	112 Reinsurers
1. Premium to Surplus	117.6	92.4	96.0	76.5
2. Change in Writings	16.4	12.2	2.0	1.1
3. Surplus Aid to Surplus	4.1	0.6	0.0	0.0
4. Two-Year Operating Ratio	74.4	86.7	86.0	86.9
5. Investment Yield	7.7	8.1	7.7	8.0
6. Change in Surplus	14.0	15.0	9.0	8.5
7. Liabilities to Liquid Assets	69.0	70.5	72.0	73.7
8. Agents' Balances to Surplus	16.7	11.9	6.0	6.3
9. One-Year Reserve Development	4.5	6.2	0.0	0.4
10. Two-Year Reserve Development	10.7	12.2	0.0	4.9
11. Estimated Current Reserve Deficiency	-2.6	-22.3	1.0	-21.2

Source: Data on 2377 Companies — NAIC Insurance Regulatory Information Systems Ratio Results 1989 - By Permission

Data on 112 Professional Reinsurers — A.M. Best Company - By Permission