RESTATEMENT OF THE CONSIDERATION OF INVESTMENT INCOME IN WORKERS' COMPENSATION INSURANCE RATEMAKING

By Frank Harwayne

I. Introduction:

The purpose of this restatement of the treatment of investment income on reserves in workers' compensation insurance ratemaking is to appraise the expected total return on the workers' compensation insurance transaction, inclusive of investment income, and to describe the consideration given to investment income in the ratemaking process.

With rising claim costs and, therefore, rising rates marking its recent history, workers' compensation insurance has been the object of close examination in the search for relief from rising insurance costs.

The expense provision in workers' compensation insurance includes a percentage allowance to the underwriters for profit. Since profit would result only to the extent that unforeseen contingencies do not arise, this percentage is called a "profit and contingency" allowance.

The workers' compensation pricing program is legally bound to provide for the full and immediate funding of employee benefits even though claims may be paid over substantial periods of time. This means that after receipt of premium and prior to final disposition of incurred liabilities, insurance carriers have an interest earning opportunity to the extent such liabilities do not exceed levels contemplated by premiums received. For example, to the extent premium is paid in advance and incurred expenses are not immediately paid, there is a comparable interest earning opportunity related to the unearned premium reserve.

The underwriting profit and contingency allowance together with the interest earning opportunity constitute the carriers' expected return on the premiums that policyholders are asked to pay.[1] For purposes of this restatement, real estate

(1) The insurers' total return, as stated in Section IV-A would, of course, include investment income on their own net worth.

earnings and other "other income" items are included in the term "investment income". Also, the analysis applies to aggregate results and expectations, not those for individual policies.

The restatement consists of five sections in addition to this Introduction. Section II presents the principles for measuring investment income in a ratemaking context. Section III analyzes the theoretical functions and interaction of investment income and the profit and contingency allowance in light of actual data. Section IV provides further background on investment income both as to insurance and other industries. Section V applies the results of the preceding sections to ratemaking. Section VI summarizes the conclusions of the other sections. Finally, there are appendices consisting of various statistical exhibits referenced in the restatement.

II. Principles of Investment Income Measurement:

The fundamental concern in ratemaking is that rates be neither excessive, inadequate, nor unfairly discriminatory. These standards must be applied on a prospective basis in reviewing rate filings and, therefore, where investment income is considered, the present value of the investment income that insurers can anticipate from expected loss reserves and unearned premium reserves is the relevant consideration. Accordingly, the National Council on Compensation Insurance approaches the estimation of expected investment income as a three-part process - (1) determination of an appropriate investment yield, (2) application of this investment yield to unearned premium reserves in order to estimate investment income attributable to unearned premium reserves, and (3) application of the investment yield to the expected loss reserves in order to estimate investment income attributable to loss reserves.

II-A. Measuring the Investment Yield: Five-year average investment yields have been used to estimate the amount of investment income produced. Such a base is a reasonable reflection of the need for stability in considering that payment amounts are subject to substantial fluctuation and extend over long and fluctuating durations (claims on the average are consistently underestimated as to amount by insurance companies and are payable over longer durations than estimated). The policy contract affords the insurer only one year of premium to cover lifetime obligations; the income and return of principal from the investment part of the premium can change radically depending on events beyond the insurer's control and there is little or no chance to correct a bad estimate of the yield, or to correct an investment that goes sour either as to maturity, rate or principal amount. Thus, the use of a five-year[2] average investment return provides some stability which reflects the long, varying, and not entirely predictable duration of claims and reduces the effects of unpredictable fluctuations in interest rates.

Computation of the applicable five year investment rates is based upon stock company totals reported in Best's Aggregates and Averages for Property-Casualty Insurers for the years 1972-1976. The investment income less investment expense is compared with assets available for investment and a rate determined. This is shown in Appendix A. The rate therein determined is applied to unearned premium reserve data and loss reserves as described in sections II-B and II-C.

II-B. Investment Income on Unearned Premium Reserves: Investment income on unearned premium reserves for the latest two calendar years is estimated using data obtained from Best's Aggregate and Averages. These estimates reflect the average unearned premium reserves subject to investment (adjustments being made for such

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(2) Some studies recognize the difficulty inherent in predicting the exact timing of claim payments and/or the level of interest rates by using averages of up to ten years or more (including or excluding unrealized capital gains) and variations thereof for some aspects of investment income. See, for example, "Statement of Dr. Irving H. Plotkin, Sr. Economist, Director of Regulation and Economics, A.D. Little, Inc., on Investment Income and Ratemaking for Property Insurance before the Texas State Board of Insurance, Austin, Texas, Feb. 16, 1977." Worksheet 1.

items as delayed remission of premiums), the five-year average investment rate and Federal Income Tax.

Appendix B provides the calculations of investment income as a percentage of standard earned premium for calendar years 1975 and 1976. These values are respectively .68% and .69% before Federal Income Tax and .59% for both years after Federal Tax.

II-C. Investment Income on Loss Reserves: Investment income on loss reserves is calculated based on the average investment rate and the average duration during which the carrier has an interest earning opportunity. For workers' compensation insurance, claims information is compiled under the Unit Statistical Plan according to the following categories:

Death
Permanent Total
Major Permanent Partial
Minor Permanent Partial
Temporary Total
Non-compensable and Contract Medical

The latest available two policy years of data were used to determine the relative dollars incurred in each category, how much was paid as a lump sum, how much was paid periodically and how long such payments are paid on the average for each type of case. The five year average investment yield as shown in Appendix A was used to calculate the amount of investment income generated by the reserves prior to payment. This investment income is expressed as a percent of the standard earned premium required by the claim amounts.

The details of these calculations, which result in an estimate of 3.94% of standard earned premium[3] for the latest available two policy years before Federal Taxes and 3.37% after Federal Taxes, are shown in Appendix C.

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(3) or approximately 4.38% of net earned premium based upon a 10% average premium discount.

II-D. Comparison to Values Reported in the Insurance Expense Exhibit: It should be noted that, for the past decade, actual aggregates and averages of losses and expenses have usually exceeded the premium provisions for expected losses and expenses and have absorbed some or all of the contingency elements of premium and investment income. The real world has required that funds provided through investment income be available as a means for mitigating the actual riskiness of insurance operations. For example, reported investment income for the year 1976 is extraordinarily large as is the level of adverse loss experience. The loss reserves in excess of the expected losses (less payments) are actually being reserved out of policyholders' surplus; nevertheless, NAIC instructions recommend that investment income be distributed to line of insurance in proportion to reserves.[4] Thus, not only are insurers required to reduce their surplus in order to fund claims in excess of expected, but the investment income being earned is being attributed to policyholder supplied funds despite the fact that the investment income was generated by the insurer's surplus which had to be transferred to loss reserves because of inadequate premiums paid by policyholders. This is something that must be adjusted for in comparing investment income as quantified in this restatement with that reported in the Insurance Expense Exhibits of the companies. There are other such adjustments (e.g. five year average rate of return; standard and net premiums; present value; Federal Income Tax).

Because of differences between policy years, calendar years, development of claims, NAIC requirements and recommendations in reporting calendar year

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(4) It should be noted that for calendar years prior to 1975, the instructions to the Insurance Expense Exhibit require that"... a full description of the method used to allocate investment income by line of business...(be) submitted to the supervisory official of...(the) jurisdiction." For calendar year 1975 and 1976 these instructions require allocation of investment income by line based upon total reserves (unearned premium and loss reserves) while providing that modifications to this procedure are allowed subject to explanation.

investment income, etc., comparisons of investment income using Unit Statistical Plan data with those in the Insurance Expense Exhibit will show some differences.

NAIC rules for allocating investment income to line of insurance are predicated on the apparently logical notion that such income should be distributed in proportion to reserves. While this may be satisfactory when rate levels are adequate, to the extent that the source of reserves has been net worth (i.e. premiums have been inadequate to cover losses and expenses), it would be erroneous to attribute the investment income to policyholder supplied funds. The extent of "overestimating" such investment income for these companies during these years may be crudely approximated by comparing expected losses (approximated at 60% of standard earned premium) with actual losses and applying the resulting ratio to reported investment income. The adjustment ratios are shown below:

CALCULATION OF RATIOS TO ADJUST REPORTED INVESTMENT INCOME
(000 Omitted)

(1) Year	(2) Standard Earned Premium	(3) 60% of Standard Earned Premium	(4) Total Incurred Losses	(5) Ratio (3)÷(4)
1972	2,110,914	1,266,548	1,398,716	.91
1973	2,498,112	1,498,867	1,632,695	.92
1974	2,893,812	1,736,287	1,956,503	.89
1975	3,121,432	1,872,859	2,171,644	.86
1976	3,587,603	2,152,562	2,655,369	.81
1972-76	14,211,873	8,527,123	9,814,927	.87

Investment income reported by these insurers for this line of business during these years and the correction to adjust for overreporting is as follows (000 omitted):

ESTIMATED INVESTMENT INCOME FROM PREMIUMS

(1) Year	(2) Reported Investment Income	(3) Ratio to Adjust Reported Amount	(4) Estimated Investment Income From Premiums (2)x(3)
1972	95,569	.91	86,968
1973	117,709	.92	108,292
1974	155,123	.89	138,059
1975	215,494	.86	185,325
1976	255,748	.81	207,156
1972-1976	839,643	xx	725,800

Since the investment income was earned throughout the year, conservatively we may assume that this provided an interest earning period of approximately .5 years which at 5.25% interest would bring the present value of the 725,800 to 707,467 which is 4.98% of standard earned premium of $14,211,873,[5] before Federal Income Tax or 4.26% (4.98% x .856) after Federal Income Tax.

II-E. Rates of Taxation and Return After Tax: As stated earlier, the income from investment of unearned premium reserves and loss reserves should be combined with the anticipated underwriting return to determine the reasonableness of the overall return from both operations. Appendices B and C show our estimate of the amount of investment income based on the reserves during the most recent available periods. Note that the total yield from both reserves for the latest available periods (Before Federal Income Taxes) is 4.63% (3.94% + .69%). This, combined with the anticipated 2.5% return from underwriting, produces an anticipated total return from both underwriting and investments of policyholder supplied funds (before Federal Income Taxes) of 7.13% (4.63% + 2.5%), or an estimated total net return (after Federal Income Taxes) of 5.26% (3.96% + 1.3%).

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(5) or 5.36% of net earned premium of $13,192,112.

III. Theory and Interaction of Investment Income and the Profit and Contingency Factor:

III-A. Background: Income from a profit and contingency factor, together with the use of premium prior to payout for expenses and losses has been the basis of the workers' compensation insurance industry's pricing structure for a great many years.

The current provision for underwriting profit and contingency in the workers' compensation rate is 2.5% of premiums. This has been the allowance for many years during which time interest income from unearned premium and loss reserves has varied with the cost of money.(6) It has generally been considered a minimal allowance even in periods when workers' compensation underwriting results were more predictable than today's conditions permit.

The necessity for an underwriting profit and contingency allowance rests on sound grounds. First, since rates are set at levels calculated to meet expected claim costs and expenses and no more, it is an essential element of the rate structure to provide part of the wherewithal to assume the risks of the business.

Second, to place the profit and contingency mechanism entirely out of the price structure, either by formal removal or, backhandedly, by unqualified subtraction of investment income, moves in the direction of undermining basic goals and virtues of the workers' compensation insurance system, namely:

(a) The incentive to provide insurance is impaired; sooner or later this must mean the drying up of the market.

(b) The desideratum of maintaining a prudent and conservative instrumentality for dispersing and accommodating the risks of

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(6) The cost of money, commonly associated with rates of interest, is one of the determining factors reflected in the expected profitability of an enterprise. An increase in the cost of money almost invariably will be reflected in an increase in the appropriate profit expectation of most businesses, as a potential reward for risk bearing. Traditionally, exclusion of investment income from explicit consideration in ratemaking has served to recognize this flywheel effect, thereby reducing the need for changing the underwriting profit and contingency factor.

the employer, and no less importantly for assuring benefits to his employees, is eroded in favor of additional reliance on the speculations and vagaries of the investment market.

The degree to which the goals and virtues of the system are diminished will, of course, depend on the actual methodology applied, but deterioration cannot be avoided.

Third, as it will be demonstrated later, today's emerging conditions make it difficult to keep rates for the business overall at an adequate level, although it is hoped that up-to-date ratemaking methods will keep them respectably close to target. The risk of loss to individual insurers is, of course, much greater than that for the industry as a whole.

Despite its obvious necessity, the profit and contingency factor in ratemaking has sometimes been misconceived to be solely a profit factor. On occasion, this has been further compounded by a presumption that large amounts of investment income derived from policyholder supplied funds are piled on top of otherwise adequate profit margins.

Contingency and profit are complementary to each other in the following sense. There is a contingency that the sum of actual losses and expenses will not be exactly equal to the amounts provided for that sum in the premium. The premium structure contains an element for such a contingency. If in fact there turns out to be no difference between the actual and theoretical costs, then the contingency has not arisen and the difference between actual costs and the premium becomes a profit, albeit modest. If actual costs are less than the amounts provided, then the profit is increased. If the reverse is true, the profit will be decreased and may become a loss. In all situations the elements are usually expressed in percentage terms with the premium being described as 100%.

The modest profit and contingency provision contained in workers' compensation rates reflects the parallel fact that use of premium before pay out is counted upon by the insurer. But the focus of this restatement will be on the entire profit and contingency story as it is reflected in the historical record of actual results (which shows, in fact, underwriting losses) as well as the dispersions of results by company. It will demonstrate the riskiness of the insurance business and develop a basis for quantifying the contingency element. In this way, it will treat investment income as it interacts with the profit and contingency factor in the rates.

But first, it is worthwhile to review, very briefly, the intrinsic significance and value of the subject of the business venture, viz. insurance.

III-B. Insurance as a Source of Funds for Security and Growth: Insurance is a source of funds for financing business. By assuming the risks of others it permits individuals to go about their business of manufacturing, processing, distributing, etc., secure in the knowledge that the effects of any untoward event will be mitigated by insurance coverage. With specific reference to workers' compensation costs, insurance enables the employer to level out that part of his labor cost relating to the potentially high expenditures resulting from lifetime indemnity payments and unlimited medical benefits payable to his injured employees.

Were it not for insurance, the average employer would have to divert substantial amounts from direct use in his business. He would need to maintain such amounts in liquid form in order to be able to pay one or more workers' compensation claims which, with today's benefits, could amount to hundreds of thousands of dollars. Thus insurance contributes significantly to security, growth, and assurance that the Gross National Product will continue to grow.

Survival of the insurance industry as a whole is vital for the well-being of individual businesses. Insurers must be able to endure adversity and still

continue to accept the risks transferred to them by employers; otherwise employers would need to seriously curtail their own activities in order to comply with the workers' compensation laws.

III-C. Fluctuation, Averages and the Public Interest: The fluctuation of insurance company results is evidence of a real risk and cannot be ignored. It must be viewed together with the consideration that insurance is charged with the public interest. It is tragic when insurers become insolvent; the immediate effect of such insolvency falls on claimants who have a right to the benefits as specified by law. Also, when due regard is not given to solvency considerations, it becomes necessary for insurers to restrict their writings[7] and, consequently, policyholders have difficulty finding insurers to whom they can transfer their risks.

It is not enough to dismiss this problem on the bland assumption that a security fund will handle the matter, certainly not when we are talking in terms of as much as 30% or more of the business.[8] On the other hand, this does not mean that rates should be so high that more than 97% of the business can operate so profitably that its growth would be guaranteed. It does mean that a balance must be struck such that the individual insurer which operates at higher than average cost is permitted to function and pay its obligations to claimants and to policyholders, but not to grow without improving its efficiency. Such a balance provides the framework and the boundary line between regulation in the public interest and competition in the public interest. Additionally, it is desirable that insurers who are operating at modestly higher than average cost be able to continue in business and to provide insurance to policyholders in the interest of maintaining and improving the economy, thereby increasing the Gross National Product. The present

(7) Thus maintaining a prudent amount of surplus to back up any adverse fluctuation in reserve liabilities or decrease in asset values.

(8) See page 14.

modest allowance of 2.5% for underwriting profit and contingencies plus actual investment income affords this reasonable balance. Other ways of looking at this problem are set forth below.

III-D. Contingency as a Ratemaking Element: The calendar year 1972-1976 standard premium loss ratio experience can be used to determine reasonable contingency parameters which will permit companies somewhat more costly than the average to operate at a reasonable level. The relationship between the average loss ratio, $\bar{r}$, and the standard deviation of the loss ratio, s_r, for stock companies for the years 1972-1976 follows:

Calendar Year	Loss Ratio $\bar{r}$	Std. Dev. s_r	$s_r + \bar{r}$
1976 (All)	.7522	.1072	.143
1975 (Non-Par.)	.6977	.0816	.117
1974 (Non-Par.)	.6761	.0750	.111
1973 (Non-Par.)	.6538	.0621	.095
1972 (Non-Par.)	.6606	.0630	.095
Average	xxx	xxx	.112

From the foregoing we see that the standard deviation from the expected loss ratio for the five years was approximately 11.2% of the average loss ratio; for 1976 it was 14.3%. Analysis of 1976 experience for all stock companies shows the standard deviation of the loss ratio to be 10.7% of the standard premium. Also, analysis of the 1976 experience for both stock and mutual companies shows the standard deviation of the loss ratio to be 10.7% of the standard premium. The 1976 distribution of loss ratios at or above given ratios to the average loss ratio is as follows (a complete table appears in Appendix G):

(1) Loss Ratio As Ratio to Average	(2) % of Business Higher Than (1)
1.00	42.3%
1.05	30.2
1.10	22.7
1.15	19.0
1.20	8.5
1.25	5.8

It will be seen that 22.7% of the business have loss ratios worse than 1.10 times the average. Ten percent (1.10-1.00) above the average is taken at .69 standard deviations (.10x.7360+.1071=.69) above the mean loss ratio (see end of appendix G).

It does not serve public policy to perfect a system wherein investment income is completely removed as a source of income leaving a significant percentage of the business to operate at a net income loss, i.e. those insurers with loss ratios as little as 4.2% above the average (current profit and contingency factor of 2.5% divided by an approximate standard permissible loss ratio of 60.0%). Interpolation at 1.042 yields 32% of the business which would more than exceed the 2.5% contained in the rates for profit and contingency, assuming the average loss ratio were in fact the expected loss ratio.

The foregoing discussion can be translated into a manual rate structure[9] which would be as follows:

Production) General) Taxes)	28.2%[10]
Losses) Loss Adj.) Profit and Contingency)	71.8% = 100% - 28.2%
Manual Premium	100.0%

Now, let us suppose that the selected profit and contingency allowance reflects the 1976 stock companies' standard deviation in the prior table. Taking the figure at .14 of loss and loss adjustment (71.8%), then losses plus loss adjustment are 63.0% and profit and contingency is 8.8% and, taking loss adjustment to be 11.5% of losses, losses comprise 56.5% and loss adjustment 6.5% of manual premium. The final premium structure would be as follows:

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(9) On a net premium basis, this structure would contemplate 19.0% for production, general expenses and taxes and 81.0% for losses, loss adjustment and profit and contingency (this breakdown of the net premium dollar is derived from a typical distribution of policies by premium size).

(10) For illustrative purposes the 28.2% value assumes 17.5% for production, 8.0% for expenses and 2.7% for taxes.

Production) General) Taxes)	28.2%
Losses)	56.5
Loss Adj.)	6.5
Profit and Contingency)	8.8
Manual Premium	100.0%

It is possible to show the correspondence between the selected percentage of the business whose experience will fall outside of the profit and contingency loading, the amount of such loading, and the corresponding permissible loss ratio. Entering Appendix G, we can show the necessary distribution of the standard premium dollar which will provide profit and contingency margins for selected percentages of the business that can be expected to operate unprofitably. In doing so, it is assumed that actual average loss ratios would equal expected. A table follows:

Table of Profit and Contingency Relationships and Permissible Loss Ratios Based on Selected Percentages of Business Operating Unprofitably

								Explanation
(1) Selected Percentage Operating Unprofitably	5.8%	8.5%	19.0%	22.7%	30.2%	33.6%	42.3%	Selected from Appendix G
(2) Loss Ratio Corresponding to (1) Expressed as Ratio to Average	1.25	1.20	1.15	1.10	1.05	1.036	1.00	
(3) Premium Less Expenses	71.8	71.8	71.8	71.8	71.8	71.8	71.8	
(4) Loss & Loss Adj.	57.4	59.8	62.4	65.3	68.4	69.3	71.8	(3)+(2)
(5) Loss	51.5	53.6	56.0	58.6	61.3	62.2	64.4	(4)+1.115
(6) Loss Adj.	5.9	6.2	6.4	6.7	7.1	7.1	7.4	(4)-(5)
(7) Profit and Contingency	14.4	12.0	9.4	6.5	3.4	2.5	0.0	(3)-(4)

Even if averages worked out as expected, the above demonstrates that over 33% of the business will operate unprofitably with the current profit and contingency provision of 2.5%. Fortunately, these 33% have available investment income approximately equal to 6.7% of standard premium (the 1976 result).[11] Even so, there still remain somewhere between 19.0% and 22.7% of the business that will operate at a net

[11] See page 22.

income loss. Following the relationships in the above table indicates that this percentage is 20.3%.

Stated in terms as observed in the real world, it is apparent that the largest element of variance in insurers' results is to be found in the loss ratio. With an underwriting profit and contingency loading of 2.5%, the standard premium permissible loss ratio is approximately at 62.2%; as stated in Section III-E, the 1972-1976 average operating ratio in excess of 97.5% of net premium was 10.86% for stock companies and 8.84% for mutual companies. Adjusted for the 1976 relationship between net and standard premium, these figures become 10.1% and 8.4% respectively and average to 9.7%.(12) Thus, it will be seen that the present system as a whole has resulted in missing the target by approximately 9.7% of standard premium, that the 9.7% is not entirely absorbed by the 2.5% + 5.6% (1972-1976 average stock company investment income) available in the total workers' compensation insurance system, and that the temporal risk (observation of 9.7% larger cost than the expected average) combined with the spatial risk (observation that 42.3% of the business will incur costs higher than the achieved average) point up that workers' compensation insurance is indeed a "risky" business. The present provision for profit and contingency plus investment income is modest and required for both the temporal and the spatial risk. That it is required to do "double duty" for both risks demonstrates the bare necessity afforded by the present program.

III-E. Investment Income as an Offset to Contingencies and Fluctuations: The role of investment income has been largely misunderstood in insurance ratemaking. It is wrong to assume that the insurance industry consists of a single monolithic insurer and that ratemaking never misses its target. Further, it cannot be assumed

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(12) 9.7% = (10.1% x 5,317,986,963 Stock Standard Premium + 8.4% x 1,797,649,021 Mutual Standard Premium) ÷ 7,115,635,984 Total Standard Premium.

that if ratemakers have missed their target in the past, nevertheless no such difference between theory and practice will occur in the future.

In the real world, the insurance industry is not monolithic. Net operating ratios, i.e. the sum of incurred losses and incurred expenses related to net earned premium, vary greatly and are substantially beyond the control of individual insurers. It is proper that insurers be compensated for the risks involved in undertaking to provide insurance, the results of which will show wide fluctuation.(13)

In addition, it has not been possible on a practical level to achieve the target of 2.5% of premium for underwriting profit and contingency largely because there is an increasing non-diversifiable (systematic) element of risk in writing workers' compensation insurance. For example, in societal terms, the past experience cannot be precisely adjusted to reflect the ever growing awareness on the part of employees and society in general of the complex interrelationships between work, injury, disease, disability and financial well-being (this has sometimes been called "social inflation"). While science has progressed toward making work environments safer, it has also produced, implied or inferred statistical relationships between work and disability which are being urged upon workers' compensation administrators at ever increasing rates. Thus, damage to various parts of the body or the psyche are inferred to be the resultant of cumulative injuries to the organism arising from the work environment rather than to be the result of the normal life process. Seldom is this inference clearly delineated as either one or the other - rather it is that the data simply reflect a gradually increasing success on the part of individuals in legally connecting the disability with the work environment. Those persons who find themselves with a disability are apt to be attracted to the premise that it is work induced because, aside from the psychological benefit of

(13) "(Re:) The risk inherent in the line of insurance itself (.) some lines will have greater unpredictability and fluctuation of losses than others and an investor in a company which wrote such lines would demand a greater expected return than he would in a company in which the return was more certain." - Attorney General vs. Commissioner of Insurance (and four companion cases) Mass. Adv.Sh.(1976)2068

attributing the disability to an external force beyond the individual's control, there is the very real economic benefit of providing a continuing income to the individual and his dependents. Additionally, the uncertain effect of changes in economic conditions, retiree benefits and other such elements in today's socio-economic order make the insurance operation a volatile one.

The inherent upward bias, generated by the increasing level of this awareness, is not fully compensated for, even with the use of trend factors. This bias significantly augments the need for an adequate profit and contingency element in ratemaking. Such biases have always been an implied part of both the underwriting profit and contingency and the investment elements; if the latter becomes a specific consideration to be credited toward reduced rates then the counterpart contingency which cannot be diversified must also become much more of a specific consideration to be incorporated in rates as well.

Failure to realize average expectations is documented in Appendices D and E attached. Despite the use of a relatively sophisticated ratemaking system wherein the insurance industry has endeavored to realize 2.5% for underwriting profit, or an operating ratio of 97.5% of premium, the results have fallen short in the years 1972-1976.

Since workers' compensation insurance is a kind of insurance subject to audit at policy expiration with long reserve and claim payment durations, the expenses recorded in part will relate to premiums of older policy years. Accordingly, an argument could be made that actual expenses may in fact emerge in larger amounts when the more current policies have run their course. Nevertheless, no adjustments for this have been reflected in the operating ratios. Based on the attached Appendices D and E, actual operating ratios (losses, expenses and policy-

holder dividends related to net earned premiums)[14] exceeded 97.5% of net premium by the following amounts:

Operating Ratio In Excess Of 97.5% Of Net Premium

Calendar Year	Stock	Mutual
1976	14.83%	7.20%
1975	11.46	7.80
1974	11.88	10.25
1973	7.39	8.55
1972	8.76	10.42
Average	10.86%	8.84%

Such figures are undoubtedly explained in large part by non-diversifiable or systematic risk associated with increasing social awareness. Conservatively, these five year shortages of 10.86% for stock companies and 8.84% for mutual companies will be seen to exceed the 2.5% provision for profit and contingencies and wipe out the investment income. Although this is not recommended, it could therefore not be unreasonable to incorporate a profit and contingency provision of as much as 12.5% in order to hope to achieve an underwriting profit of 2.5%.

That fluctuation and variation from expectation is a reality for the workers' compensation insurance industry is readily evident from the operating results of stock and mutual insurance companies in each of the five years 1972-1976 as shown in Appendices D and E. Whether one considers the results on a net premium or standard premium basis, it is obvious that the target underwriting result of 2.5% was not realized by the industry as a whole in any of the five years and also not by very many individual insurers. The stock company bottom line results presented in Appendix D bring out the role of investment income in leveling out fluctuation of insurance company results without penalizing policyholders for the consequences of possible poor investment policies of insurance company managers.

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(14) Wherever operating ratios are used, these are defined in terms of losses and expenses (including dividends paid to policyholders) related to premiums. When premiums exclude premium discount from the base, corresponding adjustments are reflected in the numerator and vice-versa.

This can be seen by comparing standard deviations for operating ratios with standard deviations for income (inclusive of investment income) to premium ratios and also by comparing standard deviations over time of each statistic. In virtually every case the inclusion of investment income reduces the standard deviation from the average. More simply put, the income to premium ratios, as bad as they are, would have been much worse without the availability of investment income.

Operating results are shown below:

Stock Company Operating Results Per $100 Of Net Earned Premium

	Average
1976	-$12.33
1975	-8.96
1974	-9.38
1973	-4.89
1972	-6.26

Notes: 1. Operating results per $100 of net earned premium comprise 100 times incurred losses plus incurred expenses plus policyholder dividends divided by net earned premiums.

2. Data are from the Insurance Expense Exhibit. For 1976 they are for all stock companies. Data for the years prior to 1976 are large samples (88 to 91 non-participating stock companies and groups).

To illustrate the substantial fluctuation in these averages, it should be noted that in 1975 the lowest and highest operating results per $100 of Net Earned Premium for companies with net earned premiums exceeding $1,000,000 were -$61.63 and +$34.12; for 1974 the corresponding results were -$41.80 and +$30.28.

Investment income operates as an offset to adverse net operating ratios. For example, the $8.96 industry loss in 1975, was offset in some degree by $6.95

average investment income (as developed from appendix D - see footnote 22)[15] per $100 of earned premium for the industry. Individual companies writing more than $1,000,000 of net earned premium realized as much as $13.53 or as little as $.02 per $100 of net earned premium (see Appendix F1). In these circumstances, it should be apparent that operating an insurance company in the workers' compensation insurance field is a "risky" business. In 1975, the industry needed to use up all of the investment income attributed (erroneously, in part) to policyholder supplied funds and still lost money. It was even more so in 1976. This should be contrasted with the theoretical ratemaking premise that the industry as a whole is expected (assuming no contingencies arise) to realize $2.50 out of each $100 of earned premium, plus actual investment income.

Subsequent discussions refer to stock insurance company figures, although a review of mutual insurance company statistics in Appendix E will show that similar results follow.

The fluctuations in the individual results are explained on the basis that insurance is not like most other businesses. The claims, i.e. reserves for losses, are the most significant part of an insurance company's inventory. Whereas most businesses can know the value of their inventory with little or no error, the insurer's inventory is subject to radical fluctuation because of future events such as error of estimation of the value of known claims or in subsequent identification of claims not known at the date of inventory closing.[16] These fluctuations

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(15) As mentioned earlier investment income as presented in Insurance Expense Exhibits is computed in accordance with N.A.I.C. instructions allocating total investment income, excluding earnings on stocks, on the basis of line-by-line reserves. Consequently, for lines for which losses exceed ratemaking expectations, investment income can be considered overstated to the extent that funds are borrowed from surplus to create reserves. Adjustment of data to recognize this phenomenon would indicate greater riskiness and need for greater contingency elements than presented in this paper.

(16) Claims thought to be non-compensable medical become compensable, those believed temporary become permanent, etc., leading to the need for large reserves subject to substantial errors of estimation.

in number and amount carry through into aggregate loss estimations. The mean industry averages of net operating ratios are inadequate estimates of future needs of the individual company. The mean averages by company are distributed about the industry average and are relatively widely dispersed. Statistically, such dispersion can be measured by the standard deviation. In the year 1976, the standard deviation of the net operating ratio was $11.80 per $100 of earned premium. In 1975, it was $8.86. In 1974, it was $8.87. In 1973, it was $5.55. In 1972, it was $6.78. For the five years the standard deviation was approximately equal to or slightly larger than the average industry loss.

Net operating ratios are not as useful for ratemaking as are loss ratios based upon standard premiums. The latter are more directly related to manual rates and permit an evaluation of such manual rates independent of the effects of expense economies (premium discounts) which are actually afforded on the basis of risk size. Further, it permits analysis of experience for insurers with a variety of operating philosophies. Consequently, we should look at the relationship between investment income and the fluctuation in loss ratio expressed as a percentage of earned standard premium.

In 1976, investment income averaged 6.74% of earned standard premium before tax and this amount was available to partially offset the variation in loss ratio to an extent somewhat less than one standard deviation in loss ratio which amounted to 10.72% of earned standard premium. In 1975, 6.46% of earned standard premium was available through investment income to offset almost one standard deviation in loss ratio which amounted to 8.16%. In 1974, the comparable figures were 5.37% and 7.50%. In 1973, the comparable figures were 4.73% and 6.21%. In 1972, the comparable figures were 4.66% and 6.30%.

The five year average relationship of investment income to the standard deviation of loss ratios is shown below:

	Percent of Standard Premium		
(1)	(2)	(3)	(4)
Year	Investment Income	Std. Deviation of Loss Ratio	Ratio (2)÷(3)
1976	6.74%	10.72%	.63
1975	6.46	8.16	.79
1974	5.37	7.50	.72
1973	4.73	6.21	.76
1972	4.66	6.30	.74
Average	5.59%	xx	.73

Current provisions of 2.5% for profit and contingencies and 1976 investment income of 6.74% together represent only 86% of 10.72%, one standard deviation in loss ratio for 1976. If ratemaking actually achieved the 2.5% for underwriting profit, this would mean that 20% of the business (intermediate between 19.0% and 22.7% as shown in Section III-D)would suffer a net income loss. (This contrasts with actual 1976 results prior to adjustments to average wherein 54.6% of the business suffered a net income loss.)[17] Such a program definitely is not based on an excessive premium base.

IV. Further Considerations:

IV-A. Investment Income and Rates of Return. Some persons, in arguing for rates of return based on net worth, have stated that one way of enhancing such rates of return would be for the corporation to incur long term debt, i.e., issue bonds, so-called "senior securities", as is done in the public utilities industry and some other regulated businesses. The issuance of bonds commonly is not a practical consideration with respect to the insurance business because insurance laws and

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(17) 54.6% = $3,649,252,709 (Net Premium for Insurers with Net Income Loss) ÷ $6,682,337,100 (Total Net Premium for Stock and Mutual Insurers)

the general purposes of insurance require maximum protection for the policyholder and the claimant. The policyholder and the claimant generally will have first call on the assets of the insurance company. Therefore, issuance of debentures which would be subordinated to the claims of policyholders and claimants are generally unattractive to investors. Consequently, growth in the insurance business is actually financed through internal means.(18)

In attempting to assess appropriate rates of return in regulated businesses, Plotkin(19) has drawn comparisons between insurance and other businesses subject to regulation. He has made the point that loss reserves and unearned premium reserves in insurance serve a function similar to long-term debt in other regulated businesses. In insurance, the assets underlying loss reserves and unearned premium reserves are at risk just as, for example, telephone equipment, railroad cars, aeroplane equipment, etc. are part of the business operation. In insurance, the situation is somewhat more complex in that not only are the assets underlying these reserves at risk but the actual settlement values of losses are subject to variation and, in the light of history, tend to exceed initial reserves.

Thus in Plotkin's comparison of insurance with other regulated industries, he points out that for the non-insurance industry, rate of return includes net income plus the corporation's cost of servicing the long term debt related to basically, usefully employed plant and equipment or, approximately, net assets. In insurance, the appropriate measure is the underwriting net income plus the investment income generated by loss reserves and unearned premium reserves stemming

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(18) "Because of the first claim of debt to income, the risk... is greater than the risk of an investment in a firm without debt... insurers seldom issue debt-an obligation to repay borrowed funds would conflict with the role of capital as a guaranty fund in an insurance company..." supra-Mass.Adv.Sh.(1976)2068 (footnote 32)

(19) "Statement of Dr. Irving Plotkin, Senior Economist, Director of Regulation and Economics, Arthur D. Little Inc., on Investment Income and Rate-Making for Property Insurance, before the Texas State Board of Insurance, Austin, Texas, February 16, 1977."

from policyholder supplied funds plus the investment income generated by net worth. This sum is measured against net worth plus the loss reserves and unearned premium reserves or, approximately, net assets.

Plotkin's comparison can be developed further. The use of investment income generated by the reserves in lieu of a substantial profit and contingency factor is seen to be the companies' consideration afforded to the policyholder for the use of policyholder supplied funds. It is entirely comparable to the monetary consideration afforded to bond holders for borrowing by regulated business. This furnishes additional perspective on the interrelationship between investment income and the underwriting profit and contingency margin. The two taken together represent the total consideration and should be measured against the combined sum of net worth and reserves. Rates of return measured in this way reflect a consideration of the total riskiness of the enterprise. Such riskiness necessarily is found to be at a level higher than that of a regulated monopoly such as a public utility. The rationale for this conclusion should be obvious in that insurance is a competitive business with substantial market dispersion of the product and ease of entrance and egress by insurers of various types in competition with each other. In terms of hierarchy, it is reasonable to conclude that rates of return measured in the manner described above should be larger than that afforded, e.g., to competing airline carriers in that the latter industry is not as competitive as insurance. Ease of entry and egress is considerably less for airlines than for the insurance industry and, as a capital intensive industry, airlines are able to generate substantially more leverage between capital and long term debt than insurers can develop between net worth and loss reserves and unearned premium reserves.

Actual 1972-1976 net investment yield on assets available for investment is shown in Appendix A. This, together with the non-participating stock company

workers' compensation insurance operating ratios shown in Section V-B provide a reasonable basis for appraising the total return from writing workers compensation insurance. (In the following, the operating ratios expressed as a percentage of premiums have been adjusted by a factor of 50% to reflect the fact that premiums for all lines constitute approximately 50% of assets.) The results are shown below:

Workers' Compensation Insurance Estimated Return on Assets Available for Investment
(Before Federal Income Taxes)

Year	Investment Income(20)	Operating Ratios	Total Return(20)
1972	4.4%	-3.2%	1.2%
1973	4.8	-2.4	2.4
1974	5.6	-4.7	0.9
1975	5.8	-4.6	1.2
1976	5.6	-6.0	-.4
5 Year Total	5.3%	-4.4%	0.9%

The foregoing can be modified to show what the projected returns would have been if the 2.5% profit and contingency factor were actually achieved.

Workers' Compensation Insurance Projected Return on Assets Available for Investment
(Before Federal Income Taxes)

Year	Investment Income(20)	Operating Ratios	Total Return(20)
1972	4.4%	1.3%	5.7%
1973	4.8	1.3	6.1
1974	5.6	1.3	6.9
1975	5.8	1.3	7.1
1976	5.6	1.3	6.9
5 Year Total	5.3%	1.3%	6.6%

(20) Does not include capital gains or losses. Standard and Poor's combined index (500 stocks) showed an approximate increase of 5% for the total five year period. Changes in the value of bonds are not included.

The difference between the 0.9% figure and the 6.6% estimate before Federal Income Taxes points up the riskiness of the insurance business both from an underwriting and total income viewpoint. On an after tax basis the 5 year total projected return on assets would be approximately 5.2%, which is indeed a modest return. For comparative purposes we show the annual after-tax rates of return on total capital developed from data reported to the Federal Trade Commission and the Securities and Exchange Commission.(21)

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(21) As reported in Table 2, p.23 [sic], in Plotkin, I.H., On the Theory and Practice of Rate Review and Profit Measurement in Title Insurance, A.D. Little Inc., 1978.

TABLE 2

ANNUAL AFTER-TAX RATES OF RETURN
ON TOTAL CAPITAL
FTC/SEC COMPANIES
1960-1967

Year	Rate of Return*
1966	11.52%
1967	10.06
1968	10.22
1969	9.75
1970	8.65
1971	8.86
1972	9.48
1973	11.10
1974	12.60
1975	10.08
1976	11.95
1973-1976	11.43
1966-1976	10.38

*Rate of return on total capital defined as net income after tax plus interest, divided by net worth plus debt. Interest calculated assuming embedded debt costs of 5% for 1966-1969 and 7% for 1970-1976.

Source: Developed from Federal Trade Commission/Securities and Exchange Commission, Quarterly Financial Reports.

IV-B. An Economic Model for Capitalization of a Workers' Compensation Insurer: The question sometimes arises as to how much net worth is necessary in order to write workers' compensation insurance. Since there are hardly any insurers who write only workers' compensation, we can answer this question only by constructing a model. In our model we begin with a net worth equal to 50% of the earned premium. In its oversimplified form we first assume that the underwriting target of 2.5% will invariably be reached in every year, investment income will amount to 5% of earned premium, federal income taxes will be payable at 48% on underwriting and at 15% on investment income; premiums will increase at 20% per year; after federal income tax investment earnings on net worth will be paid out as dividends to owners.

IV-B-1. The 2 to 1 Ratio of Premium to Net Worth: If we begin with a net worth of 1,000 units and a premium of 2,000 units, by the end of the first year net worth will have increased to 1,111 units (underwriting income after federal income taxes equals 2.5% x 2,000 units x 52% after tax retention rate or 26 units, and investment income after federal income taxes equals 5% x 2,000 units x 85% after tax retention rate or 85 units, for a total increase of 111 units), and this will be the underlying capital related to the second year's premium of 2,400 units. The figures for each of the years are displayed in the following table:

Year	Premium	Beginning Net Worth	Ratio
1	2,000	1,000	2.00
2	2,400	1,111	2.16
3	2,880	1,244	2.32
4	3,456	1,403	2.46
5	4,147	1,595	2.60
6	4,976	1,825	2.73

It will be seen that the ratio of premium to net worth increases at a decreasing rate. However, the foregoing description does not describe the real world because it allows neither for failure to achieve expectations nor for the possibility that expectations are exceeded. In order to more closely reflect reality we need to modify the description to reflect real world facts such as the following which occurred during the years 1972-76:

	RETURN[22] AS RATIO TO EARNED PREMIUM FROM	
	Underwriting	Investment
Year 1972	-.063	+.050
1973	-.049	+.051
1974	-.094	+.059
1975	-.090	+.070
1976	-.123	+.072

When these actual conditions are recognized, the results change enormously. Because each of the years produces underwriting losses, the following computation assumes that there will be no federal income tax payable on investments. The relationship between premium and net worth as modified is shown below.

Year	Premium	Beginning Net Worth	Ratio
1	2,000	1,000	2.00
2	2,400	974	2.46
3	2,880	979	2.94
4	3,456	878	3.94
5	4,147	809	5.13
6	4,976	598	8.32

It will be seen that by the beginning of the sixth year, the industry is operating at a premium to net worth ratio of 8.32, an increase of more than 30% per year. Such a condition is quite risky - risky to claimants, risky to policyholders,

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(22) See Appendix D. The figure for underwriting is one minus the operating ratio which includes dividends paid to policyholders. The figure for investment is the difference between the Income/Premium ratio and the underwriting figure.

risky to stockholders, and risky to the economic security of society in general.[23] However, even this does not tell the entire story. A study presented to the Casualty Actuarial Society Workshop in November, 1977 indicates that as of the end of 1976 (the 5th year in our example) companies on the average were underreserved for IBNR losses to the extent of 8% of earned premium (see Appendix H). In our example, this amounts to 8% of 4,147 units or 332 units which would need to be deducted from the 598 units of net worth at the beginning of the 6th year and leave 266 units, this would then produce a premium to net worth ratio of 18.71.

One of the reasons that the ratios have not actually become as large as the model indicates is that net worth during the last five years has been augmented by an increase in unrealized appreciation of stocks. However were the stock market to decline by as much as 25% during the fifth year, in our model net worth would have declined an additional 202 units assuming that the fifth year's net worth were all invested in stocks[24]; net worth would then constitute 64 units. Such a bleak scenario would place the industry on the brink of insolvency at a premium to net worth ratio of 77.75. It is a situation which might happen. It probably would be prevented from happening by drastic action by insurance regulators. But it demonstrates the implications of unwarranted cut-backs in the pricing program, including the use of investment income reserves, as we know it today.

IV-B-2. The 1 to 1 Ratio of Premium to Net Worth - A Realistic View: Prudent evaluation of the real world situation requires that premium to net worth ratios be more nearly 1.00, so as to make it rare that the ratio in any given year would

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(23) It should be noted that investments in bonds, being recorded at amortized values, do not exhibit the volatility of investments in stocks (which are generally carried at market values) thus permitting higher premium to net worth ratios for a given degree of solvency for companies whose major investment is in bonds.

(24) This is consistent with legal requirements that reserve liabilities for unearned premiums and claims be invested in bonds; these are recorded at unrealistic amortized values during periods of declining bond prices.

reach the warning level of 3.00 for the industry as a whole.[25] We can take the previous model which reflects real underwriting and investment results and modify it to begin at a ratio of 1.00 and also reflect that net worth at the end of each year will include the changes in the stock market (based upon the movements of the Standard and Poor Index[26] from December of the prior year to December of the current year). The percentage change is applied to the net worth at the beginning of the year. The results of this real world situation are shown below:

	1	2	3	4	5	6
1. Year						
2. Premium (20% Annual Growth)	2,000	2,400	2,880	3,456	4,147	4,976
3. Net Worth Beginning of year (Line 7 of prior year)	2,000	2,344	1,897	1,242	1,573	1,645
4. Net Operating Income During Year after Federal Income Tax	-26	+5	-101	-69	-211	
5. Net Worth End of Year w/o Unrealized Capital Gains ((3)+(4))	1,974	2,349	1,796	1,173	1,362	
6. S&P Change Index During Year						
(a) Per Cent	+18.5%	-19.3%	-29.2%	+32.2%	+18.0%	
(b) Amount ((3)x(6a))	+370	-452	-554	+400	+283	
7. Net Worth End of Year with Unrealized Capital Gains: ((5)+6(b))	2,344	1,897	1,242	1,573	1,645	
8. Premium to Net Worth Ratio:((2)+(3))	1.00	1.02	1.52	2.78	2.64	3.02

Notes: (a) Line 4 assumes after tax investment income from net worth is distributed as dividends to owners.
(b) S&P change index is measured from previous to current December index.
(c) Years 1-5 correspond to 1972-1976. Underwriting and investment percentages for those years were applied to the corresponding earned premiums. Since underwriting losses offset investment incomes no federal income tax was assumed.

Now, by reducing the 5th year's end net worth by 332 units for the 8% deficiency due to inadequate loss reserves (see appendix H), there would be left 1,313 units which would then make the 6th year's premium to net worth ratio 3.79. If we

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(25) Currently, the National Association of Insurance Commissioners employs a ratio of 3 to 1 in its test of solvency.

(26) Standard & Poor's combined Index (500 Stocks) - Survey of Current Business (U.S. Dept. of Commerce/Bureau of Economic Analysis) and the 1975 Biennial Supplement.

further assume a drop in the stock market of 25% instead of the 18.0% increase during the 5th year, this would cause a reduction of 393 units instead of the 283 unit increase shown in the table; the final number of units would be 637 (637=1313-283-393) for a premium to net worth ratio of 7.81, a dangerous situation (a combined net income and stock market loss equal to 13% (13%=1÷7.81) of premium would wipe out the entire industry) but not nearly as volatile as the 77.75 ratio we encounter, where we began with a 2 to 1 ratio. There a combined net income and stock market loss equal to only 1.3% of premium would wipe out the entire industry.

The recent history of underwriting, investment income, and stock market performance demonstrates that workers' compensation insurance is indeed a "risky" business. The risk assumed by insurers in writing workers' compensation consists of both diversifiable and non-diversifiable (systematic) elements as described elsewhere in this restatement. For example, insurance provides the mechanism whereby "social inflation" is diversifiable for the insured but not for the insurance industry.(27) Accordingly, a fair expected total return for insurers must reflect both sources of risk. In light of recent experience, the insurance industry can attract only limited outside venture capital due to its record of low returns and high total risk. The role played by investment is to generate such capital internally and to smooth out adverse underwriting results. Finally, it should be observed that net worth is stated at current market values of stocks (surely, such massive volumes could not readily be sold without depressing the stock market) as a way of providing the capital necessary to fund premium growth. It is erroneous to believe that 2.5% of premium alone is adequate for profit and contingencies.

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(27) The investment policy of an insurer is to some extent determined by its position vis a vis premium, net worth and riskiness of the fluctuation inherent in the line of insurance; the greater the fluctuation and the larger the premium to net worth ratio, then the greater will be the investment of net worth in bonds which are carried at amortized values (i.e., insulated from the vagaries of the stock market).

V - Review of Ratemaking Considerations.

V-A. General Considerations: The structure and function of investment income and the contingency factor have been reviewed. It is now appropriate to address the question of whether investment income should be incorporated in ratemaking and subjected to periodic review in the same manner as underwriting experience.

Underwriting and investments are two separate and distinct operations of casualty insurance companies, and two separate and distinct opportunities for profit. Underwriting profits represent the residue, if any, remaining after losses and expenses incurred during a given period are subtracted from premiums earned during that same period. Investment profit, however, is derived from the intelligent investment of funds in the possession of the carriers, to the extent that it is prudent for the carriers to make such funds available for investment. In practice these two functions are handled as completely separate operations of the insurance company. Their distinctness is well recognized in the NAIC Annual Statement blank. In the Statement of Income portion of the Underwriting and Investment exhibit, the carrier is required to make a separate accounting of underwriting income and investment income.

In spite of the traditional and well recognized separability of these two operations, the view is sometimes advanced that underwriting data and investment income should somehow be intermingled in the ratemaking procedure. Investment income aggregates are not ratemaking experience data and should not be treated as such; neither should investment income be used as an automatic reduction from the margin for underwriting profit and contingencies or any other element of workers' compensation rates with no consideration given to the reasonableness of the pricing program in its entirety, including the provision for underwriting profit and contingencies. That the statutory scheme does not call for any such conclusion, absent

clear instruction to the contrary, would seem to allow for little argument. Why such a conclusion should in no event be arrived at merits the following discussion.

A second reason why there should be no attempt to bring investment dollars into the mechanics of ratemaking is the likely effect upon the investment policy of individual companies. The investment policy a particular company should adopt depends on many factors including the relative size of its capital and surplus account. If a high level of surplus is available, higher yield from more volatile investments may safely be sought. Introducing an investment income element into the rate formula would tend to induce some companies to shift from more conservative investments, to the detriment of the public interest in maintaining high standards of solvency. A company which feels it needs to keep an appreciable portion of its reserves for workers' compensation insurance either in the form of cash or comparatively low-yield investments, should not be discouraged from so doing by the ratemaking procedure.

A third reason is that a drop in investment dollars because of fluctuating economic conditions must of necessity be made up by increased rates under this theory. Coupled with the incentive toward more speculative investing alluded to above, there may very well be an aversion to a "two-way" operation on the inclusion of investment income; and yet, to conduct the program on any other basis would tend to produce a pricing bias against the carriers.

A fourth reason is that if investment income earned by insurance companies were taken into account in the mechanics of workers' compensation insurance ratemaking, the present provision of 2.5% of premium for profit and contingencies would be completely inadequate. The 2.5% profit and contingencies factor produces, at best, marginal rates today. Obviously, if the modest 2.5% profit and contingencies factor were reduced or eliminated it would make it increasingly more difficult to attract capital to this business.

Finally, consideration would have to be given in the ratemaking procedure to the particular type of investments properly attributable to reserve accounts. Since these accounts generally represent liabilities that must be met promptly, the assets represented by them would generally be invested in highly liquid low-yield securities, or held as cash or its equivalent. Very probably the reserve funds are invested differently for the several lines of insurance depending on the particular company's relative volume by line and the degree of liquidity necessary.

The companies writing workers' compensation insurance are not monopolistic utilities. There are a sizable number competing for the business in every state. In addition to competing in final premium charged, they are competing strenuously with each other in the service and attention which they render to policyholders. Therefore, they are entitled, even though regulated, to that profit on sales which prudent management feels is necessary for the long-run good of the business.

With this background, it is evident that the underwriting profit and contingencies allowance (if earned), plus the investment income on reserves adds up to a most modest income for workers' compensation insurance carriers. Otherwise expressed, the rates meet all of the standards set forth in the rating law, and due consideration has been given to investment income from unearned premium reserves and loss reserves, as well as all other factors deemed relevant.

V-B. Specific Considerations: The investment income with the addition of any underwriting profit (loss) make up a company's earnings from this line of insurance.

In considering the propriety of the potential earnings to be derived by writing a line of insurance, it is appropriate and necessary to review the earnings history of that line of insurance. Such review will provide a benchmark for analysis of the risks involved in writing the line of insurance and will indicate whether the potential earnings are adequate to cover such risks.

INVESTMENT INCOME

The actual countrywide experience of company groups which were predominantly non-participating, in each of the past five years has produced costs in excess of the premiums charged for workers' compensation insurance coverage as is shown in the following table (000 omitted).

	1972	1973	1974	1975	1976	1972-76
1. Net Premiums Earned	1,972,294	2,330,990	2,653,355	2,888,816	3,346,357	13,192,112
2. Total Incurred Losses	1,398,716	1,632,695	1,956,503	2,171,644	2,655,369	9,814,927
3. Total Incurred Expenses(a)	698,081	811,347	944,468	982,262	1,092,475	4,528,633
4. Operating Results (1)-(2)-(3)	-124,503	-113,052	-247,616	-265,090	-401,187	-1,151,448
5. Operating Ratio (4)÷(1)	-6.3%	-4.8%	-9.3%	-9.2%	-12.0%	-8.7%

(a) Excludes Federal Income and Excess Profits Taxes and includes dividends paid to policyholders.

The adverse results achieved in the country as a whole during the last five years demonstrate that the historical profit and contingency margin of 2.5% of premium was not sufficient to cover the contingencies which existed.

While contingency margins cannot be set high enough to offset truly disastrous results such as those of 1974, 1975 and 1976, the recent history of Workers' Compensation insurance in the United States clearly indicates the potential and realized magnitude of the risk assumed by the insurance companies. It is prudent, therefore, to retain the historical profit and contingency provision which has proven to be necessary.

With respect to policyholder supplied funds, the investment income from premium combined with the operating results comprise the total earnings (before Federal Income Taxes) achieved by the non-participating stock insurance industry nationally on the workers' compensation line as shown below (000 omitted):

COUNTRYWIDE TOTAL EARNINGS FROM WORKERS' COMPENSATION INSURANCE PREMIUMS
(BEFORE FEDERAL INCOME TAXES) (000 OMITTED)

(1)	(2)	(3)	(4)	(5) TOTAL EARNINGS	(6)
Year	Net Premiums Earned	Operating Results	Investment Income From Premiums	Amount (3)+(4)	Per Cent (5)÷(2)
1972	1,972,294	-124,503	86,968	-37,535	-1.9%
1973	2,330,990	-113,052	108,292	-4,760	-0.2
1974	2,653,355	-247,616	138,059	-109,557	-4.1
1975	2,888,816	-265,090	185,325	-79,765	-2.8
1976	3,346,657	-401,187	207,156	-194,031	-5.8
1972-76	13,192,112	-1,151,448	725,800	-425,648	-3.2%

We can evaluate the potential earnings from policyholder supplied funds in standard premium ratemaking terms. The components are the potential profit and contingency element of 2.5% of standard premium, the five year historical investment earnings of 4.98% of standard premium reflecting an adequate premium base (see Section II-D) and the Federal Income Tax structure. These indicate a potential earnings of 5.6% of standard earned premium after tax as shown below:

	Per Cent of Standard Earned Premium
Underwriting Profit and Contingency Margin	2.5%
Federal Income Tax @ 48% on Underwriting Profit and Contingency Margin	1.2
Underwriting Result after Federal Income Tax	1.3
Estimated Investment Income after Federal Income Tax	4.3(28)
Potential Total Earnings as a % of Premiums	5.6

(28) As per Section II-D

Despite potential earnings of 5.6% of standard earned premium, actual before tax earnings with investment income from premiums on a present value basis averaged -3.1% per year as a per cent of standard earned premium. While the achieved earnings are plainly unsatisfactory, even the potential earnings are not at a very high level when one considers that retained earnings are the chief vehicle for funding premium volume growth. Over the last five years, total workers' compensation premium volume, i.e., demand for workers' compensation insurance, has increased at an average rate exceeding 14% per year. This increase was caused by a variety of factors. Among these factors were the general inflation, particularly medical cost inflation, inflation in wages resulting in higher benefit levels, increases in legislated benefit levels and increases in the number of covered workers.

The riskiness of the insurance business has long been recognized by the establishment of conservative accounting practices and by setting bench mark premium to surplus ratios at a low level. One of the current NAIC Regulatory Tests states that a premium to surplus ratio exceeding 3 to 1 is a potential danger signal of insolvency. Earlier it was shown that a 1 to 1 ratio for workers' compensation insurance is more prudent. Looking ahead to be able to meet a premium volume growth of 20% per year, the after tax workers' compensation insurance earnings should be at least 20% of premium so as to promote a 1 to 1 premium to surplus ratio. The Kenney rule, which is considered prudent for most casualty lines riskier than fire lines, suggests that a premium to surplus ratio of 2 to 1 is more appropriate. In order to maintain this less prudent premium to surplus ratio, the after tax earnings should be at least 10% of premium.

Considering the future growth in demand for workers' compensation insurance in the United States, it is possible that the total potential earnings achievable under the current pricing program may not be sufficient to fully fund the

growth in demand. As shown previously, the potential after tax earnings of 5.6% of premiums available to fund the growth of premium volume are based on retaining a profit and contingency margin of 2.5% of premium plus investment income. Certainly, should the potential earnings be reduced by lowering the profit and contingency margin, it must be expected that significant deterioration in the average insurer's financial strength will occur. Such deterioration will of necessity adversely impact the availability of workers' compensation insurance generally.

VI. Summary and Conclusions.

To summarize, net investment income operates as an offset to two contingencies; namely, (1) the contingency that the insurance industry as a whole does not meet the target results contemplated and (2) the contingency that even if the industry as a whole were to meet the target, then many individual companies would still require investment income to stay in business and to offset the contingency that its results would in some degree be more adverse than the average. Thus, the combined elements of 2.5% expected return for underwriting profit and contingency plus the realized investment income represent a very modest expectation for undertaking the risk inherent in the insurance business. At the same time, the ratemaking system, based on an underwriting profit and contingency allowance, insulates the policyholder from the investment risk which a particular insurance management may undertake, i.e., investing in riskier securities or writing insurance at large premium to surplus ratios; these latter risks remain with the insurer and are not "retroceded" to policyholders through ratemaking.

Realistically, the insurance industry as a whole has not achieved the underwriting target set by ratemakers. Even if conditions worked out "on the average" as expected, 33.6%[29] of the workers' compensation insurance business

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(29) See Section III

would fail to realize as much as 2.5% in underwriting profits, i.e., actual contingencies will exceed the contingency factor for more than 33% of the business. Modifications of ratemaking have been undertaken to recognize that the statistical data base for ratemaking of necessity reflects conditions of the past and that it requires adjustment to anticipate conditions during the period when new policies will be in force. Nevertheless, even if ratemaking were perfect, there still would be a need to deal with the likelihood that more individual companies would face insolvency than is warranted by the public interest.

The history of underwriting losses indicates that contingencies have not been adequately reflected. New contingencies are constantly coming to the fore. An expanding "state of the art" and increased awareness of occupational disease and cumulative injury resulting from continuous activity such as repetitive motion, etc., are current examples. It is quite possible that escalation (i.e., adjustment of future benefits to claimants for claims on old cases) will be another. Such elements might render the fluctuation in investment income and individual insurer's underwriting results minor considerations compared to the non-diversifiable or systematic risk in a changing society. Indeed, these considerations could indicate the need for an additional contingency element. This is confirmed by the steady upward movement of the 1972-1976 standard premium loss ratio which actually went from .6606 to .7522. The five year average loss ratio[30] was .6881 with a standard deviation of .0396.

In the National Council's view, the proven riskiness of the insurance business requires that the present underwriting provision for profit and contingenc.

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(30) See Section III

of 2.5% be considered as a minimum. As it stands, it can be expected that, even if the industry achieves this, it will result in exhaustion of both contingencies and investment income by 19% to 23% of the business. Any changes which might be made should be in the direction of increasing the 2.5% profit and contingency factor to recognize the risks inherent in the business.

APPENDICES

APPENDIX-A

STOCK COMPANIES

INVESTMENT INCOME AS A % OF ASSETS†

	1972	1973	1974	1975	1976	5yr. Total
(1) Total Mean Admitted Assets*	53,897,085	60,337,185	61,253,821	65,004,745	76,644,141	317,136,977
(2) Mean Premium Balances*	4,179,107	4,944,194	5,426,389	5,854,717	6,515,393	26,919,800
(3) Mean Other Assets*	2,648,135	3,422,304	4,105,166	4,437,142	4,957,028	19,569,775
(4) Mean Assets Available for Investment*	47,069,843	51,970,687	51,722,266	54,712,886	65,171,720	270,647,402
(5) Investment Income*	2,232,408	2,655,294	3,084,128	3,347,168	3,856,958	15,175,956
(6) Investment Income Yield Rate %	4.74%	5.11%	5.96%	6.12%	5.92%	5.61%
(7) Investment Expenses Incurred*	164,156	174,077	193,547	204,306	228,044	964,130
(8) Investment Expense %	.35%	.33%	.37%	.37%	.35%	.36%
(9) Net Rate Investment Yield as %	4.39%	4.78%	5.59%	5.75%	5.57%	5.25%

*In thousands

†Data from Best's Aggregates and Averages - Property and Casualty

Investment Income on Unearned Premium Reserves

The attached exhibits present estimates of investment income from unearned premium reserves for stock carriers based on countrywide data covering Calendar Years 1975 and 1976.

An explanation of certain of the items in the exhibits follows. The items are assigned the same number as the lines on the exhibit.

1, 2 - These figures were obtained from Best's Fire and Casualty Aggregates and Averages. (Hereinafter referred to as Best's).

4(a) - It is estimated that workmen's compensation premiums are remitted on the average approximately 105 days after effective dates of policies. This is 7/24 of a year, and, thus, a .292 reduction factor is applied to the mean unearned premium reserves.

The average delay in remission of premiums for all fire and casualty lines combined is approximately 60 days. This is derived from the ratio of premium balances to net premiums written for stock companies, as shown in Best's, together with a small increment for the non-admitted premium balances over 90 days due. In workmen's compensation insurance premiums are actually collected by the carriers at a much slower rate than that for most other lines. This is due to the fact that virtually all workmen's compensation policies are written on a payroll audit basis, with either a single audit made after the termination of the policy or interim audits made during the policy term. Of necessity, there is usually about a two month delay in making audits, and on balance the results of audits show a substantial excess of additional premium due over premium returns.

It is estimated, therefore, that there is an additional 45 day delay in remitting workmen's compensation premiums over the average 60 day delay applicable to all lines combined.

4(b) - Deduction is taken here of certain items of expense which must be prepaid by the carrier out of its own resources since at inception 100% of the premium is allocated to the unearned premium reserves. The amount of the deduction has been reduced to recognize the delayed remission of premium referred to in 4(a) above. The figures cited below (except the Allowance for Profit and Contingencies) were obtained from the Insurance Expense Exhibit compilation prepared by the National Council and distributed to all Insurance Departments:

Item	1975	1976
Commission	9.3%	9.1%
Other Acquisition	2.4	2.2
50% of General Expense	3.4	3.1
Taxes	4.1	4.1
Allowance for Profit and Contingencies	2.5	2.5
	21.7%	21.0%

These deductions for the Accounting Method are, in our opinion, conservative for the following reasons:

a. The rates of Commission and Other Acquisition expenses actually incurred and employed in the calculation reflect such expenses from all sized risks, including a substantial volume of business derived from the larger insureds. With respect to the larger risks, the rates of commission are lower and the greater proportion of the premium is developed on interim audits. These audits are made usually monthly or quarterly and when billed represent earned premium in full. Unearned premium reserves are developed only from deposit premiums and additional premiums charged by endorsement during the policy term. Since the smaller risks are not the ones normally using the interim audit arrangement, it can be assumed that a great proportion of the premiums going into the unearned premium reserve is derived from the smaller risks with their relatively higher rate of commission. Thus, it is a fair assumption that the many thousands of risks with premium under $1,000 require expenditure of 17.5% for commissions and other acquisition at inception (this is the allowance for Acquisition applicable to the 1st $1,000 of premium) and the deposit premium from these same risks must be allocated to the unearned premium reserve without deduction for this expense.

b. Concerning interim audits, this method of operation is the equivalent of a negative investment income. First, the premium is not developed until the exposure to loss has gone by and, second, there is a 60 day delay in remitting the premium through the agent. What this means is that as respects any one risk, the payment of any loss is coming from company surplus and any recovery to surplus will not take place until several months later when the interim audited premiums are remitted.

c. Only 50% of the General Expense item has been assumed as applicable at inception of the policy. This is to recognize that payroll audit and the preparation of unit cards represent expenses incurred after expiration of the policy. It could be reasoned, however, that these are

offset somewhat by the expenditure of the allowance for inspection for this expense starts when business is written. It is quite probable that more than 50% of the General Expense is absorbed at or near the inception of the policy.

8 - The average net rate of return is the five-year average ratio of investment income to all assets available for investment and was based on data for stock companies from Best's. The figure was reduced for investment expense which is the five-year average ratio of investment expenses incurred to all assets available for investment and also was based on figures from Best's.

10 - This is derived from net earned premium aggregates for stock companies as reported in Best's, converted to a standard premium basis by application of the ratio of standard to net premium from National Council calendar year experience.

12 - The Federal Income Tax used here was calculated by applying the Federal Tax rates to the distribution of assets for stock companies appearing in Best's.

STOCK COMPANIES - WORKERS' COMPENSATION

INVESTMENT INCOME ON UNEARNED PREMIUM RESERVES
(1975 Countrywide Data, Last Three 000 Omitted)

1.	Unearned Premium Reserve - 12-31-74	1,133,391
2.	Unearned Premium Reserve - 12-31-75	1,300,137
3.	Mean Unearned Premium Reserve in 1975	1,216,764
4.	Deductions	
	*(a) Delayed Remission of Premiums .292 x (3)	355,295
	**(b) Accounting Methods	216,428
5.	Net Subject to Investment (3)-(4a)-(4b)	645,041
6.	Average Rate of Return	5.40%
7.	Investment Expense	.36%
8.	Average Net Rate of Return	5.04%
9.	Investment Earnings on Net Subject to Investment (5)x(8)	32,510
10.	Standard Earned Premium for 1975	4,780,790
11.	Average Rate of Return as Percent of Earned Premium (Prior to Federal Income Tax) (9)+(10)	.68%
12.	Average Rate of Return after Federal Income Tax [86.9% x (11)]†	.59%

*To reflect delay in remitting premium to companies.

**Adjusted for the fact that commission and taxes are incurred upon receipt of premium. [.217 (3) - (4a) (.134)]

†100.0% - 13.1% = 86.9%.

STOCK COMPANIES - WORKERS' COMPENSATION

INVESTMENT INCOME ON UNEARNED PREMIUM RESERVES
(1976 Countrywide Data, Last Three 000 Omitted)

1.	Unearned Premium Reserve - 12-31-75	1,300,137
2.	Unearned Premium Reserve - 12-31-76	1,510,391
3.	Mean Unearned Premium Reserve in 1976	1,405,264
4.	Deductions	
	*(a) Delayed Remission of Premiums .292 x (3)	410,337
	**(b) Accounting Methods	240,941
5.	Net Subject to Investment (3)-(4a)-(4b)	753,986
6.	Average Rate of Return	5.61%
7.	Investment Expense	.36%
8.	Average Net Rate of Return	5.25%
9.	Investment Earnings on Net Subject to Investment (5)x(8)	39,584
10.	Standard Earned Premium for 1976	5,741,190
11.	Average Rate of Return as Percent of Earned Premium (Prior to Federal Income Tax) (9)÷(10)	.69%
12.	Average Rate of Return after Federal Income Tax [85.6% x (11)]†	.59%

*To reflect delay in remitting premium to companies.

**Adjusted for the fact that commission and taxes are incurred upon receipt of premium. [.210 (3) - (4a) (.132)]

†100.0% - 14.4% = 85.6%.

Investment Income on Loss Reserves - Countrywide

The attached exhibit presents an estimate of investment income from loss reserves based on a method of tracing payments of losses during the time premium from transactions giving rise to such losses is in the possession of the carriers. It is a method which is based on the use of actual statistical data showing the distribution of losses by type of injury and the average duration of cases by type of injury. For convenience, the calculations are expressed in terms of the amount of investment income per $10,000 of losses.

An explanation of certain of the columns on the exhibit follows:

Column (2) represents countrywide distribution of incurred losses by type of injury obtained from unit report summary data.

Column (4) represents the percentage of losses by type of injury which are estimated to be paid in installments and not paid in a lump sum. It is the best estimate of insurance company actuaries that all permanent partial non-schedule amounts and 50% of the schedule amounts are paid on an installment basis. The figures in column (4) for permanent partial cases are derived according to the relative weight of non-schedule and schedule losses in each type of injury category. With respect to the medical portion of permanent total and major permanent partial cases, see notes (a) and (b) at the bottom of the exhibit.

Column (6) has been obtained by dividing total incurred

average annual benefit by type of injury for this period. The average duration of medical losses in major permanent partial cases is estimated to be 75% of the duration of major permanent partial indemnity losses. The average duration of medical losses in minor permanent partial cases is estimated to be 50% of the duration of minor permanent partial indemnity cases.

Column (7) is the investment income at 5.25% per annum from the amounts in Column (5) for the duration indicated in Column (6). The Column (5) amounts will decrease each year as a result of payouts to injured workmen. Note, however, that under the National Council's Unit Statistical Plan death and permanent total cases involving life pensions must be reported on a present value basis at 3-1/2% interest. As respects these cases the investment income figures in Column (7) are overstated.

Line 11. The Federal Income Tax used here was calculated by applying the Federal Tax rates to the distribution of assets and capital gains for stock companies appearing in Best's.

INVESTMENT INCOME BASED ON $10,000 OF EXPECTED LOSSES - COUNTRYWIDE

(1) Type of Injury	(2) % of Countrywide Losses	(3) Col.(2) Expressed In Dollars	(4) % of Col.(3) Not Paid In Lump Sum	(5) Amount Not Paid In Lump Sum (3)x(4)	(6) Average Duration Of Case (Years)	(7) Investment Income (Based On 5.25% Rate of Return)
Death (Ind. Only)	6.15	615.00	93.83	577.05	10.2259	130.99
Permanent Total (Ind.)	5.25	525.00	100.00	525.00	13.5017	147.77
Permanent Total (Med.)	2.60	260.00	(a)	260.00	13.5017	33.81
Major P.P. (Ind.)	27.15	2,715.00	72.00	1,954.80	4.4537	230.08
Major P.P. (Med.)	9.67	967.00	(b)	967.00	3.3403(c)	45.80
Minor P.P. (Ind.)	15.29	1,529.00	74.00	1,131.46	0.8028	38.61
Minor P.P. (Med.)	6.37	637.00	100.00	637.00	0.4014(d)	13.21
Temporary Total (Ind.)	13.16	1,316.00	100.00	1,316.00	0.1385	18.66
Medical (Death,T.T., non-comp.,and contract)	14.36	1,436.00	-0-	-0-	-0-	-0-
TOTAL	100.00	10,000.00	xx	xx	xx	658.93

8. Permissible Loss Ratio (Excl. Loss Adj.)	.598
9. Standard Premium $10,000/(8)	16,722
10. Investment Income from Loss Reserves as a Percent of Premium Prior to Federal Income Tax : Sum (7)/(9)	3.94%
11. Average Federal Income Tax Rate	14.4%
12. Investment Income from Loss Reserves as a Percent of Premium after Federal Income Tax : (10)x[100%-(11)]	3.37%

(a) 50% of Permanent Total Medical Losses are paid in first year, 20% in second year, and 30% over remaining duration.
(b) 90% of Major Permanent Partial Medical Losses are paid in first year, and 10% over remaining duration.
(c) Major Permanent Partial Medical duration is 75% of Major Permanent Partial Indemnity Duration.
(d) Minor Permanent Partial Medical duration is 50% of Minor Permanent Partial Indemnity Duration.

APPENDIX-D

OPERATING RESULTS - STOCK COMPANIES*

Calendar Year	Net Premium		Standard Premium	
	Mean	Standard Deviation	Mean	Standard Deviation
1972:				
Loss Ratio	0.7078	0.0668	0.6606	0.0630
Operating Ratio	1.0626	0.0678	1.0585	0.0639
Income#/Premium	-0.0127	0.0636	-0.0119	0.0599
1973:				
Loss Ratio	0.7010	0.0590	0.6538	0.0621
Operating Ratio	1.0489	0.0555	1.0456	0.0526
Income#/Premium	0.0019	0.0558	0.0017	0.0528
1974:				
Loss Ratio	0.7379	0.0841	0.6761	0.0750
Operating Ratio	1.0938	0.0887	1.0859	0.0814
Income#/Premium	-0.0351	0.0858	-0.0322	0.0790
1975:				
Loss Ratio	0.7506	0.0900	0.6977	0.0816
Operating Ratio	1.0896	0.0886	1.0833	0.0820
Income#/Premium	-0.0201	0.0873	-0.0187	0.0813
1976:				
Loss Ratio	0.8053	0.1103	0.7522	0.1072
Operating Ratio	1.1233	0.1180	1.1151	0.1097
Income#/Premium	-0.0510	0.1099	-0.0477	0.1012

* Based on 91 companies or groups for 1972, 90 companies or groups for 1973, 91 companies or groups for 1974, 88 companies or groups for 1975 and all stock companies or groups for 1976.

\# Includes investment income.

Data from Insurance Expense Exhibits

APPENDIX-E

OPERATING RESULTS - MUTUAL COMPANIES*

Calendar Year	Net Premium Mean	Net Premium Standard Deviation	Standard Premium Mean	Standard Premium Standard Deviation	Net Premium After Dividends Mean	Net Premium After Dividends Standard Deviation
1972:						
Loss Ratio	0.6789	0.1397	0.6419	0.1373	0.7843	0.1631
Operating Ratio	1.0792	0.1727	1.0749	0.1676	1.0916	0.1880
Income#/Premium	-0.0148	0.1106	-0.0140	0.1068	-0.0171	0.1214
1973:						
Loss Ratio	0.6709	0.0918	0.6246	0.0844	0.7778	0.1070
Operating Ratio	1.0605	0.0820	1.0563	0.0775	1.0701	0.0912
Income#/Premium	0.0012	0.0697	0.0011	0.0654	0.0013	0.0800
1974:						
Loss Ratio	0.6858	0.1057	0.6310	0.1003	0.7959	0.1199
Operating Ratio	1.0775	0.1076	1.0713	0.1018	1.0899	0.1189
Income#/Premium	-0.0163	0.0900	-0.0150	0.0845	-0.0190	0.1017
1975:						
Loss Ratio	0.6896	0.0798	0.6437	0.0722	0.7812	0.1046
Operating Ratio	1.0530	0.0903	1.0495	0.0848	1.0601	0.1055
Income#/Premium	0.0133	0.0913	0.0124	0.0860	0.0150	0.1054
1976						
Loss Ratio	0.7206	0.0947	0.6874	0.0967	0.8028	0.0983
Operating Ratio	1.0470	0.0963	1.0449	0.0920	1.0524	0.1037
Income#/Premium	0.0155	0.0838	0.0147	0.0800	0.0172	0.0915

*Based on 71 companies or groups for 1972, 72 companies or groups for 1973, 68 companies or groups for 1974, 67 companies or groups for 1975 and all companies or groups for 1976.

#Includes investment income

Data from Insurance Expense Exhibits

OPERATING RESULTS FOR CALENDAR YEAR 1975 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREM
AETNA CAS & SUR GRP	$ 263,151,800	$ 195,197,110	$ 281,921,762	$ 4,266,088	0.7418	1.0713	0.0162
AETNA INS GRP	$ 62,227,427	$ 39,596,873	$ 61,913,572	$ 4,785,024	0.6363	0.9950	0.0769
AGWAY INS GRP	$ 89,717	$ 37,042	$ 101,055	$ -7,346	0.4129	1.1264	-0.0819
ALL STAR INS CO	$ 9,069	$ 27,956	$ 32,006	$ -21,553	3.0826	3.5292	-2.3766
ALL CITY INS CO	$ 1,916,504	$ 1,035,308	$ 2,254,278	$ -170,194	0.5402	1.1762	-0.0888
ALLIANCE ASSUR CO LTD	$ 1,812,830	$ 1,502,371	$ 2,161,476	$ -214,690	0.8287	1.1923	-0.1184
AMERICAN GENERAL GROUP	$ 78,563,259	$ 63,973,127	$ 89,961,268	$ -8,732,488	0.8143	1.1451	-0.1112
AMER HOME & NATL UNION GRPS	$ 26,705,607	$ 18,249,354	$ 28,324,422	$ -24,780	0.6834	1.0606	-0.0009
AMERICAN STATES INS COS	$ 16,598,079	$ 10,412,682	$ 16,312,867	$ 1,354,604	0.6273	0.9828	0.0816
AMER UNIVERSAL INS CO	$ 877,524	$ 669,025	$ 923,261	$ 22,016	0.7624	1.0521	0.0251
BITUMINOUS CAS CORP	$ 47,379,170	$ 33,759,774	$ 54,470,038	$ -1,574,506	0.7125	1.1074	-0.0332
CASUALTY INS CO	$ 5,380,136	$ 3,925,642	$ 5,731,324	$ -143,524	0.7297	1.0653	-0.0267
CENTENNIAL INS CO	$ 4,748,818	$ 2,877,883	$ 4,954,818	$ 159,657	0.6060	1.0434	0.0336
CHICAGO INS CO	$ 17,797	$ 120,986	$ 141,607	$ -123,810	6.7981	7.9568	-6.9568
CUMBERC UNION ASSUR COS	$ 140,665,401	$ 114,434,432	$ 164,633,989	$ -11,943,342	0.8135	1.1704	-0.0849
COMPANION INS CO	$ 13,991	$ 3,690	$ 10,620	$ 3,820	0.2637	0.7591	0.2730
CONTINENTAL INS COS	$ 243,527,992	$ 213,417,769	$ 292,933,760	$ -32,081,487	0.8764	1.2029	-0.1317
CNA GRP	$ 131,979,949	$ 102,701,298	$ 157,670,679	$ -10,604,413	0.8160	1.1947	-0.0803
COVENANT INS CO	$ 563,595	$ 144,216	$ 336,700	$ 274,139	0.2559	0.5974	0.4864
CRUM & FORSTER GRP	$ 209,312,850	$ 156,521,825	$ 228,521,618	$ -19,168,537	0.7478	1.0918	-0.0916
EAGLE STAR INS CO LTD	$ 787,985	$ 517,663	$ 868,641	$ -17,726	0.6569	1.1024	-0.0225
EMPLOYERS CAS CO	$ 16,413,209	$ 10,525,374	$ 16,097,428	$ 1,064,957	0.6413	0.9808	0.0649
EXCELSIOR INS CO OF NY	$ 430,036	$ 229,781	$ 418,521	$ 7,366	0.5343	1.0197	0.0171
FARMERS & MERCHANTS INS CO	$ 717,841	$ 459,577	$ 741,825	$ -14,916	0.6402	1.0334	-0.0208
FEDERAL INS CO	$ 34,325,856	$ 27,044,504	$ 39,817,943	$ -3,312,331	0.78[illegible]	1.1600	-0.0965

* Includes Dividends

/ Net Earned Premium Less Losses, expense, dividends and investment income related to net earned premium.

From Insurance Expense Exhibits

OPERATING RESULTS FOR CALENDAR YEAR 1975 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM #
FIREMAN'S FUND/AMERICAN	$ 237,464,228	$ 158,188,388	$ 239,877,621	$ 11,519,771	0.6662	1.0102	0.0485
FIRST INS CO OF HAWAII	$ 6,261,548	$ 5,101,970	$ 6,771,427	$ -63,510	0.8148	1.0814	-0.0101
FORUM INS CO	$ 570,749	$ 513,339	$ 685,838	$ -103,024	0.8994	1.2016	-0.1805
GENERAL ACCIDENT GRP	$ 32,512,974	$ 21,805,850	$ 37,107,606	$ -2,053,724	0.7322	1.1413	-0.0632
GEN CAS CO OF WISC	$ 3,563,962	$ 1,891,392	$ 2,942,697	$ 864,590	0.5307	0.8257	0.2426
GEN FIRE & CAS CO	$ 2,311,425	$ 1,484,038	$ 2,082,664	$ 367,108	0.6420	0.9010	0.1588
GEN INS OF TRIESTE & VENICE	$ 19,317	$ -13,879	$ -8,090	$ 32,545	-0.7185	-0.4188	1.6848
GREAT AMER INS COS	$ 78,946,706	$ 57,908,932	$ 84,117,457	$ 1,402,565	0.7335	1.0655	0.0178
GREAT NORTHERN INS CO	$ 2,384,742	$ 1,944,701	$ 2,863,112	$ -345,203	0.8155	1.2006	-0.1448
GULF INS GRP	$ 17,900,244	$ 18,699,798	$ 25,572,466	$ -6,656,070	1.0447	1.4286	-0.3718
HANOVER INS GRP	$ 15,951,113	$ 12,471,505	$ 19,248,684	$ -1,900,366	0.7819	1.2067	-0.1191
HARBOR INS GRP	$ 675,396	$ 1,172,658	$ 1,369,781	$ -571,422	1.7363	2.0281	-0.8461
HARTFORD INS GRP	$ 271,501,858	$ 210,450,701	$ 312,987,838	$ -21,408,185	0.7751	1.1528	-0.0789
HAWAIIAN INS & GUAR CO LTD	$ 4,663,703	$ 2,158,986	$ 3,854,636	$ 1,090,834	0.4629	0.8265	0.2339
HIGHLANDS INS GRP	$ 45,388,775	$ 36,851,554	$ 46,165,604	$ 1,859,125	0.8119	1.0171	0.0410
HOME GRP	$ 159,757,680	$ 102,731,840	$ 150,677,969	$ 18,409,073	0.6430	0.9432	0.1152
ILLINOIS INS CO	$ 172,184	$ 102,498	$ 197,935	$ -19,831	0.5953	1.1496	-0.1152
INS CO OF GREATER NY	$ 1,442,130	$ 722,986	$ 1,410,928	$ 84,830	0.5013	0.9784	0.0588
INS CO OF NORTH AMERICA	$ 101,577,327	$ 76,139,144	$ 109,089,191	$ 4,319,541	0.7496	1.0740	0.0425
INTERSTATE FIRE & CAS CO	$ 53,392	$ 162,959	$ 424,823	$ -371,431	6.7980	7.9567	-6.9567
ISLAND INS CO LTD	$ 1,020,268	$ 522,405	$ 1,027,718	$ 94,639	0.5120	1.0073	0.0928
LIBERTY ASSURANCE CO	$ 2,818,136	$ 2,314,726	$ 3,370,941	$ -366,945	0.8214	1.1962	-0.1302
MID-CONTINENT CAS CO	$ 5,114,717	$ 4,438,580	$ 5,730,444	$ -467,865	0.8678	1.1204	-0.0915
MIDLAND INS CO	$ 7,717,144	$ 8,041,530	$ 9,849,772	$ -1,406,608	1.0420	1.2763	-0.1823
MISSION INS CO^	$ 40,515,046	$ 28,414,295	$ 40,942,654	$ 679,386	0.7013	1.0106	0.0168

* Includes Dividends

\# Net Earned Premium Less Losses, expenses, dividends and investment income related to net earned premium.

Data from Insurance Expense Exhibits

APPENDIX F1

OPERATING RESULTS FOR CALENDAR YEAR 1975 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM #
MONARCH INS CO OF OHIO	$ 291,293	$ 124,622	$ 319,381	$ -10,381	0.4278	1.0964	-0.0356
MOTOR VEHICLE CAS CO	$ 547,120	$ 288,366	$ 510,287	$ 97,692	0.5271	0.9327	0.1786
NATIONAL INDEM COS	$ 5,065,452	$ 3,663,127	$ 5,410,369	$ -26,520	0.7232	1.0681	-0.0052
NETHERLANDS INS CO	$ 645,407	$ 375,822	$ 647,373	$ 42,668	0.5823	1.0030	0.0661
NEW HAMPSHIRE INS COS	$ 32,547,404	$ 21,492,628	$ 32,459,872	$ 1,578,595	0.6603	0.9973	0.0485
OHIO CAS INS CO	$ 13,792,922	$ 8,718,615	$ 13,878,834	$ 614,492	0.6321	1.0063	0.0446
PATRIOT GEN INS CO	$ 185,825	$ 45,511	$ 179,362	$ 53,035	0.2449	0.9652	0.2854
PEKIN INS CO	$ 265,582	$ 119,425	$ 207,023	$ 71,183	0.4497	0.7795	0.2680
PHOENIX OF LONDON GRP	$ 15,519,265	$ 13,624,782	$ 18,766,611	$ -2,248,816	0.8779	1.2092	-0.1449
PROTECTIVE FIRE & CAS CO	$ -897	$ -172	$ 46,506	$ -46,525	0.1918	-51.8462	51.8673
PROTECTIVE INS CO	$ 1,783,547	$ 2,276,368	$ 2,882,784	$ -962,749	1.2763	1.6163	-0.5398
PROVIDENCE WASH INS CO	$ 11,797,671	$ 7,381,551	$ 11,343,900	$ 807,144	0.6257	0.9615	0.0684
RANGER/FAM AMER INS COS	$ 7,283,961	$ 5,073,055	$ 7,352,222	$ 72>,289	0.6965	1.0094	0.0996
RELIANCE INS COS	$ 66,624,148	$ 51,723,455	$ 78,196,351	$ -8,577,241	0.7763	1.1737	-0.0987
REPUBLIC-VANGUARD GRP	$ 9,352	$ 7,483	$ 13,274	$ -3,687	0.8001	1.4194	-0.3942
RESERVE INS CO	$ 2,820,131	$ 1,772,977	$ 1,858,010	$ 1,039,505	0.6287	0.6588	0.3686
ROYAL-GLOBE INS COS	$ 114,199,099	$ 87,451,391	$ 123,361,076	$ 2,026,831	0.7658	1.0802	0.0177
ST. PAUL INS COS	$ 77,849,431	$ 55,394,462	$ 81,372,146	$ 2,418,801	0.7116	1.0453	0.0311
SEA INS CO LTD	$ 1,953,881	$ 1,612,942	$ 2,354,347	$ -290,258	0.8255	1.2050	-0.1486
SECURITY INS GRP	$ 17,931,536	$ 13,756,264	$ 20,459,251	$ -1,032,155	0.7672	1.1410	-0.0576
SOUTH CAROLINA INS CO	$ 3,052,755	$ 1,933,967	$ 3,106,781	$ 9,577	0.6335	1.0177	0.0031
SOUTHERN HOME INS CO	$ 81,199	$ 7,854	$ 17,898	$ 63,334	0.0967	0.2204	0.7800
STATE FARM FIRE & CAS CO	$ 15,612,796	$ 9,104,177	$ 14,565,556	$ 1,984,452	0.5831	0.9316	0.1271
SUN INS OFFICE LTD	$ 3,236,567	$ 2,671,030	$ 3,972,406	$ -528,375	0.8253	1.2274	-0.1633
TOWER INS CO	$ 816,112	$ 268,698	$ 647,219	$ 221,673	0.3292	0.7931	0.2716

* Includes Dividends

\# Net Earned Premium Less
Losses, expenses, dividends and investment income related to net earned premium.

Data from Insurance Expense Exhibits

OPERATING RESULTS FOR CALENDAR YEAR 1974 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES *	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM//
AETNA CAS & SUR GRP	$ 222,798,590	$ 171,421,442	$ 252,329,461	$ -9,233,030	0.7694	1.1325	-0.0414
AETNA INS GRP	$ 51,436,272	$ 37,039,261	$ 56,078,187	$ -2,003,881	0.7201	1.0902	-0.0390
AGWAY INS GRP	$ 68,057	$ 7,419	$ 48,567	$ 22,634	0.1090	0.7136	0.3326
ALL STAR INS CO	$ 16,464	$ 10,260	$ 13,775	$ 4,080	0.6232	0.8367	0.2478
ALL CITY INS CO	$ 1,184,502	$ 553,904	$ 1,327,830	$ -32,972	0.4676	1.1210	-0.0278
ALLIANCE INS CO LTD	$ 1,758,942	$ 1,376,046	$ 2,001,367	$ -163,405	0.7823	1.1390	-0.0929
AMER HOME & MFG. UNION GRPS	$ 7,269,833	$ 5,432,232	$ 9,694,397	$ -1,900,736	0.7472	1.3335	-0.2615
AMER STATES INS CO	$ 14,432,794	$ 11,839,886	$ 17,497,835	$ -2,446,778	0.8203	1.2124	-0.1695
AMER UNIVERSAL INS CO	$ 1,473,929	$ 1,076,405	$ 1,717,596	$ -163,289	0.7301	1.1653	-0.1108
BITUMINOUS CAS CORP	$ 45,177,318	$ 33,709,720	$ 50,962,549	$ -2,879,594	0.7462	1.1281	-0.0637
CASUALTY INS CO	$ 3,880,821	$ 2,570,372	$ 4,081,495	$ -57,487	0.6623	1.0517	-0.0148
CENTENNIAL INS CO	$ 4,450,736	$ 3,195,488	$ 5,244,784	$ -558,243	0.7180	1.1784	-0.1254
CHICAGO INS CO	$ 221,896	$ 225,226	$ 309,818	$ -87,289	1.0150	1.3962	-0.3934
CHRONIC UNION ASSN CAS	$ 122,713,021	$ 82,262,712	$ 126,388,946	$ 3,805,277	0.6704	1.0300	0.0310
COMPANION INS CO	$ 8,926	$ 6,516	$ 12,114	$ -2,731	0.7300	1.3572	-0.3060
CONTINENTAL INS CO	$ 181,368,643	$ 161,548,047	$ 224,066,239	$ -37,570,984	0.8907	1.2354	-0.2072
CNA GRP	$ 173,297,060	$ 143,601,352	$ 200,148,755	$ -14,137,965	0.8286	1.1549	-0.0816
COVENANT INS CO	$ 433,000	$ 271,042	$ 423,053	$ -5,187	0.6260	0.9770	-0.0120
CRUM & FORSTER GRP	$ 61,892,852	$ 40,311,228	$ 62,247,053	$ -354,201	0.6513	1.0057	-0.0057
EAGLE STAR INS CO LTD	$ 527,673	$ 349,054	$ 601,347	$ -30,618	0.6615	1.1396	-0.0580
EMPLOYERS CAS CO	$ 12,240,852	$ 8,028,499	$ 12,543,737	$ 25,554	0.6559	1.0247	0.0021
EXCELSIOR INS CO OF NY	$ 314,539	$ 158,401	$ 286,280	$ 45,581	0.5036	0.9102	0.1449
FARMERS & MERCHANTS INS CO	$ 650,278	$ 409,349	$ 684,566	$ -27,666	0.6295	1.0527	-0.0425
FEDERAL INS CO	$ 33,884,473	$ 26,988,292	$ 40,612,934	$ -5,342,461	0.7965	1.1986	-0.1577
FIREMAN'S FUND/AMERICAN	$ 182,092,145	$ 119,110,898	$ 194,707,210	$ -318,142	0.6541	1.0693	-0.0017

* Includes Dividends

// Net Earned Premium Less Losses, expenses, dividends and investment income related to net earned premium.

Data from Insurance Expenses Exhibits

OPERATING RESULTS FOR CALENDAR YEAR 1974 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM #
FIRST INS CO OF HAWAII	$ 4,745,589	$ 3,588,432	$ 4,966,525	$ 187,191	0.7562	1.0466	0.0394
FORUM INS CO	$ 409,761	$ 194,625	$ 355,901	$ 66,665	0.4750	0.8686	0.1627
GENERAL ACCIDENT GRP	$ 30,036,309	$ 19,215,774	$ 31,308,805	$ 664,319	0.6398	1.0424	0.0221
GEN CAS CO OF WISC	$ 2,939,132	$ 1,501,601	$ 2,435,951	$ 640,954	0.5109	0.8288	0.2181
GEN FIRE & CAS CO	$ 2,371,513	$ 1,090,241	$ 1,653,421	$ 915,601	0.4597	0.6972	0.3861
GEN INS CO OF TRIESTE & VENIC	$ 47,274	$ -1,005	$ 20,626	$ 30,532	-0.0213	0.4363	0.6459
GREAT AMER INS GRP	$ 57,265,041	$ 36,224,188	$ 54,336,013	$ 7,197,770	0.6326	0.9489	0.1292
GREAT NORTHERN INS CO	$ 2,063,620	$ 1,599,850	$ 2,436,687	$ -302,067	0.7753	1.1808	-0.1464
GULF INS GRP	$ 18,178,817	$ 14,577,975	$ 20,708,259	$ -1,675,467	0.8019	1.1392	-0.0922
HANOVER INS GRP	$ 13,209,351	$ 7,981,669	$ 13,113,317	$ 96,625	0.6042	0.9927	0.0073
HARBOR INS GRP	$ 979,162	$ 394,836	$ 543,820	$ 511,234	0.4032	0.5554	0.5221
HARTFORD INS GRP	$ 299,618,575	$ 213,241,594	$ 320,298,851	$ -1,269,851	0.7117	1.0690	-0.0042
HAWAIIAN INS & GUAR CO LTD	$ 2,516,917	$ 2,401,007	$ 3,527,805	$ -837,458	0.9539	1.4016	-0.3327
HIGHLANDS INS CO	$ 49,037,510	$ 38,418,698	$ 51,389,524	$ 99,090	0.7835	1.0480	0.0020
HOME GRP	$ 122,719,386	$ 84,674,310	$ 125,386,260	$ 1,406,333	0.6900	1.0217	0.0115
ILLINOIS INS GRP	$ 130,716	$ 103,973	$ 188,647	$ -52,930	0.7954	1.4432	-0.4049
INS CO OF GREATER NY	$ 1,417,712	$ 577,811	$ 1,209,805	$ 307,492	0.4076	0.8534	0.2169
INS CO OF NORTH AMERICA	$ 83,184,507	$ 71,367,606	$ 104,356,727	$ -12,195,096	0.8579	1.2545	-0.1466
INTERSTATE FIRE & CAS CO	$ 665,689	$ 675,684	$ 929,459	$ -261,870	1.0150	1.3962	-0.1934
INTERSTATE INS CO	$ 2,803	$ 815	$ 2,586	$ 217	0.2908	0.9226	0.0774
ISLAND INS CO LTD	$ 890,281	$ 886,477	$ 1,205,070	$ -273,092	0.9960	1.3536	-0.3067
LONDON ASSURANCE CO	$ 2,613,359	$ 2,037,437	$ 3,032,327	$ -314,968	0.7796	1.1603	-0.1205
MARYLAND AMER GEN INS CO	$ 63,731,860	$ 45,052,705	$ 67,152,454	$ -526,754	0.7069	1.0537	-0.0083
MID-CONTINENT CAS CO	$ 4,284,548	$ 3,282,676	$ 4,311,140	$ 85,826	0.7662	1.0062	0.0200
MIDLAND INS CO	$ 9,941,016	$ 6,944,417	$ 8,299,267	$ 2,111,462	0.6986	0.8349	0.2124

* Includes Dividends

\# Net Earned Premium Less Losses, expenses, dividends and investm. Income related to net earned premium.

Data from Insurance Expenses Exhibits

OPERATING RESULTS FOR CALENDAR YEAR 1974 (S)INO NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM #
MISSION INS CO	$ 28,950,324	$ 17,985,574	$ 25,766,721	$ 4,221,418	0.6213	0.8900	0.1458
NEWARK INS CO OF OHIO	$ 122,284	$ 126,228	$ 173,668	$ -21,718	1.0323	1.4202	-0.1776
MOTOR VEHICLE CAS CO	$ 551,905	$ 309,086	$ 509,807	$ 100,282	0.5600	0.9237	0.1817
NATIONAL INDEM COS	$ 4,723,027	$ 3,292,656	$ 4,830,904	$ 93,058	0.6971	1.0228	0.0197
NETHERLANDS INS CO	$ 517,174	$ 262,492	$ 489,877	$ 53,550	0.5076	0.9472	0.1035
NEW HAMPSHIRE INS CO	$ 21,734,695	$ 13,868,774	$ 21,680,258	$ 635,683	0.6381	0.9975	0.0292
OHIO CAS INS CO	$ 13,358,749	$ 6,498,705	$ 11,065,886	$ 2,678,556	0.4865	0.8284	0.2005
PATRIOT GEN INS CO	$ 378,515	$ 383,571	$ 508,906	$ -142,793	1.0134	1.3445	-0.3772
PEKIN INS CO	$ 204,434	$ 150,315	$ 229,061	$ -13,755	0.7353	1.1205	-0.0673
PHOENIX OF LONDON GRP	$ 11,625,761	$ 10,354,854	$ 14,427,453	$ -2,231,392	0.8907	1.2410	-0.1919
PROTECTIVE FIRE & CAS CO	$ 7,526	$ -3,417	$ 49,308	$ -41,188	-0.4540	6.5517	-5.4728
PROTECTIVE INS CO	$ 1,027,634	$ 878,461	$ 1,192,820	$ -84,357	0.8548	1.1607	-0.0821
PROVIDENCE WASH INS CO	$ 7,211,581	$ 4,789,875	$ 7,457,390	$ 45,736	0.6642	1.0341	0.0063
PRUDENTIAL PROP & CAS CO	$ 1,497	$ 17,570	$ 20,413	$ -13,471	11.7368	13.6359	-8.9987
RANGER-PAN AMERICAN GRP	$ 8,667,458	$ 8,924,310	$ 12,290,554	$ -3,124,984	1.0296	1.4180	-0.3605
RELIANCE INS COS	$ 59,685,313	$ 39,207,668	$ 63,437,215	$ -3,031,312	0.6569	1.0629	-0.0508
REPUBLIC-VANGUARD GRP	$ 6,939	$ 9,442	$ 12,392	$ -5,237	1.3607	1.7858	-0.7547
RESERVE INS GRP	$ 1,449,756	$ 1,334,566	$ 1,663,657	$ -228,720	0.9205	1.1475	-0.1578
ROYAL-GLOBE INS CO	$ 113,335,763	$ 92,229,023	$ 126,907,198	$ -5,048,185	0.8135	1.1194	-0.0445
ST PAUL INS CO	$ 68,175,982	$ 48,282,901	$ 72,686,438	$ -587,902	0.7082	1.0662	-0.0086
SEA INS CO LTD	$ 1,721,619	$ 1,348,049	$ 1,977,697	$ -180,078	0.7831	1.1474	-0.1045
SECURITY INS GRP	$ 15,420,490	$ 11,184,073	$ 17,240,279	$ -1,416,097	0.7253	1.1180	-0.0918
SOUTH CAROLINA INS CO	$ 2,573,086	$ 1,573,276	$ 2,526,758	$ 146,716	0.6114	0.9820	0.0570
SOUTHERN HOME INS CO	$ 81,943	$ 43,024	$ 78,550	$ 5,207	0.5250	0.9586	0.0635
STATE FARM FIRE & CAS	$ 11,986,359	$ 8,103,308	$ 12,427,623	$ 148,496	0.6760	1.0368	0.0124

* Includes Dividends

Data from Insurance Expenses Exhibits

\# Net Earned Premium Less
Losses, expenses, dividends and investment income related to net earned premium.

OPERATING RESULTS FOR CALENDAR YEAR 1974 USING NET PREMIUMS

CARRIER	NET EARNED PREMIUM	INCURRED LOSSES	LOSSES+ EXPENSES*	NET INCOME	LOSS RATIO	OPERATING RATIO	RATIO OF NET INCOME TO PREMIUM#
SUN INS OFFICE LTD	$ 2,501,404	$ 1,958,771	$ 2,980,745	$ -347,341	0.7831	1.1916	-0.1389
TOWER INS CO	$ 427,903	$ 315,343	$ 452,286	$ 2,003	0.7369	1.0570	0.0047
TRANS AMERICA INS CO	$ 20,122,319	$ 12,614,675	$ 22,048,961	$ -977,010	0.6269	1.0957	-0.0486
TRAVELERS INDEM OF ILL	$ 3,005,981	$ 2,495,048	$ 3,239,123	$ -90,392	0.8300	1.0776	-0.0301
TRAVELERS INS C.	$ 78,393,930	$ 57,456,853	$ 85,358,838	$ 1,772,570	0.7329	1.0888	0.0226
TRINITY UNIVERSAL INS CO	$ 4,894,985	$ 3,556,761	$ 5,051,843	$ 95,374	0.7266	1.0320	0.0195
TRI-STATE INS CO	$ 3,251,393	$ 2,046,746	$ 3,420,592	$ -85,976	0.6295	1.0520	-0.0264
UNIGARD INS CO	$ 183,573	$ 139,618	$ 231,383	$ -43,021	0.7606	1.2604	-0.2344
UNITED FIRE & CAS	$ 813,144	$ 332,273	$ 607,380	$ 251,042	0.4086	0.7470	0.3088
U S FIDELITY & GUAR CO	$ 146,453,317	$ 104,770,275	$ 152,114,650	$ 967,178	0.7154	1.0387	0.0066
VERNON FIRE & CAS CO	$ 192,151	$ 137,765	$ 214,848	$ -9,826	0.7170	1.1181	-0.0511
VIGILANT INS CO	$ 4,936,121	$ 3,917,792	$ 5,883,974	$ -765,853	0.7937	1.1920	-0.1552
WESTERN CAS & SUR CO	$ 18,241,889	$ 11,612,284	$ 17,943,488	$ 535,574	0.6366	0.9836	0.0294
WESTFIELD COS	$ 1,843,476	$ 783,774	$ 1,716,891	$ 35,998	0.4252	0.9313	0.0195
WOLVERINE INS CO	$ 2,486,510	$ 1,513,159	$ 2,386,349	$ 211,494	0.6085	0.9597	0.0851
ZURICH-AMERICAN INS CO	$ 36,968,484	$ 32,384,635	$ 47,706,463	$ -7,972,189	0.8760	1.2905	-0.2156
TOTALS	$ 2,594,892,280	$ 1,914,726,983	$ 2,838,210,469	$ -91,064,637			
MEANS	xxx	xxx	xxx	xxx	0.7379	1.0938	-0.0351
STANDARD DEVIATIONS	xxx	xxx	xxx	xxx	0.0841	0.0887	0.0858

M:GAC-3/23/78

*Includes Dividends

Data from Insurance Expenses Exhibits

#Net Earned Premium Less
Losses, expenses, dividends and investment income related to net earned premium.

LOSS RATIO DISTRIBUTION
BASED ON CALENDAR YEAR 1976 USING STANDARD PREMIUM
STOCK AND MUTUAL COMPANIES

(1) RATIO TO AVERAGE	(2) LOSS RATIO	(3) NO. OF COS. AT LOSS RATIO INTERVAL	(4) % OF COS. AT LOSS RATIO INTERVAL	(5) % OF COS. AT OR ABOVE INTERVAL	(6) PREMIUM AT LOSS RATIO INTERVAL	(7) % OF PREMIUM AT LOSS RATIO INTERVAL	(8) % OF PREMIUM AT OR ABOVE INTERVAL
0.00	0.000	2	0.7905	100.0000	9,941	0.0001	100.0000
0.05	0.037	1	0.3953	99.2095	3,064	0.0000	99.9999
0.10	0.074	2	0.7905	98.8142	212,354	0.0030	99.9998
0.15	0.110	1	0.3953	98.0237	614,104	0.0086	99.9968
0.20	0.147	0	0.0000	97.6285	0	0.0000	99.9882
0.25	0.184	0	0.0000	97.6285	0	0.0000	99.9882
0.30	0.221	1	0.3953	97.6285	974,847	0.0137	99.9882
0.35	0.258	1	0.3953	97.2332	1,310,645	0.0184	99.9745
0.40	0.294	2	0.7905	96.8379	710,294	0.0100	99.9561
0.45	0.331	0	0.0000	96.0474	0	0.0000	99.9461
0.50	0.368	3	1.1858	96.0474	2,735,736	0.0384	99.9461
0.55	0.405	7	2.7668	94.8617	19,749,661	0.2776	99.9077
0.60	0.442	10	3.9526	92.0949	22,187,159	0.3118	99.6301
0.65	0.478	7	2.7668	88.1423	91,768,588	1.2897	99.3183
0.70	0.515	15	5.9289	85.3755	176,018,432	2.4738	98.0285
0.75	0.552	20	7.9051	79.4466	106,511,480	1.4969	95.5548
0.80	0.589	17	6.7194	71.5415	208,918,858	2.9362	94.0578
0.85	0.626	34	13.4387	64.8221	618,276,596	8.6893	91.1217
0.90	0.662	24	9.4862	51.3834	1,926,558,254	27.0761	82.4323
0.95	0.699	25	9.8814	41.8972	928,035,400	13.0427	55.3562
1.00	0.736	19	7.5099	32.0158	865,413,821	12.1626	42.3135
1.05	0.773	17	6.7194	24.5059	532,678,292	7.4863	30.1509
1.10	0.810	7	2.7668	17.7866	257,899,353	3.6245	22.6645
1.15	0.846	9	3.5573	15.0198	750,568,731	10.5486	19.0400
1.20	0.883	5	1.9763	11.4625	192,898,775	2.7110	8.4914
1.25	0.920	5	1.9763	9.4862	318,837,160	4.4810	5.7804
1.30	0.957	2	0.7905	7.5099	68,697,457	0.9655	1.2994
1.35	0.994	0	0.0000	6.7194	0	0.0000	0.3339
1.40	1.030	0	0.0000	6.7194	0	0.0000	0.3339
1.45	1.067	2	0.7905	6.7194	4,281,768	0.0602	0.3339
1.50	1.104	1	0.3953	5.9289	3,356,649	0.0472	0.2737
1.55	1.141	4	1.5810	5.5336	7,292,578	0.1025	0.2266
1.60	1.178	0	0.0000	3.9526	0	0.0000	0.1241
1.65	1.214	0	0.0000	3.9526	0	0.0000	0.1241
1.70	1.251	0	0.0000	3.9526	0	0.0000	0.1241
1.75	1.288	2	0.7905	3.9526	430,195	0.0060	0.1241
1.80	1.325	0	0.0000	3.1621	0	0.0000	0.1130
1.85	1.362	1	0.3953	3.1621	7,104,315	0.0998	0.1180
1.90	1.398	0	0.0000	2.7668	0	0.0000	0.0182
1.95	1.435	1	0.3953	2.7668	835,576	0.0117	0.0182

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LOSS RATIO DISTRIBUTION
BASED ON CALENDAR YEAR 1976 USING STANDARD PREMIUM
STOCK AND MUTUAL COMPANIES

(1) RATIO TO AVERAGE	(2) LOSS RATIO	(3) NO. OF COS. AT LOSS RATIO INTERVAL	(4) % OF COS. AT LOSS RATIO INTERVAL	(5) % OF COS. AT OR ABOVE INTERVAL	(6) PREMIUM AT LOSS RATIO INTERVAL	(7) % OF PREMIUM AT LOSS RATIO INTERVAL	(8) % OF PREMIUM AT OR ABOVE INTERVAL
2.00	1.472	2	0.7905	2.3715	15,850	0.0002	0.0064
2.05	1.509	0	0.0000	1.5810	0	0.0000	0.0062
2.10	1.545	0	0.0000	1.5810	0	0.0000	0.0062
2.15	1.582	0	0.0000	1.5810	0	0.0000	0.0062
2.20	1.619	0	0.0000	1.5810	0	0.0000	0.0062
2.25	1.656	0	0.0000	1.5810	0	0.0000	0.0062
2.30	1.693	0	0.0000	1.5810	0	0.0000	0.0062
2.35	1.729	0	0.0000	1.5810	0	0.0000	0.0062
2.40	1.766	0	0.0000	1.5810	0	0.0000	0.0062
2.45	1.803	0	0.0000	1.5810	0	0.0000	0.0062
2.50	1.840	0	0.0000	1.5810	0	0.0000	0.0062
2.55	1.877	0	0.0000	1.5810	0	0.0000	0.0062
2.60	1.913	0	0.0000	1.5810	0	0.0000	0.0062
2.65	1.950	0	0.0000	1.5810	0	0.0000	0.0062
2.70	1.987	0	0.0000	1.5810	0	0.0000	0.0062
2.75	2.024	0	0.0000	1.5810	0	0.0000	0.0062
2.80	2.061	0	0.0000	1.5810	0	0.0000	0.0062
2.85	2.097	0	0.0000	1.5810	0	0.0000	0.0062
2.90	2.134	0	0.0000	1.5810	0	0.0000	0.0062
2.95	2.171	0	0.0000	1.5810	0	0.0000	0.0062
3.00	2.208	0	0.0000	1.5810	0	0.0000	0.0062
3.05	2.245	1	0.3953	1.5810	50,082	0.0007	0.0062
3.10	2.281	0	0.0000	1.1858	0	0.0000	0.0055
3.15	2.318	0	0.0000	1.1858	0	0.0000	0.0055
3.20	2.355	0	0.0000	1.1858	0	0.0000	0.0055
3.25	2.392	0	0.0000	1.1858	0	0.0000	0.0055
3.30	2.429	1	0.3953	1.1858	159,583	0.0022	0.0055
3.35	2.465	0	0.0000	0.7905	0	0.0000	0.0033
3.40	2.502	0	0.0000	0.7905	0	0.0000	0.0033
3.45	2.539	0	0.0000	0.7905	0	0.0000	0.0033
3.50	2.576	0	0.0000	0.7905	0	0.0000	0.0033
3.55	2.613	0	0.0000	0.7905	0	0.0000	0.0033
3.60	2.649	0	0.0000	0.7905	0	0.0000	0.0033
3.65	2.686	0	0.0000	0.7905	0	0.0000	0.0033
3.70	2.723	0	0.0000	0.7905	0	0.0000	0.0033
3.75	2.760	0	0.0000	0.7905	0	0.0000	0.0033
3.80	2.797	0	0.0000	0.7905	0	0.0000	0.0033
3.85	2.833	0	0.0000	0.7905	0	0.0000	0.0033
3.90	2.870	0	0.0000	0.7905	0	0.0000	0.0033
3.95	2.907	0	0.0000	0.7905	0	0.0000	0.0033

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LOSS RATIO DISTRIBUTION
BASED ON CALENDAR YEAR 1976 USING STANDARD PREMIUM
STOCK AND MUTUAL COMPANIES

(1) RATIO TO AVERAGE	(2) LOSS RATIO	(3) NO. OF COS. AT LOSS RATIO INTERVAL	(4) % OF COS. AT LOSS RATIO INTERVAL	(5) % OF COS. AT OR ABOVE INTERVAL	(6) PREMIUM AT LOSS RATIO INTERVAL	(7) % OF PREMIUM AT LOSS RATIO INTERVAL	(8) % OF PREMIUM AT OR ABOVE INTERVAL
4.00	2.944	0	0.0000	0.7905	0	0.0000	0.0033
4.05	2.981	0	0.0000	0.7905	0	0.0000	0.0033
4.10	3.017	0	0.0000	0.7905	0	0.0000	0.0033
4.15	3.054	0	0.0000	0.7905	0	0.0000	0.0033
4.20	3.091	1	0.3953	0.7905	24,854	0.0003	0.0033
4.25	3.128	0	0.0000	0.3953	0	0.0000	0.0029
4.30	3.165	0	0.0000	0.3953	0	0.0000	0.0029
4.35	3.201	0	0.0000	0.3953	0	0.0000	0.0029
4.40	3.238	0	0.0000	0.3953	0	0.0000	0.0029
4.45	3.275	0	0.0000	0.3953	0	0.0000	0.0029
4.50	3.312	0	0.0000	0.3953	0	0.0000	0.0029
4.55	3.349	0	0.0000	0.3953	0	0.0000	0.0029
4.60	3.385	0	0.0000	0.3953	0	0.0000	0.0029
4.65	3.422	0	0.0000	0.3953	0	0.0000	0.0029
4.70	3.459	0	0.0000	0.3953	0	0.0000	0.0029
4.75	3.496	0	0.0000	0.3953	0	0.0000	0.0029
4.80	3.533	0	0.0000	0.3953	0	0.0000	0.0029
4.85	3.569	0	0.0000	0.3953	0	0.0000	0.0029
4.90	3.606	0	0.0000	0.3953	0	0.0000	0.0029
4.95	3.643	0	0.0000	0.3953	0	0.0000	0.0029
5.00	3.680	0	0.0000	0.3953	0	0.0000	0.0029
5.05	3.717	0	0.0000	0.3953	0	0.0000	0.0029
5.10	3.753	0	0.0000	0.3953	0	0.0000	0.0029
5.15	3.790	0	0.0000	0.3953	0	0.0000	0.0029
5.20	3.827	0	0.0000	0.3953	0	0.0000	0.0029
5.25	3.864	0	0.0000	0.3953	0	0.0000	0.0029
5.30	3.901	0	0.0000	0.3953	0	0.0000	0.0029
5.35	3.937	0	0.0000	0.3953	0	0.0000	0.0029
5.40	3.974	0	0.0000	0.3953	0	0.0000	0.0029
5.45	4.011	0	0.0000	0.3953	0	0.0000	0.0029
5.50	4.048	0	0.0000	0.3953	0	0.0000	0.0029
5.55	4.085	0	0.0000	0.3953	0	0.0000	0.0029
5.60	4.121	0	0.0000	0.3953	0	0.0000	0.0029
5.65	4.158	0	0.0000	0.3953	0	0.0000	0.0029
5.70	4.195	0	0.0000	0.3953	0	0.0000	0.0029
5.75	4.232	0	0.0000	0.3953	0	0.0000	0.0029
5.80	4.269	0	0.0000	0.3953	0	0.0000	0.0029
5.85	4.305	0	0.0000	0.3953	0	0.0000	0.0029
5.90	4.342	0	0.0000	0.3953	0	0.0000	0.0029
5.95	4.379	0	0.0000	0.3953	0	0.0000	0.0029

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LOSS RATIO DISTRIBUTION
BASED ON CALENDAR YEAR 1976 USING STANDARD PREMIUM
STOCK AND MUTUAL COMPANIES

(1) RATIO TO AVERAGE	(2) LOSS RATIO	(3) NO. OF COS. AT LOSS RATIO INTERVAL	(4) % OF COS. AT LOSS RATIO INTERVAL	(5) % OF COS. AT OR ABOVE INTERVAL	(6) PREMIUM AT LOSS RATIO INTERVAL	(7) % OF PREMIUM AT LOSS RATIO INTERVAL	(8) % OF PREMIUM AT OR ABOVE INTERVAL
6.00	4.416	0	0.0000	0.3953	0	0.0000	0.0029
6.05	4.453	0	0.0000	0.3953	0	0.0000	0.0029
6.10	4.489	0	0.0000	0.3953	0	0.0000	0.0029
6.15	4.526	0	0.0000	0.3953	0	0.0000	0.0029
6.20	4.563	0	0.0000	0.3953	0	0.0000	0.0029
6.25	4.600	1	0.3953	0.3953	208,013	0.0029	0.0029

MEAN: 0.7360
STANDARD DEVIATION: 0.1071

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APPENDIX H

ANALYSIS OF WORKERS' COMPENSATION IBNR RESERVES

Incurred but not reported loss reserves are shown in Schedule P on a countrywide basis. Such reserves are not available on a statewide basis.

For purposes of evaluating the movement of IBNR reserves and the amounts reserved for such cases, a study of 86 companies (25 largest groups according to Best's Executive Data Service) representing approximately two-thirds of all stock and mutual insurance company experience was summarized and reviewed. The basic data ar shown in Exhibit I and contain calendar year earned premiums, accident year incurred but not reported (IBNR) losses unpaid at December 31, 1976 and amount of IBNR developed during 1976 by accident year. The premiums in column (B) were taken from Schedule P, part 1D - workers' compensation. The IBNR amounts in columns (C) and (D) were taken from Schedule P, columns (5) and (10) of part 1F. The information was obtained from Best's Reproductions of Convention Statements.

Columns (E) through (I) formulate the data into an analysis of the emergence of IBNR losses and compare the results with the companies' estimated IBNR loss reserve amounts at December 31, 1976. The underlying basis for the analysis is that the amount of IBNR losses is a function of the maturity of the particular accident year. Also, the best available measure of exposure to loss is the earned premium for the particular year. Accordingly, each year's reported development of IBNR losses has been measured against premiums earned. For example, during 1976, $3,773,288 of reported IBNR losses developed on accident year 1969; this represented .001736 of 1969 earned premium. Similar computations were made for later accident years and are shown in column (E). With respect to accident years prior to 1969, it was felt appropriate to use 1969 premiums earned as the measure of exposure to loss.

On accident years prior to 1969, the companies' actual estimates of unpaid IBNR losses at December 31,1976 were used to ascertain the appropriate ratio to earned premiums to measure future IBNR loss liabilities. The ratio which represents the emergence of IBNR losses during the year were accumulated to provide an estimate of IBNR loss reserves needed on or after December 31, 1976 for the accident year. For example, for line 2 of column (G), there would be needed $15,354,427; this is equal to .004320 plus .002745 or .007065 in column (F) applied to $2,173,308,898 in column (B) to cover future IBNR claims on accident year 1969. For accident year 1970, .007065 + .001736 or .008801 of $2,354,426,741 would be needed for future IBNR claims.

Column (H) compares the estimates derived as described above with the estimates made by the companies in column (C). The comparision shows a deficiency ratio of .079908 (column (I), line 10) of one year's premium. In other words, the companies appear to still be under-reserved to the extent of almost 8% of premium. Therefore, the argument that calendar year experience represents the result of substantial strengthening of reserves or possible over-reserving is not a proper one. Additionally, it should be observed that one might reasonably expect further adverse developments to emerge and, therefore, observed loss developments for the years 1976 and prior probably represent a conservative estimate of future developments.

Frank Harwayne, FCAS, MAAA

For release November 20, 1977.
at CAS Workshop

NOVEMBER, 1977

EXHIBIT - I

SCHEDULE P - WORKERS' COMPENSATION

ANALYSIS OF IBNR RESERVES

1976

(A) Years in Which Losses Were Incurred	(B) Premiums Earned	(C) IBNR Losses Unpaid	(D) 1 Year Development of IBNR Losses	(E) Ratio (D)÷(B)	(F) E Cumulated Down	(G) Estimated IBNR Reserves (F)x(B)	(H) Indicated IBNR Deficiency (G)-(C)	(I) Deficiency Ratio (H)÷(B)
1. Prior to 1969	2,173,308,898*	5,965,053	9,388,714	.004320	.002745†	5,965,733	680	0.000000
2. 1969	2,173,308,898	2,993,972	3,773,288	.001736	.007065	15,354,427	12,360,455	0.005687
3. 1970	2,354,426,741	5,586,866	8,259,595	.003508	.008801	20,721,310	15,134,444	0.006428
4. 1971	2,446,466,512	9,810,116	16,450,744	.006724	.012309	30,113,556	20,303,440	0.008299
5. 1972	2,686,196,476	14,425,192	16,473,367	.006133	.019033	51,126,378	36,701,186	0.013663
6. 1973	3,119,875,831	21,362,549	31,794,532	.010191	.025166	78,514,795	57,152,246	0.018319
7. 1974	3,510,187,420	61,998,635	66,576,895	.018967	.035357	124,109,697	62,111,062	0.017695
8. 1975	3,968,458,779	123,019,284	402,022,899	.101305	.054324	215,582,555	92,563,271	0.023325
9. 1976	4,876,756,744	665,597,598	-	-	.155629	758,964,775	93,367,177	0.019145
10. Totals	4,876,756,744**	910,759,265	554,740,034	xx	xx	1,300,453,226	389,693,961	0.079908

*Annual estimate based on 1969
**Annualized estimate based on 1976
†(C)÷(B)

Column (B) from Schedules P part 1D
Columns (C) and (D) from Schedules P part 1F
Presented at 11/20/77 CAS Workshop