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

By Frank Harwayne

Discussion by David R. Bickerstaff

It is axiomatic among casualty actuaries that the subjects of profit/contingency factors, investment income, and measurements relating to the "riskiness" of an insurer's underwriting portfolio are interrelated and cannot be fairly appraised in isolation from one another. With his "Restatement" Mr. Harwayne has offered a major contribution to the literature covering these interdependent concepts. His paper serves as a comprehensive, carefully organized guided tour through the rudiments of investment income measurement, methods for quantifying the "riskiness" of an insurer's book of business, and the appropriateness of introducing investment income measurements directly into the ratemaking formula - all exclusively from the standpoint of one line, Workers' Compensation. The paper quite obviously has directed its attention primarily to observers of the insurance business, particularly those in the regulatory fraternity, to whom the interdependence of the three above mentioned concepts is not such a truism.

The most cogent sections of the paper are those in which Mr. Harwayne addresses the riskiness of writing Workers' Compensation insurance, with ample documentation of the recent nationwide experience in this line. (Indeed, this reviewer counted at least four choruses proclaiming that "Workers' Compensation is a risky business", skillfully and strategically placed throughout the work.) The 1972 to 1976 countrywide experience of Workers' Compensation is recited as evidence of the recent unpredictability of this line. Mr. Harwayne's

methodology in quantifying the riskiness of Workers' Compensation is something of a variation on the duel measurements employed in the A.D. Little risk/rate-of-return studies of a decade ago. Risk is equated to variation from expected loss ratio first using a "spatial" dimension (the variation of all writers' loss ratios around the mean for one year) and then from a "temporal" standpoint (the unpredictability of the companywide expected loss ratio over time). One will remember that the original A.D. Little studies observed that for the insurance industry the temporal risk was extremely high compared to other industries but that the spatial risk was not that significant - i.e., given an industrywide mean loss ratio for one year, the individual companies seem to cluster around that mean rather closely.

As for the temporal risk factor, Mr. Harwayne observes that over the five year period 1972 to 1976 the industry "missed the target" loss ratio by 9.7% of standard premium - not the most precise measurement of risk in probabilistic terms, but a significant after-effect of the recent unpredictability, nevertheless. Mr. Harwayne's data on individual companies' loss ratios in 1976 appears to be offered as a refutation of the earlier observation on spatial risk. The spread around the industrywide loss ratio is such that 30% of the business (weighted by premium volume) suffered loss ratios higher than 105% of the industrywide average and 23% of the business was higher than 110% of the average. Using this 1976 loss ratio spread, Mr. Harwayne concludes that "even if ratemaking actually achieved 2.5% for underwriting profit, 20% of the business would suffer a net income loss" (including investment income, for one year, for one line - Workers' Compensation).

This reviewer wonders if the conclusion Mr. Harwayne is implying from his observation of the loss ratio spread may be somewhat of an overstatement of

the case, which may tend to weaken his risk argument to some degree. Does it follow that a profit/contingency allowance should be selected at a level high enough that only a small percentage (say 5%) of companies (weighted by premium volume) should suffer a net income loss for one year for a single line of business? What about the large multi-line carriers for whom Workers' Compensation is a relatively insignificant line? A casual glance at the 1976 loss ratio distribution used by Mr. Harwayne reveals that there were a few instances of very high loss ratios on small premium volume which could bias the table. As Mr. Harwayne points out, there are very few carriers who write Workers' Compensation exclusively. It would clearly be an overstatement of the problem if we simply set out to determine a level for profit/contingency allowances for all lines which would ensure that about 90% (or some other selected level) of the companies would achieve at least a break-even, after-investment income, for every line for every year. To get a clear picture of what is happening in the domain of spatial risk, it would seem to this reviewer that one should study the interrelationship of results between different lines. How correlated are they? Do some liability lines ease off during the years when others experience upswings?

In his section on the principles of investment income measurement, Mr. Harwayne has chosen to consider the investment income on unearned premium reserves and loss reserves separately, as has been the case in many other papers on this subject. He has appropriately used a five year average investment return, which measured 5.25%, before tax but after investment expense. After the usual deduction for delayed remission of premiums and accounting methods (admittedly rough but apparently reasonable estimates) Mr. Harwayne estimated that the investment income from unearned premium reserves as a percentage of standard earned premium was .69% before federal income tax and .59% after

federal tax.

In his calculation of the investment income attributable to loss reserves, Mr. Harwayne has included some details which this reviewer considers quite pertinent but which nevertheless have not been brought to the forefront in previous discussions of this kind. Mr. Harwayne has determined the percentage of countrywide losses by type of injury (subdivided by indemnity and medical), and for each has listed the percentages paid in lump sums and those paid in annuity fashion. For those partial amounts estimated to be paid periodically to widows or disabled workers, average durations of cases (in years) are also given. Again based on a 5.25% rate of return, the investment income from loss reserves as a percent of premium was 3.94% before tax and 3.37% after tax. Although in this reviewer's mind this method of measuring investment income is more instructive than simply taking the investment income amount allocated by line in the insurance expense exhibits (which Mr. Harwayne wisely opted to ignore), it would be even more useful to determine the complete payout pattern for losses, by injury type, incurred in one accident year, over the ensuing calendar years. This would enable a more precise calculation of the present value of losses by injury type and, with the appropriate provision for delayed remissions of premiums, the investment income attributable to unearned premium and loss reserves could be considered together.

The combined yield from investment income from both unearned premium and loss reserves before federal income taxes is 4.63%, based on Mr. Harwayne's calculations. If the 2.5% underwriting margin were achieved, the total return from both underwriting and investments of policyholder funds would be 7.13% before tax and 5.26% after tax. That the industry as a whole has not achieved this

level of net income over the most recent five years is well documented in Mr. Harwayne's paper. Moreover, he recites again that, among other regulated businesses, the insurance industry has a higher volatility and riskiness but has a lower target overall rate of return.

Rather than attempting a determination of an appropriate profit/contingency factor for Workers' Compensation which is commensurate with the riskiness of the business which he has documented, Mr. Harwayne simply concludes by offering four or five reasons which should preclude the inclusion of investment income directly into the ratemaking formula, with the premise that the present 2.5% contingency allowance should be a minimum value. Indeed, one of his arguments against incorporating investment income directly into the ratemaking process is that "the present provision of 2.5% of premium for profit and contingencies would be completely inadequate". This, of course, really is not an argument against the basic concept of inclusion of investment income in the ratemakingprocess but rather a pragmatic statement that, in the real regulatory world, a contingency loading which is truly commensurate with the riskiness of the business would be rather difficult to sell.

Mr. Harwayne also wisely points out that in order to accurately determine an appropriate rate of return from reserves, one should take into account the comparatively low-yield high-liquidity investments which are required to be carried. Consequently, using an overall average yield from the entire investment portfolio could overstate the rate of return applicable to reserves.

In setting up his admittedly oversimplified model of Workers' Compensation carrier, Mr. Harwayne used a basic assumption of a 20% annual increase in Workers' Compensation premium. Combined with the other assumptions - the

underwriting target of 2.5% gained each year, a 5% investment income rate of return, a 48% tax rate on underwriting gain and 15% on investment income - Mr. Harwayne showed that from year one to year six the ratio of premium to net worth would increase from 2.0 to 2.73. If, instead of the 2.5% target being achieved each year, the actual 1972 to 1976 results were plugged into the model, the premium to net worth ratio would increase from 2.0 to 8.32. There are two aspects of this model which bother me. First, there seems to be a rather blind reliance on the old rule of thumb that has been handed down through the ages that a two-to-one or one-to-one premium to net worth ratio is "prudent" for a Workers' Compensation (or any other property or casualty line) carrier - irrespective of units of exposure written, retention level, or any other risk related factor. It would seem to me that the basic thesis of the paper would have been better served if Mr. Harwayne had addressed the issue of the increase in the volatility of an insurer's results (related to net worth) as net worth diminishes, calling for an increase in the contingency loading in the rate itself. Secondly, the use of a 20% annual increase in premium over a six year period seems to be unrealistic, even in light of the recent two year national experience. With an expected annual increase in the average weekly wage of 5 to 6%, this would leave a trend factor in the on-level loss ratio of 14 to 15% per year. This would appear at least double the factors which have been observed in the most recent experience in some major states.

Despite the minor questions I have raised regarding Mr. Harwayne's paper, I found it to be the most complete and openhanded statement regarding risk and investment income from the insurance industry's viewpoint to be set forth in recent years. It is a paper which cannot be read casually. For one, like myself, who is not particularly well-grounded in the economic aspects of the

problem, some review of earlier works are necessary before tackling this major opus. Despite some minor questions which remain in my mind, Mr. Harwayne is to be congratulated for a major contribution to the Society.