

CORRESPONDENCE

RE: Assessing the Solvency and Financial Strength of a General Insurance Company, *J.I.A.* 114, 227.

Perhaps I should disqualify myself at the outset, since I am an actuary who specializes in life and health insurance, not general insurance. However, I am very interested in the subject of this paper. As an actuary who has assisted state insurance departments in the United States of America in a number of instances of company insolvency (coming in after a statutory insolvency has occurred), I feel a deep concern about insurance company failures. Significant costs fall on policyholders and on other insurance companies via guaranty funds which mandate participation by other insurance companies. Many, but not all, States have such funds in place. I also see the damage caused to the actuarial profession when insurance companies who nonetheless have staff or consulting financial actuaries, still fail. Too often, such failures occur not long after the company receives a 'clean' statutory statement of opinion from the actuary.

My own experiences suggest to me that the actuarial role for assessing solvency and financial strength is crucial. The deliberations of the Working Party and this resulting paper should not only help the general insurance actuary to expand his ideas and techniques, but also help to raise the consciousness level of others in the industry as to the possibilities for assessment of the circumstances, given the adequate professional help. I am in strong agreement with the conclusions of the paper as to the contribution that actuaries can make to the process of protection.

For comparison, I might make a few comments about present circumstances in the U.S.A. For a life and health insurance company, an opinion statement is required from an actuary. In the statement, the actuary attests to statutory requirements and furthermore opines that the reserves "make good and sufficient provision" for the liabilities of the company. However, the opinion statement is silent on the assets of the company. Indeed, such actuarial statements commonly specifically disclaim knowledge of the asset side of the balance sheet.

For general (casualty) insurance in the U.S.A. there exists a model regulation, adopted by the National Association of Insurance Commissioners, which calls for an opinion statement from a 'loss reserve specialist'. A loss reserve specialist may be a general insurance actuary or anyone else who is qualified to offer such an opinion. At present, only a very few jurisdictions require such an opinion of a loss reserve specialist.

Under active consideration for life companies is the notion of the 'valuation actuary' who must speak to the adequacy of assets and their coverage of the liabilities embodied in the reserves. This concept exists only on paper, but active discussion continues on many fronts. The valuation actuary, if and when he comes into being, may fairly closely resemble your life company appointed actuary.

While there is considerable agreement in the U.S.A. on the need to place more reliance on the actuary's opinion and simultaneously put more responsibility on him, there is a very significant amount of concern among actuaries about the professional liability that may be attendant to such additional responsibilities. Our court system, which judges charges of error, omission, and malpractice, is currently "out of control". In such an environment, maybe the actuary's concerns are well placed. However, I find it distressing when some charge that our profession is to a degree shirking its responsibilities. Perhaps a better and more legitimate interpretation is that many actuaries feel that the development and acceptance of adequate tools and standards of practice must precede the requirements. The paper under discussion is helpful in this regard.

The analysis of the paper correctly extends to going-concern scenarios, as well as winding-up and run-off ones. Bringing in new business goes beyond the scope currently envisioned for the U.S.A. valuation actuary's report. However, as stated in the paper, the difference between the run-off situation and the case with new business can be viewed as an indication of the amount of additional margin needed by a company in order to be actively engaged in new business. This view begins directly to address the regulators' concerns with the levels of new writings in companies. In this area the rules-of-thumb often imposed are clearly inferior to such particularized analysis.

In Appendix 3, § 3.2, it is stated that the model presented in the paper does not check solvency

(shareholder or supervisory) at points during the run-off. In our own work for company managements and insurance departments, this extension, based on present rules and requirements, is essential, since certain tests which we might otherwise sanction produce satisfactory results over the long term, but these would require regulatory intervention in the interim.

The model uses one thousand simulations in each test. I have not investigated the minimum acceptable statistical standards, but I will note that in our work for company managements, for practical reasons lesser numbers of trials have been used. The results have suggested that lesser numbers of trials were sufficient, in terms of convergence towards an adequately clear picture of the distribution of results. I wonder if perhaps many fewer simulations might suffice in general.

In Appendix 3, § 3.4 mentions the standard deviation choices tested. In practice I believe that claims experience information will often permit the development of data-based distributions and standard deviations. In our own work on health insurance, we are able to develop standard deviations which are statistically based, and on the surface more sophisticated than in the example. Could not the system itself generate standard deviations at the outset, given adequate input?

In Table A4.1, I do not understand cases 4(e) and 6(e). In these cases the mean claim ratio is 140% of net written premiums, yet the instances of insolvency are very few. Is there an EEC solvency margin present in addition to the initial asset margin of 40% of net written premiums? Or, is it the timing difference and the funds earned on assets prior to disbursement as claims payment? Otherwise, it seems like the number of failures would be much higher.

Furthermore, it is interesting to me, but perplexing, that in that table the number of cases which finish with remaining assets over 160% actually goes up as the long-tail mean claim ratio increases (cases 6(a)–(e)). The reverse is true as the short-tail claim ratio increases.

Tables A4.3 and A4.4 in Appendix 3 show the folly of simple solvency margins. It is interesting in Table A4.4 to note that the asset margin declines as a percentage of net written premiums as the net written premiums increase. This seems a reasonable finding, but many arbitrary surplus standards in the U.S.A. are not written to operate this way.

The report comments that deterministic analyses are usually not sufficient. The point is appropriately made by the authors. However, in terms of where we are today, I see deterministic analyses involving several scenarios as a useful step along the pathway which we need to tread. As an example, in the U.S.A., New York's Regulation 126 identifies seven scenarios which must be tested as a part of an actuarial filing required for annuities. The requirements for New York will strengthen materially over time, but no one is prepared to mandate stochastic testing yet.

All in all, the Working Party's project has produced an excellent paper. I hope the paper receives wide circulation in the U.S.A. as well as Europe and Great Britain.

ROBERT L. COLLETT, F.S.A., M.A.A.A.

The Working Party have replied as follows: We are indebted to Robert Collett for his comments on our paper from a transatlantic perspective. It is gratifying that he found the paper such a useful contribution to the debate on solvency, and we thank him for his comments.

We are already working on an extension to the model which will enable the balance sheet position to be examined at the end of each future year for which the company is open to business. We hope that this will make the model of more general application for management purposes and will meet the point made by Mr Collett that the model does not check solvency at points during the run-off. However, there are a number of fundamental difficulties raised by this extension, not least to define how the liabilities are to be determined at future dates on each simulation.

We used 1,000 simulations for each test in order to reduce the possibility of distortion from the particular sets of random numbers chosen. For some purposes it might be adequate to work on a smaller number of simulations, particularly when exploring the sensitivity of the financial position to changes in parameter values. However, to obtain firmer results for a given set of parameters, it would be advisable to use 5,000 simulations. For a probability of ruin of 1 in 100 this implies only 50 expected insolvencies. With 1,000 simulations and an expected number of insolvencies of 10, the random variation for different sets of 1,000 simulations can be considerable.

The point which Mr Collett makes about using claims distributions generated from the data is an example of a more general point that in practice one would seek to base the assumptions as closely as possible on the actual portfolio of assets and liabilities. We were concerned with illustrating general results from a hypothetical portfolio and therefore made somewhat stylized assumptions.

Table A 4.1 is concerned only with the run-off situation, where no future business is written. The only impact of

the high claim ratios in cases 4(e) and 6(e) is to weight the distribution of existing liabilities more heavily in the direction of short-tailed or long-tailed business respectively, since in each case the other type of business is still assumed to have a mean claim ratio of 100% of net written premiums. Since technical reserves have been established allowing for future inflation at 5% a year and no discounting, it is not surprising that a solvency margin of 40% of net written premiums produces relatively few insolvencies. The impact of continuing to write business at high loss ratios such as these can be seen in cases 4(e) and 6(e) of table A 4.2.

The increase in the proportion of simulations giving rise to remaining assets of over 160% of net written premiums is another facet of the same issue. Allowing for 5% inflation without discounting increases the reserves for our long-tailed class of business increase by 18% but the reserves for short-tailed business only by 7%. The fact that the long-tailed business shows up as more profitable is thus a direct consequence of our assumed reserving basis.

We remain convinced that a stochastic modelling approach has significant benefits to offer in terms of the understanding it gives of the dynamics of the situation. Our concern about the inadequacy of a deterministic approach was based on the view that it is more difficult to determine which aspects are of importance when the model does not allow explicitly for uncertainty. An approach using a variety of scenarios to test sensitivity to different assumptions is obviously preferable to using only a single set of assumptions, but there is likely to be a degree of arbitrariness about the choice of the scenarios investigated and we would prefer to see a stochastic model such as we have developed being used.

However, we must beware of raising expectations too high. An actuarial assessment of financial strength, although valuable, is limited by availability of data, lack of knowledge about the true strength of the technical reserves and a large number of unquantifiable factors in the future development of an insurance business. We are particularly concerned that assets should be taken into account alongside liabilities, as is done by the appointed actuary to a life company, at least in the United Kingdom. Without this it is doubtful whether any realistic assessment of financial strength can be made.

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