



AMERICAN ACADEMY *of* ACTUARIES

Status Report From the American Academy of Actuaries' Modeling Efficiency Work Group

**Presented to the National Association of Insurance Commissioners'
Life and Health Actuarial Task Force**

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The American Academy of Actuaries is a national organization formed in 1965 to bring together, in a single entity, actuaries of all specializations within the United States. A major purpose of the Academy is to act as a public information organization for the profession. Academy committees, task forces and work groups regularly prepare testimony and provide information to Congress and senior federal policy-makers, comment on proposed federal and state regulations, and work closely with the National Association of Insurance Commissioners and state officials on issues related to insurance, pensions and other forms of risk financing. The Academy establishes qualification standards for the actuarial profession in the United States and supports two independent boards. The Actuarial Standards Board promulgates standards of practice for the profession, and the Actuarial Board for Counseling and Discipline helps to ensure high standards of professional conduct are met. The Academy also supports the Joint Committee for the Code of Professional Conduct, which develops standards of conduct for the U.S. actuarial profession.

Modeling Efficiency Work Group

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The Modeling Efficiency Work Group is a newly created work group reporting directly to the American Academy of Actuaries' Financial Soundness and Risk Management Committee (also known as the SVL2 Committee.)

The SVL2 Committee recognizes that some of the calculations envisioned by a principles-based approach in determining statutory reserves and capital requirements can be onerous. The purpose of the Modeling Efficiency Work Group is to examine ways in which these calculations can be made more “efficient”, which means looking at modeling techniques which can help ease the burden of huge processing requirements without impacting the credibility of the results. The Work Group will review alternative methodologies, perform analyses, and make observations on when it might be appropriate to consider usage of the techniques in practice.

The Work Group recognizes that there is potential overlap with other AAA PBA initiatives. In particular, we will coordinate our efforts with the Life Capital Adequacy Subcommittee’s Economic Scenario Work Group and the group developing the ASOP for principles-based accounting.

The deliverables of the group are as follows:

- Short-term: The Work Group will collect background material to serve as a bibliography for this Work Group, but also for the industry and practicing actuarial professionals. The Work Group will consider the wide range of “efficiency techniques”, and will then establish those techniques that hold the most promise in terms of being useful for calculating reserves and capital using a principles-based approach. The focus will be on approaches that are practical, rather than theoretically elegant. For example, under the category of “scenario design”, there are a number of scenario reduction techniques that look to have great potential practical application, such as the Manistre/Hancock CTE variance approach (see below). The Work Group will work to get to a common understanding of these techniques that are deemed worthy of further analysis, and in turn be able to clearly articulate these techniques.
- Long-term: For the techniques agreed by the Work Group to be those worthy of further analysis, models will be constructed to test the mechanics and applicability of each technique. The Work Group will prepare a report that:
 - (1) describes each of the techniques chosen in terms that can be easily communicated to practicing valuation actuaries,
 - (2) outlines the work we have done in looking at the alternative approaches, and
 - (3) based on our work, makes observations about the features of the various techniques and indicates in what situations there may be scope for using the techniques for purposes of calculating statutory reserves and capital. In this regard, our task is to identify possible methodologies that will simplify the computational aspects of using a principles-based approach in calculating

reserves and capital , and to provide useful background material for actuaries interested in pursuing these techniques in practice.

- Our paper will be delivered by June 30 2008.

To date, the Work Group has reviewed a number of key papers under the heading of scenario design:

- Sarah Christiansen, “Representative Interest rate Scenarios”, NAAJ, Vol. 2, No.3 (July 1998)
- Alistair Longley-Cook, “Probabilities of ‘Required 7’ Scenarios (and a Few More)”, The Financial Reporter (July 1997)
- Yvonne Chueh, “Efficient Stochastic Modeling for Large and Consolidated Insurance Business: Interest Rate Sampling Algorithms”, NAAJ, Vol. 6, No. 3 (July 2002)
- John Manistre and Geoff Hancock, “Variance of the CTE Estimator”, NAAJ, Vol. 9, No. 2 (April 2005)

We are also beginning to consider issues around the construction of models to help us test the effectiveness of the various techniques in particular circumstances.

While the Work Group is still in its early days, we have already established certain workstreams around which we will be building our project plans, which are outlined as follows:

Workstream	Description
1. Model development and testing	<ul style="list-style-type: none"> ■ Create models and test bed ■ Create test metrics (what identifies one modeling method is better than another?) ■ Run models, present results
2. Bibliography/ synopsis	<ul style="list-style-type: none"> ■ Compile and maintain a list of all the relevant research/reference materials ■ Include a brief description of the document for major pieces, include a more detailed synopsis
3. Glossary of terms	<ul style="list-style-type: none"> ■ Compile and maintain a “dictionary” of commonly used modeling efficiency expressions/terminology
4. Industry survey	<ul style="list-style-type: none"> ■ Establish topics to be covered ■ Develop interview guide ■ Identify interviewees ■ Conduct interviews ■ Compile results/write report

5. Report	<ul style="list-style-type: none">■ Use material created by Modeling Efficiency Work Group as foundation for a formal report■ Write report and bring others into the writing process as needed■ Ensure report is peer reviewed■ Present report to SVL2 Committee and others
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