C-1
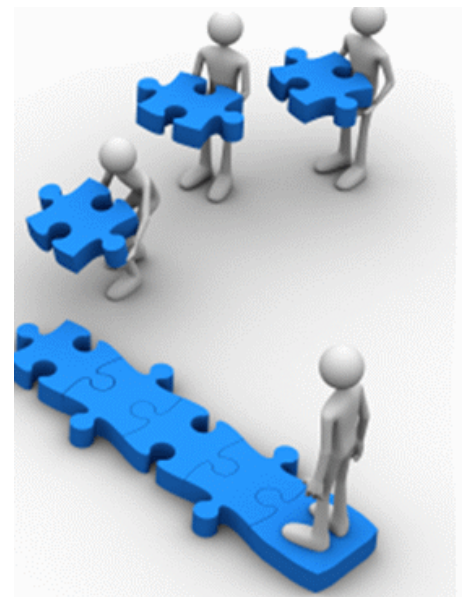# The CAS Loss Simulation Model: Background
2013 CAS Spring Meeting

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Loss Simulation Model Working Party

- Sponsored by the CAS Dynamic Risk Modeling Committee (DRMC) in 2005, the LSMWP began work in 2006.

- Purpose: creation of a simulation model that will generate claims that can be summarized into loss development triangles and complete rectangles.

- Deliverables: Open source program available to CAS members, seminars, and a CAS Working Party paper documenting work.

- Time Frame: (a) Completed when model and paper were uploaded after the 2010 CLRS.

  (b) Enhanced with the 2011 CLRS Call Paper Program

LSMWP Paper

- Introduction provides overview of project.

- Survey of existing literature

- Statistical tests of simulated model output: general discussion

- Basic features in the prototype model.

- Documentation of the open source model.

- Testing detailed output and fitting the model.

- Potential applications and model enhancements.

- Appendices: User instructions including parameterization of all distributions included in the model, a bibliography, and technical details on statistical tests performed.

Where can we access Loss Simulation Model and documentation?

- The help files in the new open source Loss Simulation Model document all model features.

- The Loss Simulation Model, together with all model documentation, related papers and seminars, are located on CAS Loss Simulation Model and Documentation web page:

  www.casact.org/research/lsmwp

- Program instructions for the initial version of the LSM are provided in Appendix A of the LSMWP paper. Updated instructions are included within the model and on the CAS Loss Simulation Model and Documentation web page.

Reserve Variability

- If you run at least 100 iterations, the model will generate reserve percentile tables and customary statistics from the simulation results (e.g., mean, standard deviation, minimum and maximum).

- These tables are distributions of payments made subsequent to the assumed valuation date, both by accident year and by calendar year and for all years combined.

- This key model feature enables users to test their models for estimating reserve variability.

- Important application: estimating capital needed to support reserves.

Recent Enhancements

- The documentation within the model and on the CAS web site has been kept up to date as this open source software has been updated and enhanced.

- Kailan Shang's prize winning 2011 CLRS paper on "Loss Simulation Model Testing and Enhancement" yielded much needed additional model testing that the volunteers on the LSMWP did not have the time to complete, as well as a valuable model enhancement and other useful suggestions for improvements.

- These model enhancements have been programmed and tested and will now be discussed by Hai You and Joe Marker. The updated model is on the CAS LSM web page.

Summary

- The LSMWP developed and fully documented a model that we hope will become a valuable tool in researching loss reserving methods and models.

- We encourage actuaries to develop and document model enhancements through call paper programs.

- We hope that actuaries will use this model to:
  - Better understand the underlying loss development process.
  - Determine which methods and models work best in different reserving situations.
  - Reflect this knowledge in evolving loss reserving practices.