AMERICAN ACADEMY *of* ACTUARIES

Objective. Independent. Effective.™

American Academy of Actuaries Long-Term Care (LTC) Principle Based Reserves (PBR) Work Group

Update to Long-Term Care Actuarial Working Group

August 15, 2014

Al Schmitz, MAAA, FSA, Chairperson

LTC PBR Work Group

Agenda

- Work group objective

- Update

- Report outline

- Next steps/timeline

- Questions

AMERICAN ACADEMY
of ACTUARIES

*Objective.*
Independent.
Effective.™

Objectives of Work Group

- Based on the initial request from the NAIC, the objective of the work group is to develop a prototype stochastic model to be used to help set the direction of PBR for LTC
  - The work group agreed to produce a report that would include considerations of stochastic modeling and suggested next steps
  - The model is intended to be illustrative and not inclusive of all policy features that may be offered by an insurer or inclusive of detailed modeling considerations

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

History and Work to Date

I. Stochastic modeling–key variables: morbidity, lapse, mortality, interest

II. Modeling approach–morbidity, mortality, and lapse in Excel prototype using "hazard rate approach"

III. Modeling considerations–premium rate changes, interest rate impact, morbidity / mortality changes, margins

IV. Assumptions and data collection–sample assumptions developed by the work group, two inforce files provided by two companies

V. Stochastic and deterministic results

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™
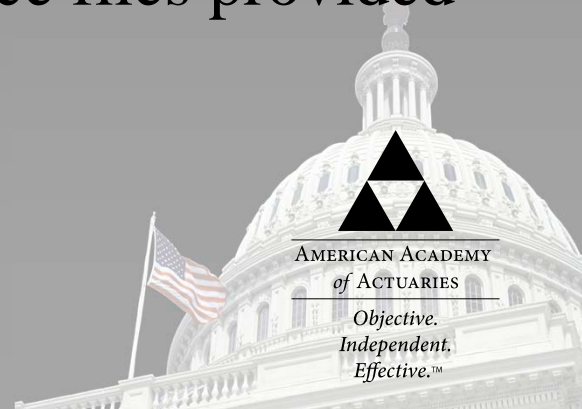
Update on Recent Activity

Sensitivity tests to base case

- Run the following sensitivities on the block of 6,000 policies and calculate CTEs for each:

  - $\pm$10% load to morbidity incidence and assessment - Complete
  - $\pm$10% load to morbidity termination rates
  - $\pm$10% load to lapse rates
  - $\pm$10% load to active mortality rates
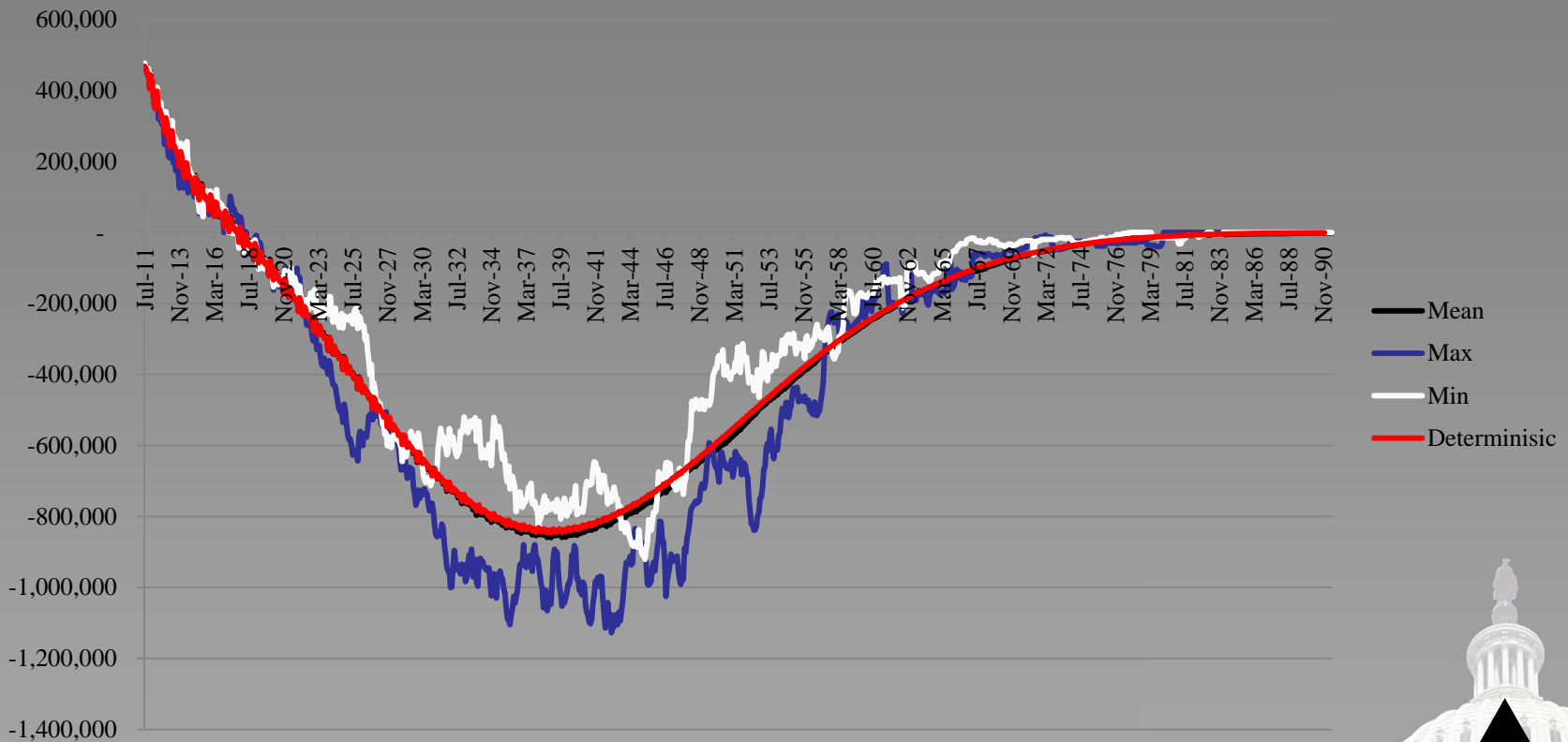 - $\pm$10% load to disabled mortality rates

Sensitivity tests to size of block and number of scenarios

- Run the 23,000 block of policies and test impact for running 1,000, 500, 250, 100, or 50 scenarios.

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

Initial Results

Comparison to Deterministic – Inforce Block of LTC Insurance

Sample block of 6,000 policies-Graph developed by members of the work group. For illustrative purposes only.

Initial Results (cont.)

Distribution characteristics of present value of cash flow at 4 percent

- Mean   87 m

- Maximum   106 m

- Minimum   72 m

- Standard Deviation 5.261 m

- Skewness   0.138209

- Kurtosis   0.168010

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

Initial Results (cont.)

■ **Sample block of 6,000 LTC insurance policies, CTE calculations**

CTE 0 (GPV)	87m	100.0%
CTE 10	88m	101.2%
CTE 20	89m	102.1%
CTE 30	90m	102.9%
CTE 40	90m	103.8%
CTE 50	91m	104.8%
CTE 60	92m	105.8%
CTE 70	93m	107.1%
CTE 80	95m	108.6%
CTE 90	97m	110.8%
CTE 95	98m	112.8%
CTE 99	103m	117.8%

Note: CTE 90, for example, is equal to the average of the worst 10 percent of scenarios, each scenario cash flows discounted at 4 percent

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

Initial Results (cont.)

Distribution characteristics of present value of cash flow at 4 percent

	Academy PBR LTC Model Runs			
	Base	Incidence Plus 10%	Incidence Minus 10%	Active Mortality Minus 10%
Mean	87,130,339	99,228,164	74,036,463	94,746,011
Max	106,262,080	117,344,432	92,581,823	110,851,459
Min	72,487,960	80,432,369	59,192,117	80,400,667
Skewness	0.138	0.058	0.210	0.089
Kurtosis	0.168	-0.146	0.278	-0.050
Std Dev	5,261,055	5,638,591	4,949,694	5,292,701
Std Dev / Mean	6.0%	5.7%	6.7%	5.6%
CTE 0	100.0%	100.0%	100.0%	100.0%
CTE 10	101.2%	101.1%	101.3%	101.1%
CTE 20	102.1%	102.0%	102.3%	101.9%
CTE 30	102.9%	102.8%	103.2%	102.7%
CTE 40	103.8%	103.7%	104.2%	103.6%
CTE 50	104.8%	104.5%	105.3%	104.4%
CTE 60	105.8%	105.5%	106.4%	105.4%
CTE 70	107.1%	106.6%	107.8%	106.5%
CTE 80	108.6%	108.1%	109.5%	108.0%
CTE 90	110.8%	110.2%	112.3%	110.1%
CTE 95	112.8%	111.7%	115.0%	111.8%
CTE 99	117.8%	114.7%	119.9%	115.1%

Developed by members of the work group. For illustrative purposes only.

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™
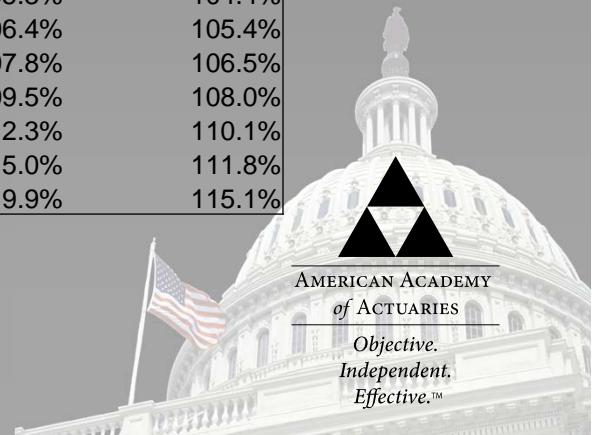
Report Outline

- **Introduction**

- **Objective of Academy workgroup**

- **Brief history of workgroup**

- **Description of model**
  - Strengths/weaknesses
  - Documentation including flow chart

- **Description of analysis performed**
  - Summarize project plan

- **Results**

- **Discussion**
  - Result considerations
  - Modeling considerations
  - PBR implications

- **Potential next steps**

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

Target Timeline

- **Complete sensitivity tests and summarize results**
  - End of September

- **Run larger block of policies (20,000) through model and analyze results.**
  - End of October

- **Summarize results in written report**
  - Draft end of November

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
*Effective.*TM

Questions

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™

Staff Contact Information

Tim Mahony

Health Policy Analyst (State)

American Academy of Actuaries

1850 M St., NW (Suite 300)

Washington, DC 20036

202-223-8196

mahony@actuary.org

AMERICAN ACADEMY
of ACTUARIES

Objective.
Independent.
Effective.™