POLICYHOLDER BEHAVIOR IN THE TAIL
UL WITH SECONDARY GUARANTEE SURVEY
2008 RESULTS

Highlights of Survey
- 67% of respondents project at least 200 scenarios.
- 89% use a projection horizon of at least 75 years.
- There is a wide variation across insurers in the description of the tail scenario, defined as causing the largest present value loss from the secondary guarantee. Although generally speaking, most insurers show declining interest rates in their tail scenario.
- 83% of insurers distinguish lapse rates based on the presence of a secondary guarantee.
- Among those 83%, the majority described a function that sets lapse rates to 0% when the cash value is zero. As a result, the number of policies in force with the no lapse guarantee after attaining a zero cash value may vary significantly from very few to 30% of the original sales.
- Assumed lapse rates vary widely across insurers. For some issue age and duration combinations the difference between the lowest and highest annual lapse assumption exceeds 10%.
- Lapse rates in the tail scenario tend to decline as the issue age increases.
- Lapse rates in the tail decline as the policy duration increases.
- Reported lapse rate assumptions are not impacted by the end of the surrender charge period, which would be consistent with UL with Secondary Guarantee products being purchased for protection and not for cash accumulation.
- "Best Guess" and "Company Experience" are the most popular responses regarding the source of assumptions.
- 78% of insurers perform lapse studies, and of those, 86% perform them annually.

Acknowledgements
The Policyholder Behavior in the Tail (PBITT) working group gratefully acknowledges Stephen Hodges and Michael Altier for all of their efforts in analyzing the survey data and drafting the results report.

Special thanks to all of the companies that responded to the survey and provided helpful information. Without their efforts, this survey would not be possible.

The Policyholder Behavior in the Tail group is interested in comments on the survey and results. Please e-mail comments to either Jim Reiskytl, Chair of the Policyholder Behavior in the Tail group at jimreiskytl@wi.rr.com or Steven Siegel, Society of Actuaries Research Actuary at ssiegel@soa.org
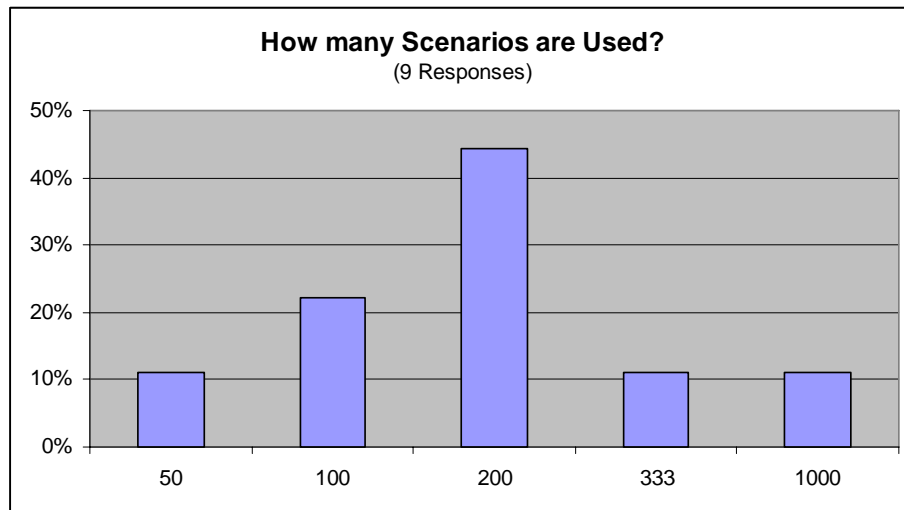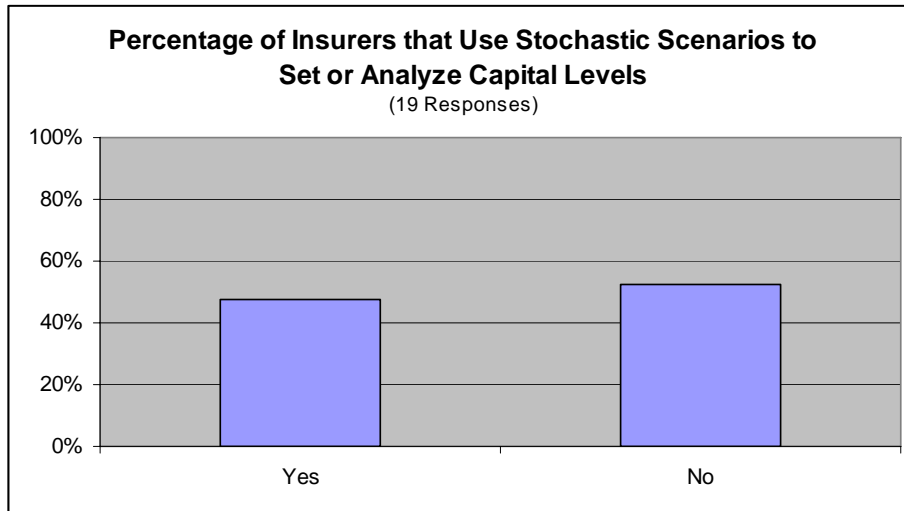
Background
In 2008, the Policyholder Behavior in the Tail (PBITT) committee distributed a survey to insurers and asked for feedback on assumptions in the modeling of Universal Life with Secondary Guarantees. The goal of the survey was to gain insight into companies' assumptions in the tail of a stochastic capital calculation. This survey had 19 responses, however not every
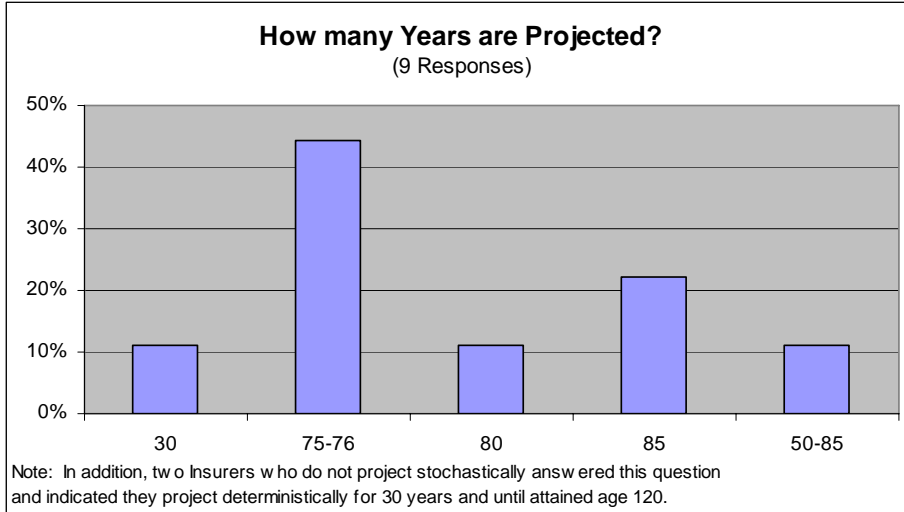
company answered every question. As a way to illustrate the credibility of results, most charts indicate how many companies responded to the question.

It is the intention of the PBITT committee to conduct this survey annually. It is our hope that with the publication of these and future survey results, we'll increase the availability of industry experience for all companies to consider when setting assumptions or when extrapolating to the tail.

Parameters of Stochastic Capital Calculation

Insurers were asked to indicate whether or not they analyze capital levels for UL with Secondary Guarantees using stochastic scenarios, as well as how many scenarios are used and the length of the projection. The following graphs show the responses to these questions. About one-half of insurers use stochastic scenarios to set or analyze capital levels. 200 scenarios and 75-76 years were the most popular answers regarding the number of scenarios used and the length of the projection.

Percentage of Insurers that Use Stochastic Scenarios to Set or Analyze Capital Levels
(19 Responses)

How many Scenarios are Used?
(9 Responses)

How many Years are Projected?
(9 Responses)

Years	Percentage
30	11%
75-76	44%
80	11%
85	22%
50-85	11%

Note: In addition, two Insurers who do not project stochastically answered this question and indicated they project deterministically for 30 years and until attained age 120.
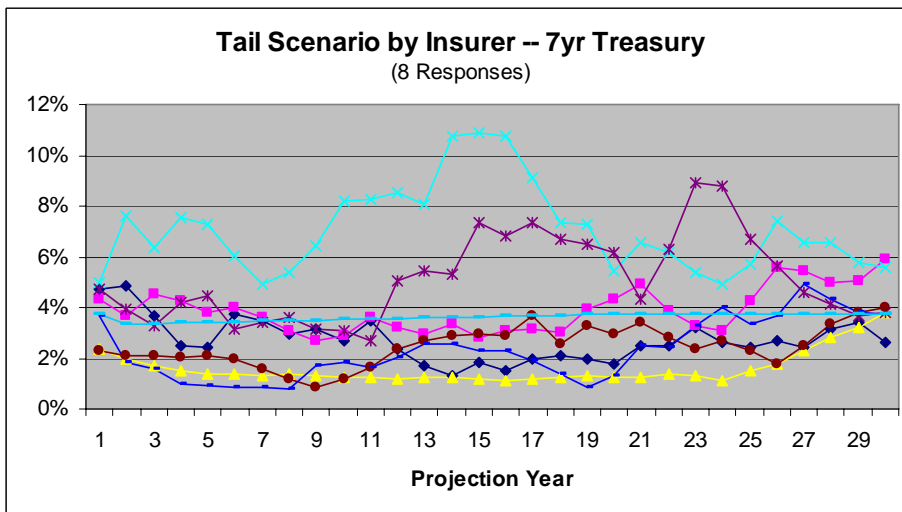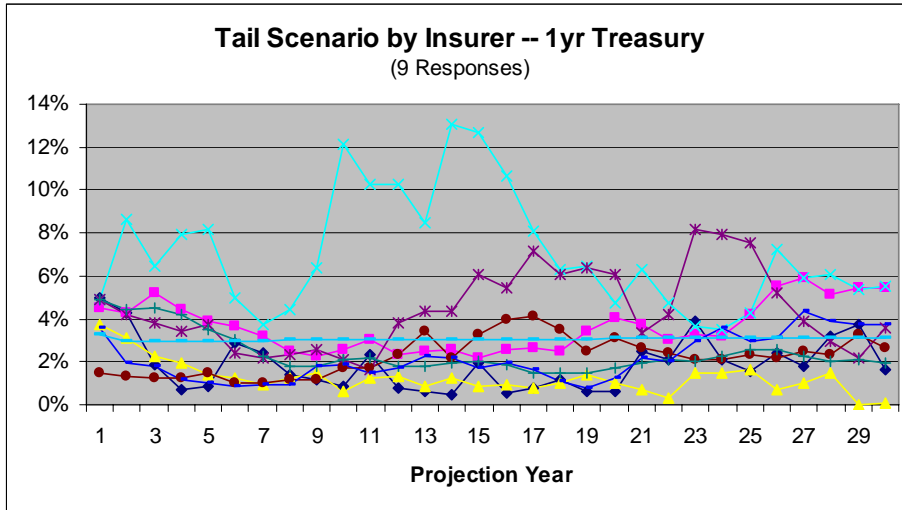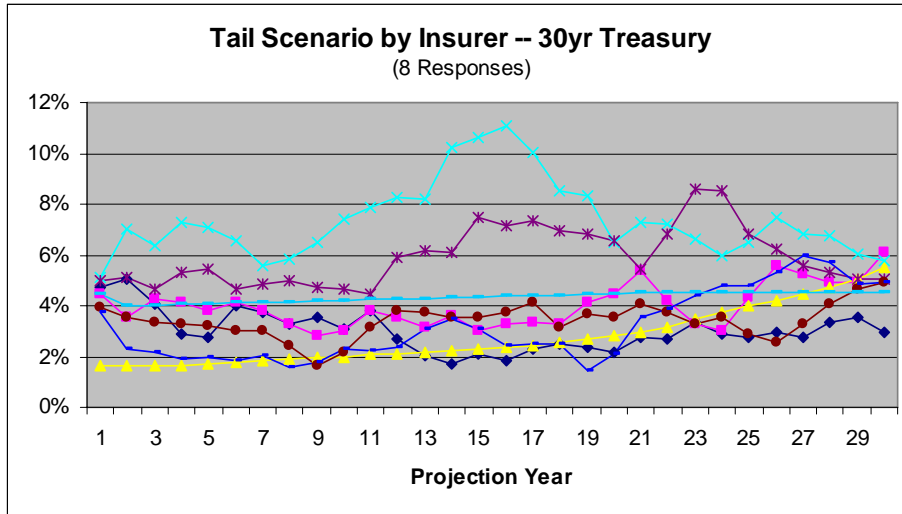
Presumably the company that responded with the answer of 50-85 years varies the projection length by issue age.

Tail Scenario

Insurers were asked to list 1yr, 7yr, and 30yr interest rates in the tail scenario that gives the largest present value loss, defined in the survey as the greatest amount of death benefits paid in years where no COI is collected. Responses varied widely across insurer regarding the description of the tail scenario. The charts below show each insurer's tail scenario for the three maturities.

Tail Scenario by Insurer -- 1yr Treasury
(9 Responses)

Tail Scenario by Insurer -- 7yr Treasury
(8 Responses)

Tail Scenario by Insurer -- 30yr Treasury
(8 Responses)

The following graph shows the median of the three maturities across insurer. It should be noted that these lines do not represent any one company's response, but rather the median rates at each duration, across all companies' responses.

Median Tail Scenario Across Insurers
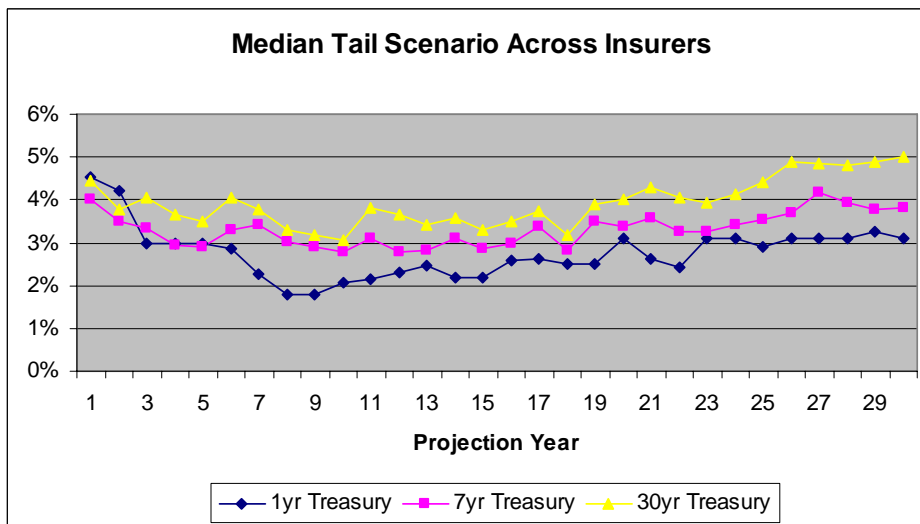
Lapse Assumptions

The following chart shows the percentage of insurers whose lapse assumptions vary for policies with and without secondary guarantees. The vast majority use different lapse assumptions depending on the presence of a secondary guarantee.

Do Lapse Assumptions Differ Between Policies with and without Secondary Guarantees?
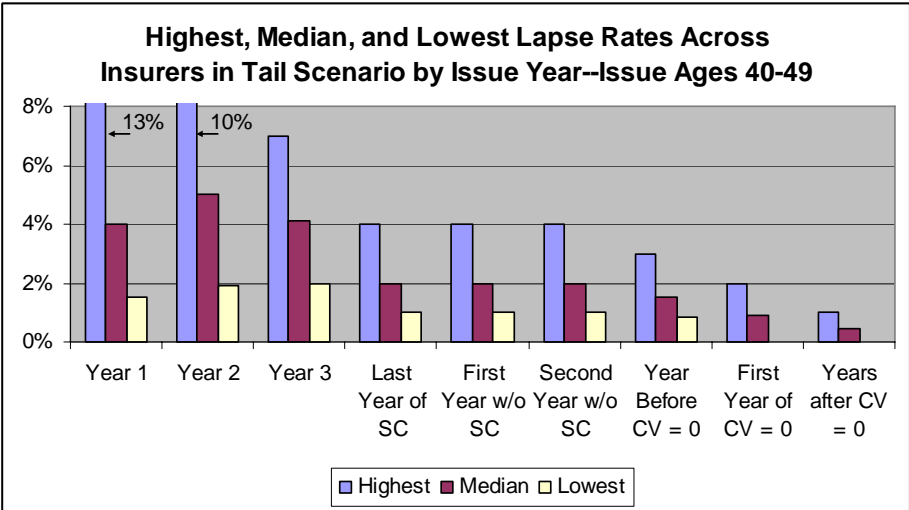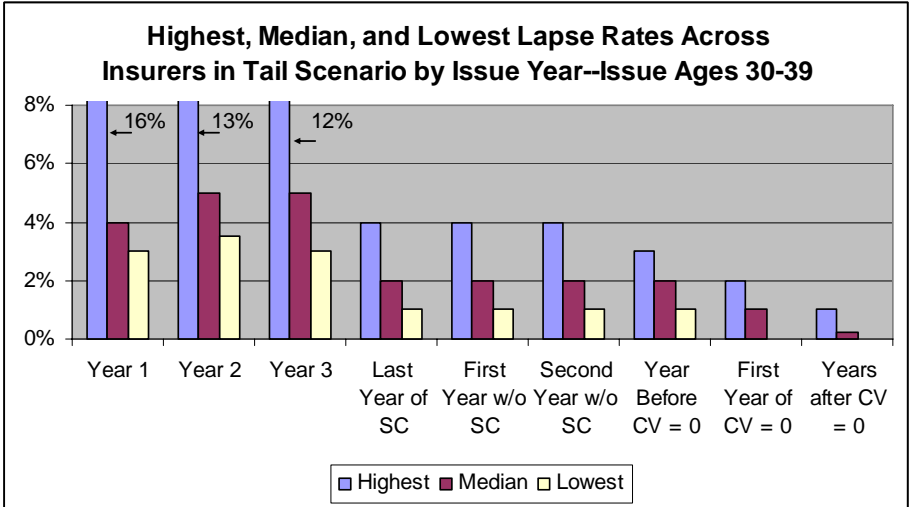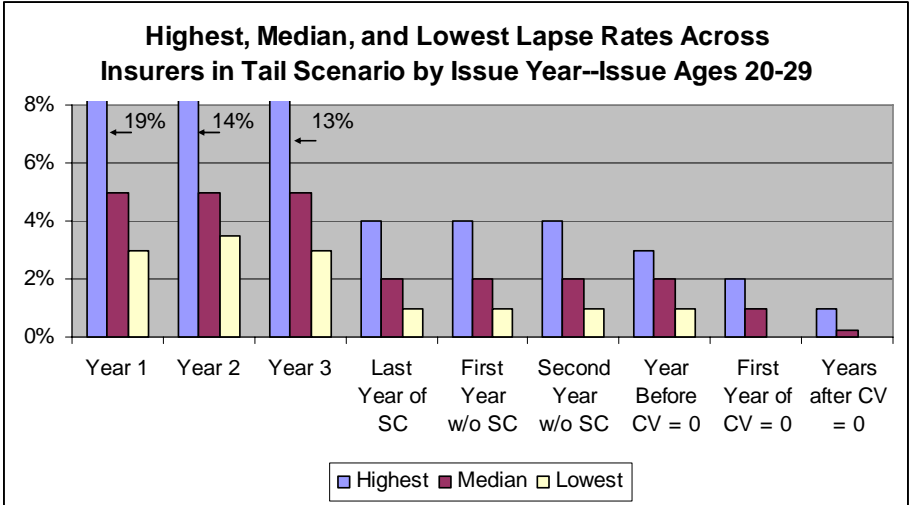(18 Responses)
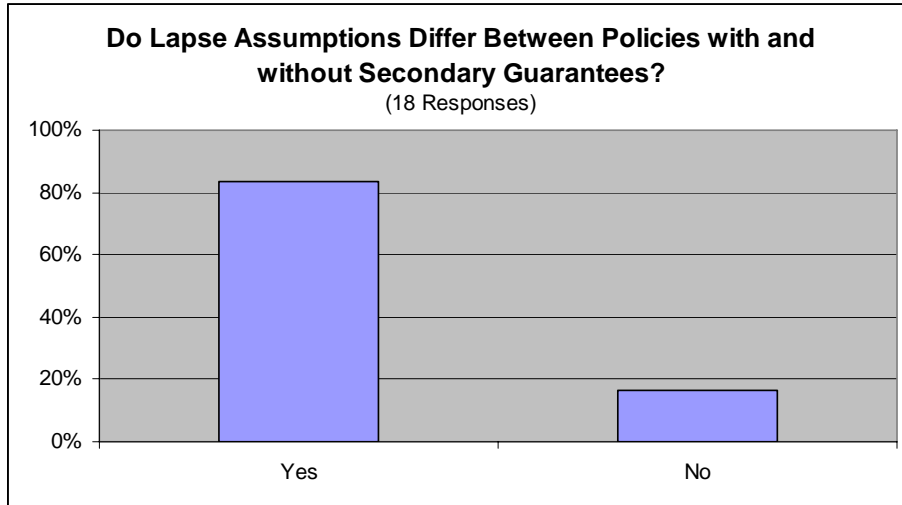
Next, insurers were asked to describe their dynamic lapse function used for policies with secondary guarantees.

Describe the Lapse Function for Secondary Guarantees
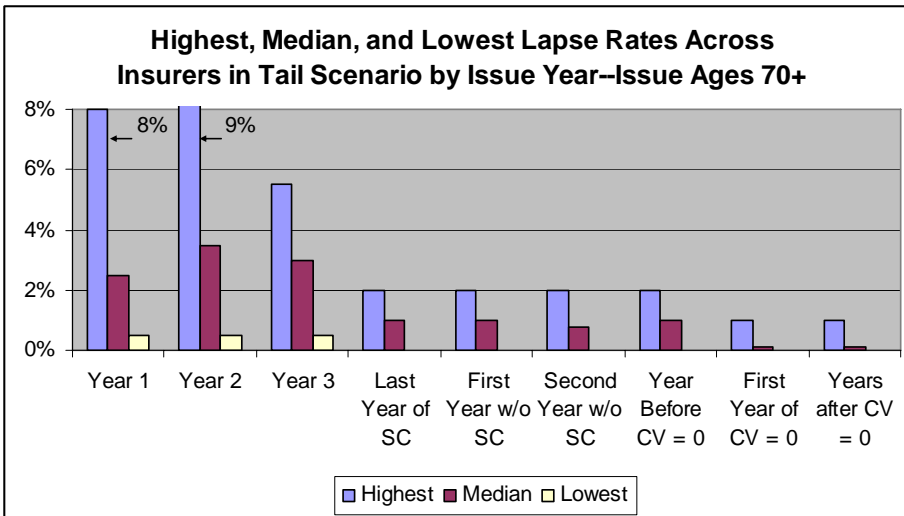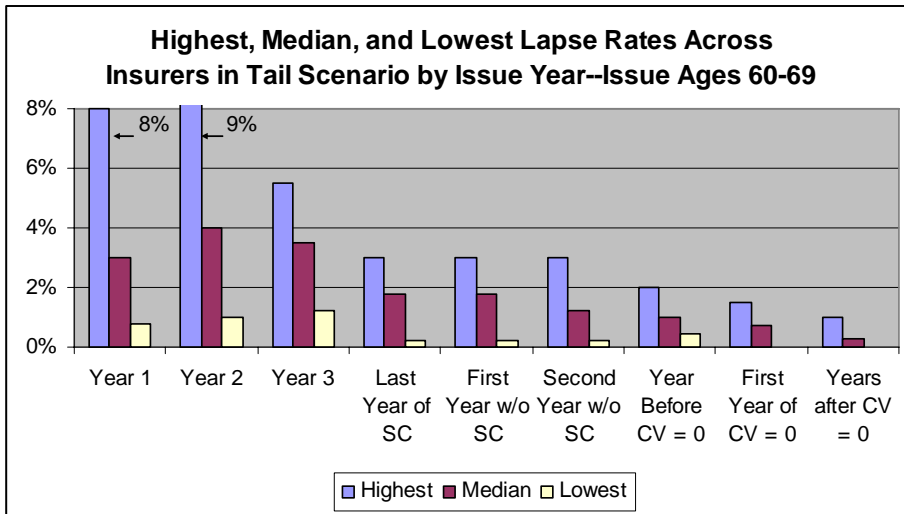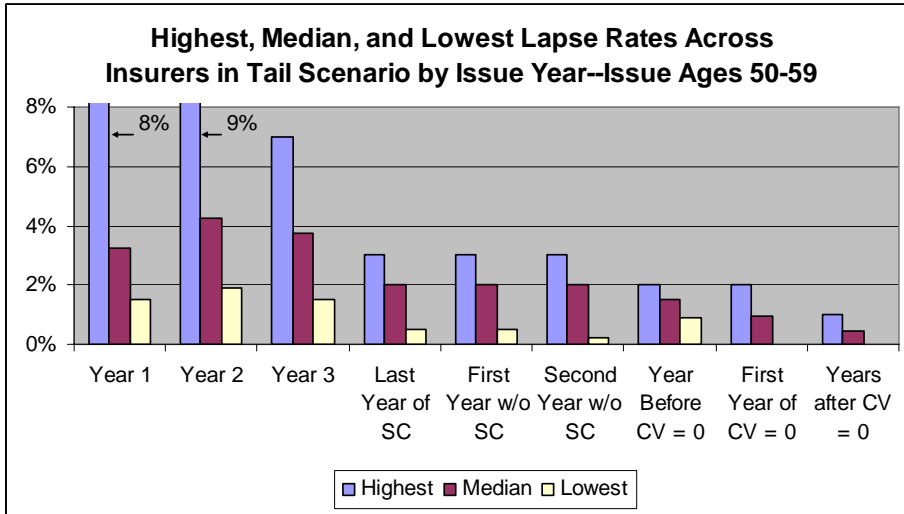(15 Responses)
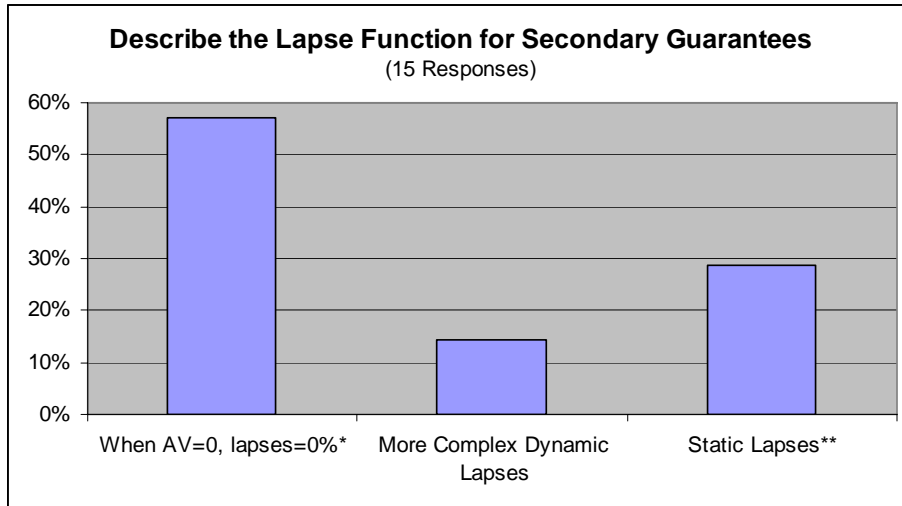
*5 of these 8 insurers indicated that when AV=0 and future premiums are required, lapses are set just above 0%.
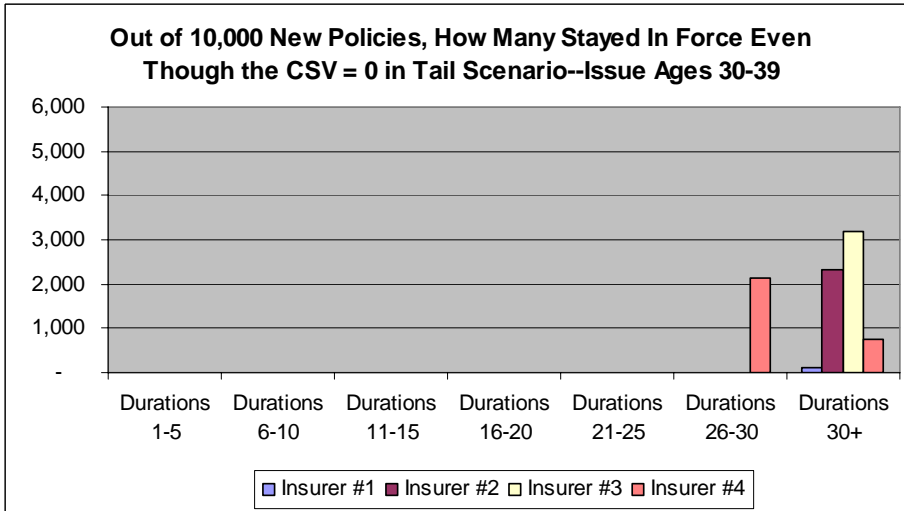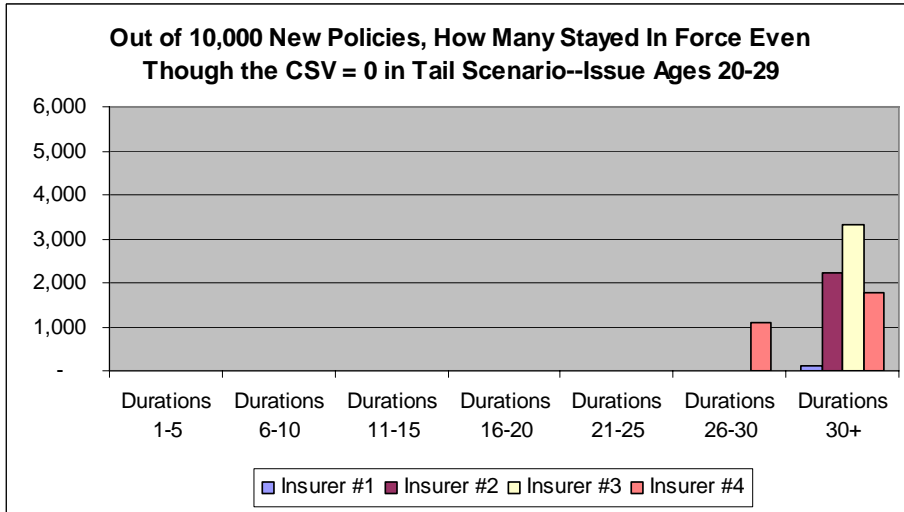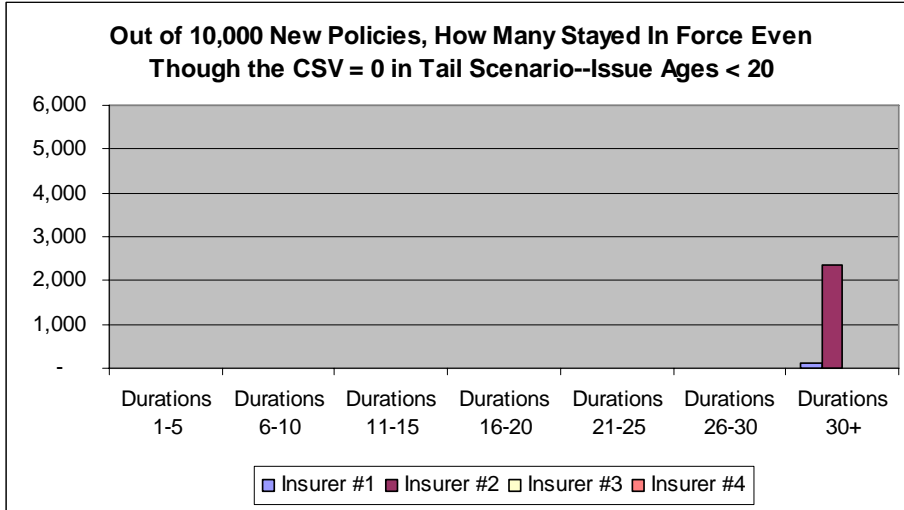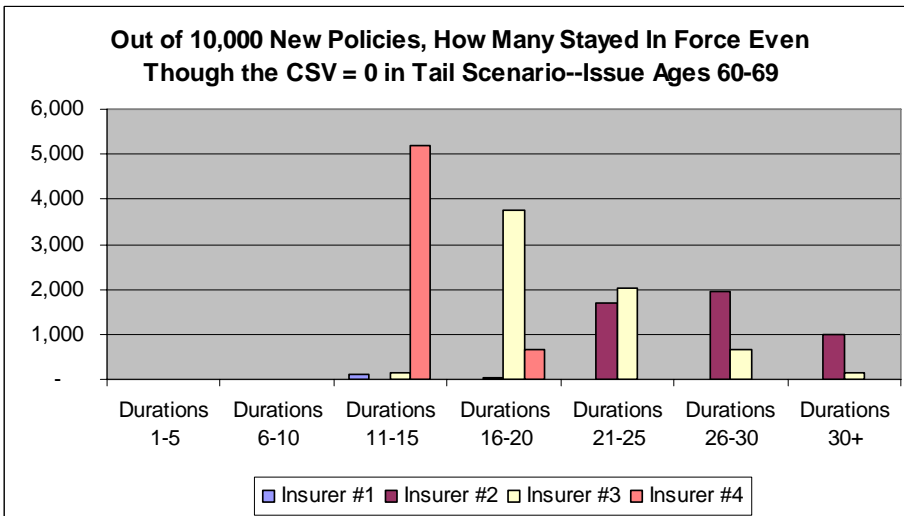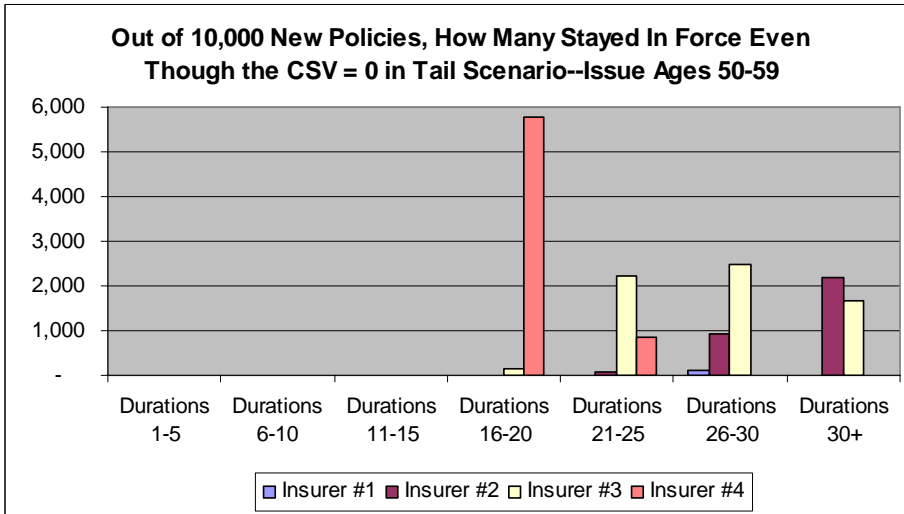**3 Insurers listed static lapses of 0.25% to 1.25%; the other only indicated that lapses are static.

Insurers were asked to list their lapse assumption in the tail scenario by duration and by various issue ages. The charts below show the Highest, Median, and Lowest lapse rates used across duration. Each issue age group is presented in a different graph. The responses of ten insurers were used in these graphs.

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 20-29

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 30-39

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 40-49

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 50-59

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 60-69

Highest, Median, and Lowest Lapse Rates Across Insurers in Tail Scenario by Issue Year--Issue Ages 70+
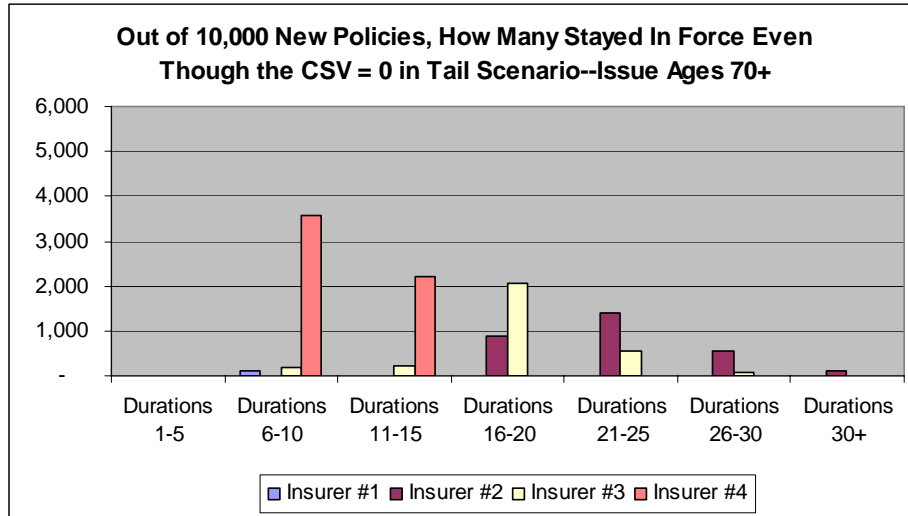

Next the insurers were asked out of 10,000 newly issued policies, how many had a cash value equal to 0, but were kept in force at various durations because of the secondary guarantee.
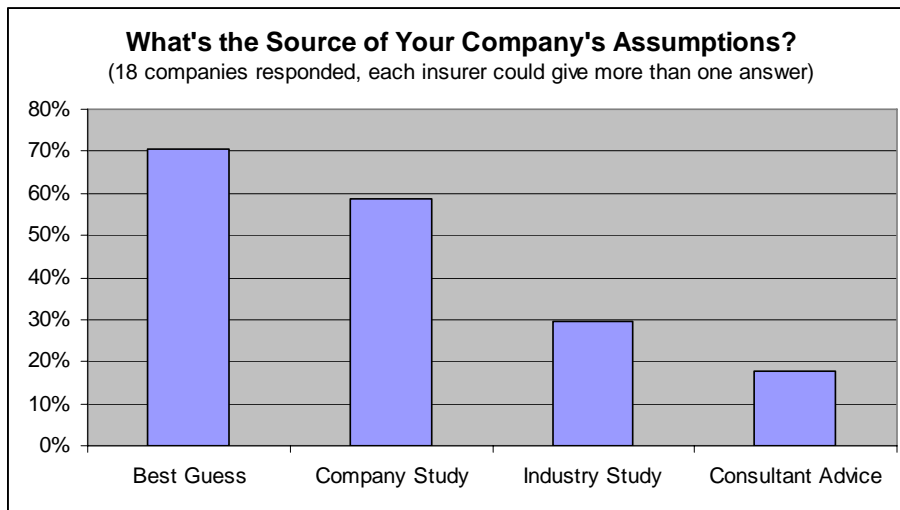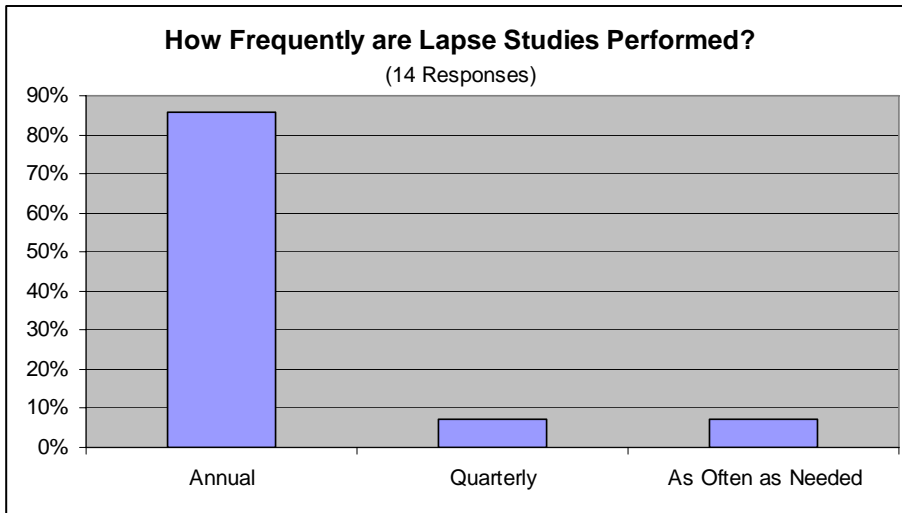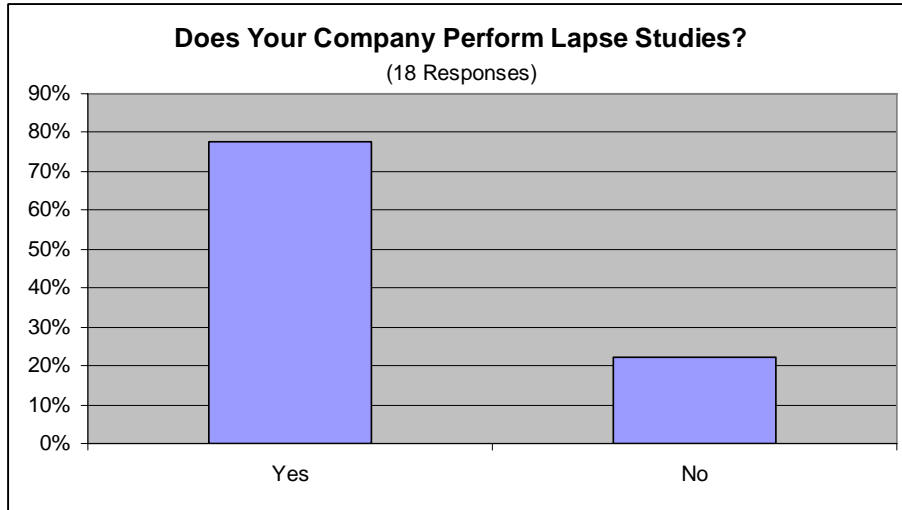
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Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages < 20

Insurer #1 □ Insurer #2 ■ Insurer #3 □ Insurer #4 ■

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 20-29

Insurer #1 □ Insurer #2 ■ Insurer #3 □ Insurer #4 ■

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 30-39

Insurer #1 □ Insurer #2 ■ Insurer #3 □ Insurer #4 ■

9

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 40-49

Durations 1-5, Durations 6-10, Durations 11-15, Durations 16-20, Durations 21-25, Durations 26-30, Durations 30+

☐ Insurer #1 ■ Insurer #2 ☐ Insurer #3 ■ Insurer #4

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 50-59

Durations 1-5, Durations 6-10, Durations 11-15, Durations 16-20, Durations 21-25, Durations 26-30, Durations 30+

☐ Insurer #1 ■ Insurer #2 ☐ Insurer #3 ■ Insurer #4

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 60-69

Durations 1-5, Durations 6-10, Durations 11-15, Durations 16-20, Durations 21-25, Durations 26-30, Durations 30+

☐ Insurer #1 ■ Insurer #2 ☐ Insurer #3 ■ Insurer #4

10

Out of 10,000 New Policies, How Many Stayed In Force Even Though the CSV = 0 in Tail Scenario--Issue Ages 70+

A bar chart with y-axis from - to 6,000 (in increments of 1,000) and x-axis showing durations: Durations 1-5, Durations 6-10, Durations 11-15, Durations 16-20, Durations 21-25, Durations 26-30, Durations 30+.

Legend: ■ Insurer #1   ■ Insurer #2   ■ Insurer #3   ■ Insurer #4

The survey asked insurers if their lapses varied by distribution system or by market. No insurer indicated that their lapses varied by distribution or market.

Insurers were asked about the source used for their assumption setting. Many insurers gave more than one response. "Best Guess" and "Company Study" were the most popular responses.

What's the Source of Your Company's Assumptions?
(18 companies responded, each insurer could give more than one answer)

A bar chart with y-axis from 0% to 80% (in increments of 10%) and x-axis showing: Best Guess (~70%), Company Study (~59%), Industry Study (~30%), Consultant Advice (~18%).

Since very few, if any, secondary guarantees are "in-the-money", we presume the answers of "Company Study" and "Industry Study" refer to the setting of the base lapse assumption before the secondary guarantee is needed to keep the policy in force.

The survey then asked if companies perform lapse studies and if so, how frequently. The vast majority perform these studies annually.

Does Your Company Perform Lapse Studies?

(18 Responses)

Yes: ~77%
No: ~22%

How Frequently are Lapse Studies Performed?

(14 Responses)

Annual: ~86%
Quarterly: ~7%
As Often as Needed: ~7%

Finally, insurers were asked how many years of experience data were used in their most recent lapse study. The vast majority used 4-5 years of data.

How Many Year of Data Were Used in the Most Recent Study?

(13 Responses)

3: ~15%
4: ~38%
5: ~38%
6-7: ~8%
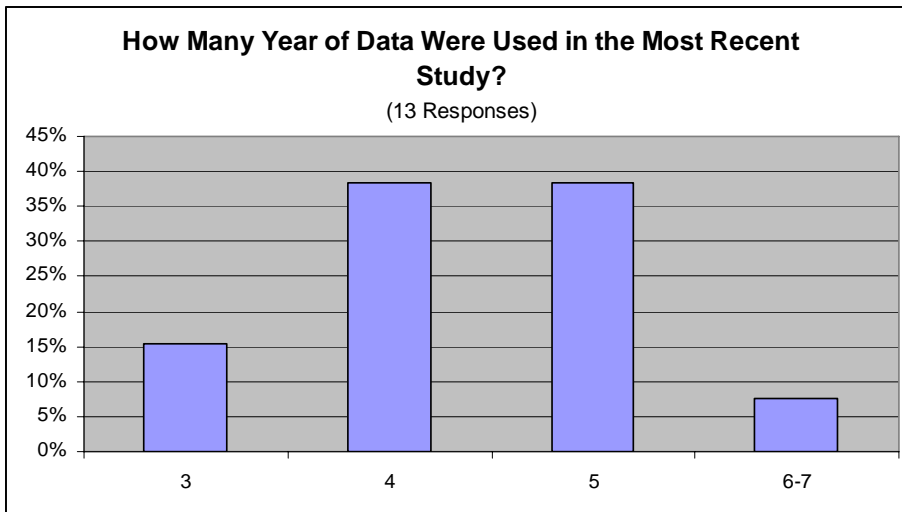
APPENDIX – COMPLETE SURVEY QUESTIONS

Policyholder Behavior in the Tail
Universal Life with Secondary Guarantees Survey

The Society of Actuaries is trying to develop better estimates of policyholder behavior in the tail (PBITT) because there is an increasing need for actuaries to assist companies, regulators and others to evaluate required surplus. Our mission is to examine and ultimately give guidance to actuaries on how to set policyholder assumptions in extreme scenarios. We are not focused on more probable scenarios which reserves should cover.

This brief questionnaire is designed to confidentially gather the range of assumptions actuaries use in pricing, setting surplus targets, and risk management of secondary guarantees on general account universal life products. Such "UL with Secondary Guarantee" products provide the policyholder with a guarantee that the death benefit will remain in force under specified circumstances even if the policy's account value is depleted.

Please report the assumptions used for policyholder behavior in the tail, whether or not data are available. Please respond even if you are unable to answer all questions. Partial responses are both acceptable and helpful.

Since efforts are being considered to place more reliance on actuarial judgement, surveys such as this one will help guide those efforts and provide useful background information. Obviously, a greater number of survey participants will enhance the value and usefulness of the survey results. As an added incentive for participants, the results will be provided to them in advance of their availability on the SOA website.

We greatly appreciate your time and efforts in helping us to attain our goal. It is our hope that the results of this survey will enhance the actuary's ability to set assumptions for these products in extreme scenarios and also enable better peer review.

We respect the proprietary nature of each company's models, and we can assure you the results will be reported anonymously and that your specific results will be held under the strictest confidence.

Please submit responses to the survey by **May 7.**

If there is any additional information that you would like to add, please feel free to email it to:
jnallon@soa.org.

Question 1: BACKGROUND

Secondary Guarantee Benefits on Universal Life Policies
List the approximate size of your company's current total UL book with secondary guarantees.

Type of Secondary Guarantee

	Yr. began writing	Net Premiums ($ millions)	Face Amount ($ millions)	Policy Count (1000s)
Long-term guarantee using **Shadow Account** Design				
Long-term guarantee using **Cumulative Premium** Design				
Long-term guarantee using **Other** Design				
Shorter term no-lapse guarantee, up to approx. 10 years				
All other UL with Secondary Guarantees				
TOTAL				

If you have material with detailed formulae or other further description of the secondary guarantee that your response to this survey is based on, please enter it below or email it to: jnallon@soa.org.

Do you have more than one version of secondary guarantee that is material to your company?
If so, please describe any material secondary guarantees not described above. If not, leave blank.

Question 2: TAIL SCENARIO for Universal Life Guaranteed Benefits

Before examining policyholder behavior in the tail, the "tail scenario" needs to be defined. Information on your particular tail scenario will provide a frame of reference for each set of results.

2a. Do you currently use stochastic modeling to set and/or analyze capital levels (i.e., required surplus) for these guarantees?

○ Yes

○ No

2b. If so, how many scenarios do you typically model?

2c. How many years in the future do you typically project?

2d. If you are performing stochastic modeling on this product, please list the scenario that triggers the largest present value loss (i.e., the greatest amount of death benefits paid in years in which no COI is collected.) If you are not currently using stochastic modeling, please list the deterministic tail scenario.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
1 year Treasury Rate										
7 year Treasury Rate										
30 year Treasury Rate										

	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
1 year Treasury Rate										
7 year Treasury Rate										
30 year Treasury Rate										

	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30
1 year Treasury Rate										
7 year Treasury Rate										
30 year Treasury Rate										

	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37	Year 38	Year 39	Year 40
1 year Treasury Rate										
7 year Treasury Rate										
30 year Treasury Rate										

2e. When you are measuring the risk on these secondary guarantees, what do you assume for critical risk variables (besides investment return discussed above), such as mortality rates?
Please describe below.

Question 3: LAPSE ASSUMPTIONS for Universal Life Secondary Guarantees

3a. Does your lapse assumption (when the policyholder chooses to terminate the contract, by a means other than death) vary for policies with and without these guarantees?

◯ Yes

□ No

3b. If so, please describe the dynamic lapse functions you are using for each product design with a secondary guarantee benefit on universal life policies.

[text input box]

Question 4: LAPSE RATES IN THE TAIL for Universal Life Secondary Guarantees

Please enter the lapse rate assumed in the tail scenario listed in Question 2d:

	Issue ages 20-29	Issue ages 30-39	Issue ages 40-49	Issue ages 50-59	Issue ages 60-69	Issue ages 70+
Year 1						
Year 2						
Year 3						
Last year with surrender charge						
End of surrender period						
First year after end of surrender charge period						
Last year before zero cash surrender value						
First year of zero cash surrender value						
For later years with zero cash surrender values						

Question 5: In the tail scenario listed in 2d., how many of 10,000 new policies issued in age groupings reach zero cash surrender value in the following durations but maintain coverage because of secondary guarantees?

	Issue ages under 20	Issue ages 20-29	Issue ages 30-39	Issue ages 40-49	Issue ages 50-59	Issue ages 60-69	Issue ages 70+
Durations 1-5	☐	☐	☐	☐	☐	☐	☐
Durations 6-10	☐	☐	☐	☐	☐	☐	☐
Durations 11-15	☐	☐	☐	☐	☐	☐	☐
Durations 16-20	☐	☐	☐	☐	☐	☐	☐
Durations 21-25	☐	☐	☐	☐	☐	☐	☐
Durations 26-30	☐	☐	☐	☐	☐	☐	☐
Durations 30+	☐	☐	☐	☐	☐	☐	☐

Question 6: LAPSE RATES BY DISTRIBUTION SYSTEM for UL Secondary Guarantee Benefits Benefits

If lapse rates vary by distribution system, please list the systems in the following four boxes. In addition, if they vary, please complete the table below with the appropriate lapse rates:

Distribution 1:

Distribution 2:

Distribution 3:

Distribution 4:

	Dist. #1	Dist. #2	Dist. #3	Dist. #4
Year 1	☐	☐	☐	☐

Year 2	☐	☐	☐	☐
Year 3	☐	☐	☐	☐
Last year with surrender charge	☐	☐	☐	☐
End of surrender period	☐	☐	☐	☐
First year after end of surrender charge period	☐	☐	☐	☐
Last year before zero cash surrender value	☐	☐	☐	☐
First year of zero cash surrender value	☐	☐	☐	☐
For later years with zero cash surrender values	☐	☐	☐	☐

Please identify any differences by issue ages and report below.

Question 7: LAPSE RATES BY MARKET for UL Secondary Guarantee Benefits

If lapses vary or are assumed to vary by market, describe the different markets in the boxes below. Then please complete the table below with the appropriate lapse rates. In addition, if they vary, please complete the table below with the appropriate lapse rates:

Market 1:

Market 2:

Market 3:

Market 4:

	Market #1	Market #2	Market #3	Market #4
Year 1	☐	☐	☐	☐
Year 2	☐	☐	☐	☐
Year 3	☐	☐	☐	☐
Last year with surrender charge	☐	☐	☐	☐
End of surrender period	☐	☐	☐	☐
First year after end of surrender charge period	☐	☐	☐	☐
Last year before zero cash surrender value	☐	☐	☐	☐
First year of zero cash surrender value	☐	☐	☐	☐
For later years with zero cash surrender values	☐	☐	☐	☐

Please identify any differences by issue ages and report below.

Question 8: SOURCES of Universal Life Secondary Guarantee Lapse Rate Assumptions

8a. What is the source of your assumptions? (e.g. company study, best guess)

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[                                   ]
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8b. Does your company perform lapse studies of this product and benefit?

○ Yes

○ No

8c. If so, how often?
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[                                   ]
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8d. If your company doesn't perform lapse studies of this product and benefit, does it contemplate doing so in the future?

○ Yes

○ No

8e. How many years of experience data were used in your latest study?
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[                                   ]
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Question 9: COMMENTS

Please add any additional explanatory comments or clarifications:

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[                                   ]
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Question 10:
Please provide us with a primary and secondary contact in case we need to follow-up with you on your submission.

Name   Telephone   Email

Primary

Secondary

Please contact jnallon@soa.org if you have any questions regarding this survey.

Enterprise Feedback Management Solution By Qualtrics Survey Software