Update on Development of New Payout Annuity Mortality Table

Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

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Progress To-Date

- Analyzed 2000-2004 payout annuity mortality experience
- Created a preliminary table, with confidence intervals at each age, through application of P-Splines for ages 50-94
  - Resulted in mortality rates higher than Annuity 2000 table for higher ages
- Graduated qxs from the data for males and females with confidence intervals
  - Method used provided a 95% confidence interval of graduation
  - Result with qxs generally ranging between 99-101% of the best estimate for key ages
  - Does not have a good fit at oldest and younger ages

Progress To-Date cont'd

- Analyzed mortality at younger and older ages
  - Mortality rates at these ages have little impact on the final reserve
  - Compared results to several existing industry tables:
    - 1994 GAM projected with Scale AA to 2000 and to 2002
    - 2008 VBT RR100
    - Annuity 2000
    - 2006 U.S. Life Tables

Progress To-Date cont'd

Younger age mortality comparison (experience by amount)

- 1994 GAM and A2000 table reasonably close at ages 20 and 35, significant divergence at 50
- Considering: population mortality at juvenile ages, A2000 or 1994 GAM with improvement for ages 25 to 50, grading to experience table projections between ages 50 and 65

	Age 20		Age 35		Age 50	
Table	Male	Female	Male	Female	Male	Female
2000-2004 study Qx/1000	N/A	N/A	N/A	N/A	6.11	4.11
Annuity 2000 Basic	0.55	0.28	0.79	0.52	3.33	1.71
AAA Initial Table	0.55	0.28	1.34	0.80	5.52	3.92
2008 Primary, NS	0.88	0.31	1.02	0.50	2.48	1.77
2005 Life Table	1.31	0.45	1.64	0.90	5.69	3.28
2006 SSA Table	1.34	0.46	1.67	0.90	5.66	3.28
1994 GAM Basic (@ 2000)	0.48	0.28	0.89	0.48	2.47	1.38

Progress To-Date cont'd

Higher age mortality comparison (experience by amount)

- 1994 GAM lower than population, Annuity 2000 rates significantly lower than population and more recent life experience table at highest ages for male risks
- Considering: experience table projections between ages 65 and 90 or 95, Kinnisto extension beyond, with a cap of 2008 VBT (with some level of improvement) and qx rate of 0.40.

	Age 90		Age 95		Age 99	
Table	Male	Female	Male	Female	Male	Female
2000-2004 study Qx/1000	135.37	100.77	198.95	166.14	229.90	338.56
Annuity 2000 Basic	124.61	112.76	180.24	174.49	233.37	233.03
AAA Initial Table	135.89	107.00	216.65	171.92	304.13	296.03
2008 Primary, NS	139.33	104.24	227.67	159.48	306.99	240.15
2005 Life Table	174.40	139.06	260.68	219.82	346.93	305.42
2006 SSA Table	177.64	138.94	277.94	226.89	354.02	299.72
1994 GAM Basic (@ 2000)	160.49	122.77	248.18	197.83	322.04	274.38
Kinnisto	133.20	105.84	210.96	174.79	286.78	246.73

Progress To-Date cont'd

Higher age mortality comparison – Ratio of Kinnisto to existing mortality tables

Table	Age 90		Age 95		Age 99	
	Male	Female	Male	Female	Male	Female
Annuity 2000 Basic	107%	94%	117%	100%	123%	106%
AAA Initial Table	98%	99%	97%	102%	94%	83%
2008 Primary, NS	96%	102%	93%	110%	93%	103%
2006 U.S. Life Table Total	79%	79%	83%	82%	85%	83%
2006 SSA Table	75%	76%	76%	77%	81%	82%
1994 GAM Basic (@ 2000)	83%	86%	85%	88%	89%	90%

Progress To-Date cont'd

Analyzed male and female data split by pension amount.

- Clear difference in experience based on pension amount
- Considered basing final table on lives with pension amounts of $2,500 or $5,000 and above but smaller amounts represent nearly 80% of deaths in study

Summary of 2000-04 Experience - Ratios to a2000 Basic

	Total		Immediate		Imm. & No Refund	
	Ratio	Deaths	Ratio	Deaths	Ratio	Deaths
All Contract Years						
<2,500	114%	53,438	114%	11,707	129%	1,739
2,500-4,999	104%	13,870	106%	5,425	100%	788
5,000-7,499	98%	6,076	99%	2,396	85%	416
7,500-9,999	96%	3,133	102%	1,236	80%	215
10-14K	93%	3,161	97%	1,281	63%	213
15-24K	89%	2,000	92%	778	61%	153
25-49K	82%	838	84%	354	55%	80
50+K	72%	182	59%	101	42%	32
Total	95%	82,698	93%	23,278	64%	3,636
Total w/o <2.5K	92%	29,260	90%	11,571	60%	1,897
Contract Years 1-10						
Total	90%	28,348	89%	12,162	55%	1,904
Total w/o <2.5K	89%	15,158	87%	7,380	53%	1,106
Contract Years 11+						
Total	101%	54,350	102%	10,935	94%	1,732
Total w/o <2.5K	96%	14,103	97%	4,010	89%	791

Table Development Considerations

- There is much uncertainty in the older and younger age data
  - The number of deaths we had at age 50 was pretty sparse
- Considering ultimate level of mortality = 0.40
- Suggesting to use:
  - Actual data up to age 95
  - Existing tables/mortality at younger ages (up to 50)
  - Actual data/smoothed from 60/65 to 95
  - Kinnisto extrapolation for older ages
    - Need to use another extrapolation method at older ages to get a good fit beyond age 95

Next Steps

- Continue to analyze male and female data split by pension amount.
  - There is a clear difference in experience based on pension amount
- Finalize younger and older age tables/rates and appropriate blending
- Analyze and determine mortality improvement/projection scale
  - Meeting with Social Security Administration, Human Mortality Database
- Review preliminary results from more recent (2005-2008) data call
  - More contributors, especially large annuity writers
- Proposed table with projection scale for October LHATF meeting

Guaranteed Issue/Simplified Issue Mortality Update

Industry Study

- Conducted industry study for guaranteed issue and simplified issue products in order to determine:
  - types of products;
  - underwriting and selection methods;
  - Distribution
- 133 contributing companies with 77 having some form of guaranteed issue/simplified issue business

– Pre-need	19 contributors
– Final expense	34 contributors
– Other markets	45 contributors
– Guaranteed issue	42 contributors
– Simplified issue	68 contributors

Industry Study

- Analyzed results from study to determine approach for conducting an industry mortality study/studies by Pre-need, final expense and all other
- Many factors impact mortality (& persistency) including:

Products	Marketing/Targeted solicitation
Application questions	Premium mode and method
Underwriting	Ancillary benefits
Market	Post-issue underwriting
Distribution	Death benefit pattern

Industry Study

- Proposing separate mortality studies for Pre-need and All Other distribution
- Many companies indicated uncertain whether willing to contribute data or were not willing to contribute

Next Steps

- Official charge from LHATF to conduct studies
  - Pre-need
  - Other GI/SI
- Develop data call
- Obtain statistical agent to assist with data collection and analysis