



2017 Guaranteed Issue Mortality Tables Report

Joint Academy of Actuaries' Life Experience Committee and Society of Actuaries' Preferred Mortality Oversight Group's Guaranteed Issue/Simplified Issue Working Group

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TABLE OF CONTENTS

Members of the Guaranteed Issue/Simplified Issue Working Group.....	3
1. Data Selection.....	4
1.1 Description of Underwriting.....	4
1.2 Background.....	4
1.3 Analysis of Data, including Limitations.....	4
1.4 Data Included in Study.....	5
2. Unloaded Mortality Table	6
2.1 Extent of Credible Data.....	6
2.2 Select Period and Other.....	6
2.3 Graduation Choices Made	6
2.4 Adjustments to Graduated Results	7
2.4.1 Adjustments for Ages 50 to 59	7
2.4.2 Adjustments for Ages 0 to 49	7
2.4.3 Adjustments for Ages 90-96	8
2.5 Extension for Ages 97-120.....	8
2.6 Interpolation, Adjustments and Slope Checks.....	8
2.7 Mortality Improvement	9
2.8 2017 Unloaded GI S&U ALB Mortality Tables.....	9
3. Loaded Mortality Table	10
3.1 Scatter Diagram.....	10
3.2 Coverage for Various Loadings	10
3.3 Valuation and Nonforfeiture Recommendations	10
3.4 Final Loading.....	11
3.5 Slope Checks.....	11
3.6 Loaded Gender-Blended Mortality Tables.....	12
3.7 Model Office Reserves and Graph	12
Appendix A. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Male Mortality Table, ALB.....	14
Appendix B. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Female Mortality Table, ALB	16
Appendix C. 2017 Guaranteed Issue Composite Ultimate Mortality Tables.....	18
Appendix D. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ALB	20
Appendix E. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ANB	22

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1. Data Selection

1.1 Description of Underwriting

A data call was issued on March 11, 2011 for guaranteed issue, simplified issue and preneed mortality data for observation years 2005 to 2009. Preneed business written on a guaranteed issue basis was included in the preneed study and not in the guaranteed issue study.

For purposes of this study, a guaranteed issue (GI) policy was defined as a policy or certificate where the applicant must be accepted for coverage if the applicant is eligible and the premium is paid. Exceptions for not allowing coverage including ineligibility due to issue age ranges or lack of membership in the eligible group (e.g., association group) will not disqualify the policy or certificate from being considered guaranteed. If any of the following risk selection criteria are required, then the coverage should not be considered guaranteed issue:

- Actively at work requirement.
- Acceptance based on any health related questions or information.
- Waiving of underwriting requirements based on minimum participation thresholds, such as for worksite marketing.

1.2 Background

The SOA hired MIB to compile the data collected for the guaranteed issue study. MIB performed numerous syntax and validation checks and worked with SOA staff to ensure that company confidentiality was protected in the production of any data views that were provided to the Joint American Academy of Actuaries Life Experience Committee and Society of Actuaries Preferred Mortality Oversight Group (POG) for the development of the mortality tables.

The SOA's confidentiality guidelines state that any data released for analysis should not have any one company dominating the experience data. To meet this guideline, some companies' data submissions had to be scaled down. The guidelines also state that any potential subset or extract of the data should contain multiple companies' experience in order to prevent the identification of any one company's experience.

Because the guaranteed issue business is not homogenous in term of the combination of factors (i.e. distribution channel, distribution method, premium payment method, etc.) that were collected to describe the business, the data released to the POG was very limited in terms of the number of factors the could be analyzed in combination. For example, the factors of distribution channel and distribution method could not be provided in the same view of the data because at least one of the combinations of distribution channel and distribution method resulted in a data cell with only one or two companies' experience.

1.3 Analysis of Data, including Limitations

The study included data from 15 companies. The initial analysis focused on the results based on the smoking status of the submitted (non-smoker, smoker or unismoke). There were clear differences in the

mortality results based on smoking status. Mortality ratios were calculated based on the 2008 Valuation Basic Table for Limited Underwriting (“VBTLU”) Ultimate Table, whose rates that vary by nonsmoker, smoker and unismoker. The results were as follows:

- 84.3% for no tobacco/nonsmoker risks
- 77.9% for tobacco/smoker risks
- 181.4% for unismoker or composite risks (i.e., not differentiated between nonsmoker and smoker risks)

Due to the constraints on the data made available to the committee described above, other business characteristics could not be analyzed directly when further split by smoking status. Rather, analysis was done based on face amount, which could be used for all business characteristics. 99% of data not coded as smoker distinct was for face amounts below \$25,000, and 83% of data coded as smoker distinct was for face amounts of \$25,000 or above. Using face amount as the basis for splitting the data, it was found that:

By distribution channel:

- Below 25 units: 96% direct marketing
- 25 units and higher: 96% independent agents/brokers

By death benefit pattern,

- Below 25 units: 98% modified death benefit (having an initial limited death benefit for a number of years before reaching the ultimate amount)
- 25 units and higher: 4% modified death benefit

Due to the substantial differences in the mortality levels of the data based on smoker status, and the differences in product characteristics seen when splitting the business based on face amount, it was decided that the development of a guaranteed issue mortality table would exclude all data coded as non-smoker or smoker. As a result of this decision, the study largely consisted of risks with the following characteristics; the results of this study may not be applicable to business with other characteristics.

- Face amounts under \$25,000,
- Sold through direct marketing,
- And providing modified death benefits in the first two policy years.

1.4 Data Included in Study

The following table shows totals for data collected, data excluded and data included in the study, where the data excluded is that coded as either non-smoker or smoker:

	Guaranteed Issue data				Average Mortality Rate	
	Death Count	Death Units	Exposure Count	Exposure Units	By Count	By Amount
Data Collected	216,868	1,397,847	4,868,865	35,308,560	0.04454	0.03959
Data Excluded	2,447	58,230	110,943	4,126,970	0.02206	0.01411
Data Included	214,422	1,339,617	4,757,922	31,181,590	0.04507	0.04296
Included/Collected	98.9%	95.8%	97.7%	88.3%	101.2%	108.5%

2. Unloaded Mortality Table

2.1 Extent of Credible Data

The study included over 214,000 deaths. 99.5% of the exposure by units was for issue ages 45-84.

2.2 Select Period and Other

Using the ungraduated experience data on an attained age basis as the basis for expected mortality, mortality ratios were examined by duration. A declining mortality ratio by duration, indicating anti-selection, was found, as shown below:

Duration	Deaths in units	Mortality ratio
1	171,232	114.5%
2	133,850	104.1%
3	125,393	102.7%
4	116,756	99.0%
5	98,376	97.8%
6-10	359,166	96.8%
11-15	243,096	95.8%
16-20	87,230	94.6%
21 & above	4,518	117.2%
Total	1,339,617	100.0%

The pattern of anti-selection is observable, but not pronounced after the first year. A five year select period was chosen for purposes of developing a select and ultimate (“S&U”) experience table. An ultimate-only experience table was created using the ultimate rates from the S&U experience table, which were based on experience in durations six and later.

All data was submitted on a sex distinct basis, with 63.5% by unit on female lives. Separate tables were developed for males and females.

The tables were developed on an age last birthday (“ALB”) basis.

2.3 Graduation Choices Made

Three separate graduations were performed, all based on units of death and units of exposure. Select mortality for durations 1-5 was graduated for issue ages 50 to 85. Ultimate mortality (durations 6 and above combined by attained age) was graduated for attained ages 50 to 90. Aggregate mortality for all durations combined was graduated for ages 30 to 95. For all graduations, Whitaker-Henderson graduation was performed using graduation functions obtained from Bob Howard’s WHGradSample.xls workbook, available on-line. Exposure was used as the weights for the graduation, thereby ensuring that the graduated rates would reproduce total units of death benefits.

For the select rates, both males and females, issue ages 60 to 85, the rates from the graduation were subjected to the adjustments described below in the slope checks section.

For the attained age rates for ages 58 to 90, the rates from the graduation were subjected to the adjustments described below in the adjustments for older ages and the slope checks sections.

2.4 Adjustments to Graduated Results

2.4.1 Adjustments for Ages 50 to 59

For males issue age 50-59, durations 1 to 5, the graduated results were replaced with flat multiples (select factors) of the original attained age rates. The multiple in duration 1 was 112.2%, which was the average of the duration 1 multiple for issue ages 60 to 64. The multiples for durations 2-5 were as follows:

- 2 107.1%
- 3 102.1
- 4 99.9
- 5 95.9

These were set to provide fairly uniform grading.

For male attained ages 50 to 57, a multiple of the aggregate rate (87% to 88%, varying slightly by age) was used to replace the graduated attained age rate.

For female issue ages 50 to 59, durations 1 to 5, the results of the graduation were replaced with smoothed select factors. These were not level as for males, but instead followed the pattern of the graduated results and served to dampen the range of the select factors before adjustment.

For female attained ages 50 to 57, the same multiple of the aggregate rates used for males was applied to the female aggregate rates to replace the female graduated attained age rates.

These adjustments were made because the W-H graduation produced wide swings in the select factors at the younger end of the ages graduated (i.e., issue ages 50 to 59), as well as at the tail of the younger end of the attained age rates (i.e., attained ages 50 to 57). There was a small but similar effect at the older issue ages (80 to 85), but much less pronounced, so no adjustment was made there.

2.4.2 Adjustments for Ages 0 to 49

Select ratios for GI issue age 50 S&U rates to the Preneed ultimate rates for the same attained ages were calculated for females and males. Assuming that the same pattern of select rates applied to younger ages, GI S&U rates for issue ages 0 to 49 were obtained by multiplying Preneed ultimate rates for the corresponding attained age by the select ratios shown in the following table:

Select Ratios of GI Select and Ultimate Rates to Preneed Ultimate Rates

Duration:	Issue Age 50					Attained Age 55
	1	2	3	4	5	
Female ratios:	188.5%	178.9%	171.6%	165.1%	158.1%	138.1%
Male ratios:	214.4%	199.0%	184.8%	179.9%	172.7%	157.1%

2.4.3 Adjustments for Ages 90-96

Because of the similarity of GI and Preneed rates at the oldest ages, it was decided to grade from the oldest credible GI rate, at attained age 90, to the oldest credible Preneed rate, at attained age 96. This was accomplished by the following steps:

- The ratio of the graduated GI attained age 90 mortality rate to the corresponding Preneed attained age 90 mortality rate was calculated for both females and males. The female ratio at age 90 was 98.38% and the male ratio was 107.95%.
- These ratios were linearly graded to 100% over six years, from attained age 90 to 96.
- The resulting ratios were applied to Preneed rates for attained ages 90 to 96 to produce GI rates for attained ages 90 to 96.

2.5 Extension for Ages 97-120

GI rates for attained ages 97 and higher were calculated using a multi-step process that linked the progression of mortality rates to that for the 2015 VBT table that underlies the 2017 CSO table:

- The GI mortality rate at age 96 was based on the 2015 Preneed age 96 rate, as described in the previous section.
- The GI mortality rate for age 110 was set equal to 0.5, the maximum mortality rate achieved by the 2015 VBT table at age 112. In other words, it was assumed that GI lives would reach the highest mortality rate of 0.5000 two years earlier than fully underwritten lives.
- The annual increase in mortality rates for the 2015 VBT table were calculated for ages 97 to 110.
- The annual increase in GI mortality rates was set equal to the 2015 VBT annual increase for the same age, minus a constant X.
- X was solved for to reproduce the GI mortality rate at age 96.

2.6 Interpolation, Adjustments and Slope Checks

Rates were graduated by individual issue ages 50 to 85, so there was no need for interpolation. Similarly, rates for issue ages 0-49, attained ages 5-54 and attained ages 91+ were all calculated as ratios to Preneed rates, so no interpolation was needed.

For male and female attained ages 7-11, there were a number of local minima and local maxima among rates that were almost equal to one another. This anomaly was corrected by sorting the rates into descending order within each select year and within ultimate.

A similar problem was found for female attained ages 46-54 and was corrected in the same fashion.

Three kinds of slope checks were made, with ultimate rates treated as policy year 6. Slopes were checked:

- Between rates for adjacent issue ages for the same policy year:
 - Rates monotonically decreased to a minimum at attained age 32 for both males and females and all select years and then monotonically increased thereafter.
- Between rates for adjacent durations for the same issue age:
 - Other than the exceptions noted below, rates showed an anti-select pattern through issue age 61, with rates monotonically decreasing by policy year. The exceptions were for female issue ages 35-41 and 55-61 and males issue ages 31-49, where rates were almost equal to one another but varied up and down. For males 58-70, select mortality rates hit

a minimum between policy years 2-4 and then began increasing, reflecting an increasingly shorter anti-select period as issue age increased.

- Between rates for the same attained age but with issue age and policy year differing by 1 and -1 or -1 and 1:
 - At virtually all constant attained ages, mortality decreased with increasing policy year. There were minor exceptions at the oldest issue ages where the ultimate rate was sometimes slightly larger than the policy year 5 rate for the same attained age.

2.7 Mortality Improvement

The table below shows the overall mortality ratio for each study year. The last study year, 2009, had a considerable increase in the number of deaths, nearly all attributable to the experience of one contributor. In the view of the subcommittee, the trend over the four remaining homogenous years did not show a pattern of mortality improvement large enough to project ongoing improvement from the period of the study to the publication date of the final table.

Study year	No. of deaths	A/E using S&U GI Table
2005	40,996	102.2%
2006	40,501	99.8%
2007	39,950	99.3%
2008	40,568	101.8%
2009	51,633	98.5%

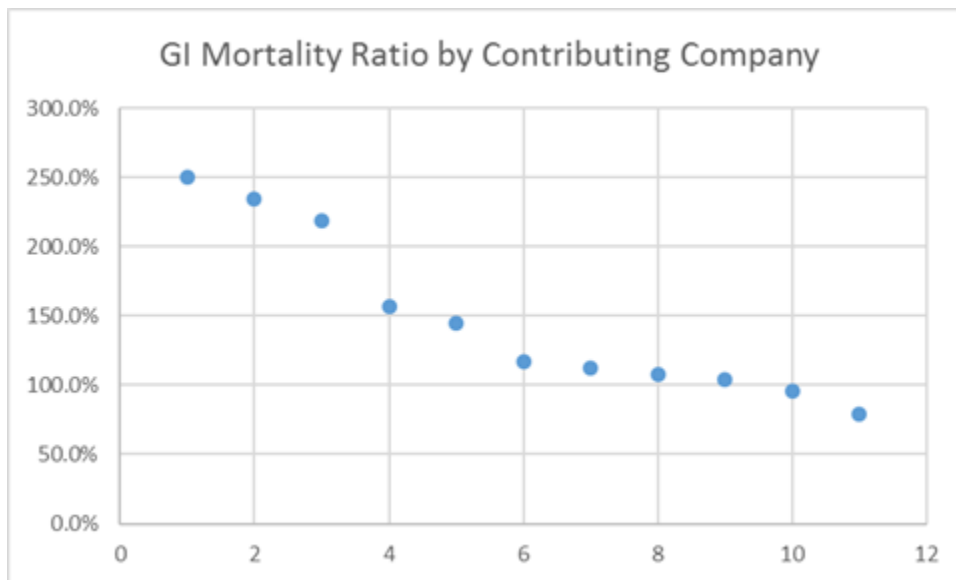
2.8 2017 Unloaded GI S&U ALB Mortality Tables

2017 Unloaded GI Composite ALB mortality tables for males and females were developed on a five-year select and ultimate basis. Separate 2017 Unloaded GI Composite Ultimate ALB mortality tables for males and females were created from the ultimate rates of the S&U tables. The 2017 Unloaded GI Composite ALB mortality tables, which are select and ultimate, are shown in Appendices A (Male) and B (Female). The 2017 Unloaded GI Composite Ultimate ALB mortality tables are shown in Appendix C.

3. Loaded Mortality Table

3.1 Scatter Diagram

Mortality ratios as a percentage of the 2017 Unloaded GI S&U ALB mortality table varied significantly by contributing company, as shown in the scatter diagram below. Mortality ratios as a percentage of the 2017 Unloaded GI Ultimate ALB mortality table (not shown) were generally about 4% higher. While a 2017 CSO level of loading, which averaged about 17%, applied to the S&U table would cover companies constituting 98.8% of the study's exposure, it would cover only 55% percent of the contributing companies.



3.2 Coverage for Various Loadings

The 2017 CSO level of loading, which averaged about 17%, covered only 6 of the 11 contributing companies, for a coverage level of 55%

- A 45% load would cover one additional company, bringing coverage to 64%
- A 57% load would cover two additional companies, bringing coverage to 73%
- A 219% load would cover three additional companies, bringing coverage to 82%

3.3 Valuation and Nonforfeiture Recommendations

The 2017 Unloaded GI Ultimate ALB table with 2017 CSO loading (the 2017 Loaded GI Ultimate ALB table) was recommended for valuation purposes for the following reasons:

- The resulting model office reserves were more conservative than those from the 2017 Unloaded GI S&U ALB table with 2017 CSO loading (the 2017 GI Loaded S&U ALB table).
- It reflected mortality levels in line with GI mortality experience, while 2017 CSO mortality was far lower than GI mortality experience.

- It seemed to produce a present value of reserve increases similar to those produced by the 2017 CSO table.

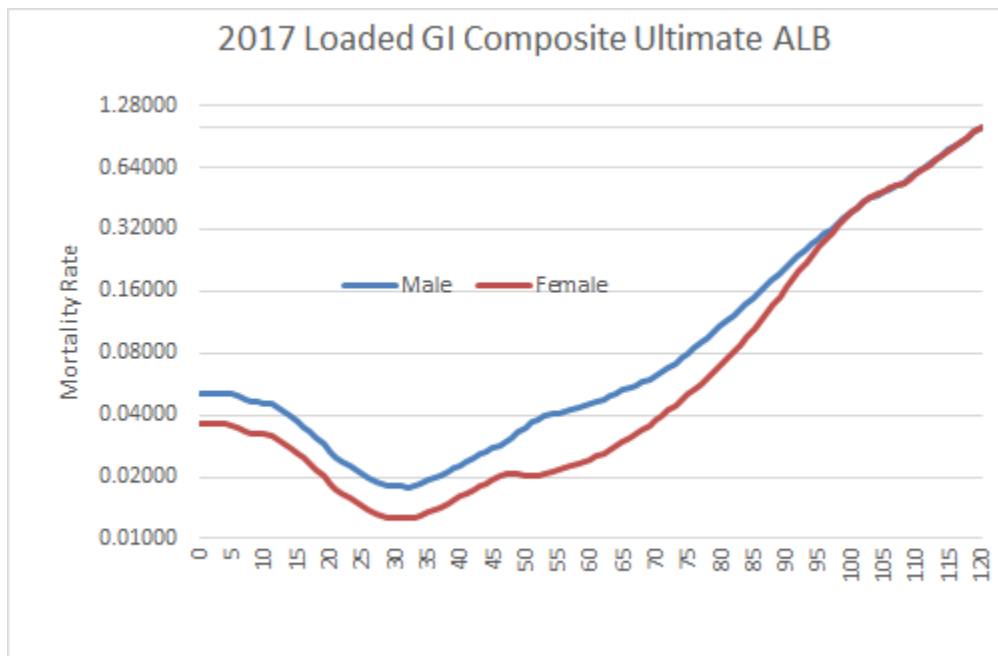
3.4 Final Loading

The 2017 Loaded GI Ultimate ALB and ANB tables were created by applying 2017 CSO Loading factors in the following manner:

- When mortality ratios to the 2017 Unloaded GI S&U ALB table were analyzed by observation year, a 5-year (2005 to 2009) least squares fit yielded an annual improvement rate of 0.5%. However, the 4-year (2006 to 2009) result yielded an annual improvement rate of 0.1%. Therefore, no mortality improvement was recommended or applied.
- The 2017 Unloaded GI Ultimate ALB table was converted to ANB to create the 2017 Unloaded GI Ultimate ANB table.
- 2017 CSO Loading factors, which are ANB only, were applied to the 2017 Unloaded GI Ultimate ANB table to create the 2017 Loaded GI Ultimate ANB table, subject to the results being no less than the 2017 CSO Loaded Ultimate ANB table, thereby grading mortality rates to 1.0 by age 120.
- The 2017 Loaded GI Ultimate ANB table was converted to ALB to create the 2017 GI Ultimate ALB table, subject to the results being no less than the 2017 CSO Loaded Ultimate ALB table, thereby grading mortality rates to 1.0 by age 120.

The loaded and unloaded, ALB and ANB, ultimate tables, mentioned above, can be found in Appendix C.

The following graph illustrates the 2017 Loaded GI Ultimate ALB rates:



3.5 Slope Checks

The slope of the 2017 Loaded GI Ultimate table was examined with the following results: Rates were flat from age 0 to age 10 and then monotonically decreased to age 32, after which rates monotonically increased to age 120.

3.6 Loaded Gender-Blended Mortality Tables

The following gender-blended versions of the 2017 Loaded GI Ultimate ALB and ANB tables were developed. Loaded ALB tables are shown in Appendix D and loaded ANB tables can be found in Appendix E.

- 100% Male, 0% Female (i.e., Male)
- 80% Male, 20% Female
- 60% Male, 40% Female
- 50% Male, 50% Female
- 40% Male, 60% Female
- 20% Male, 80% Female
- 0% Male, 100% Female (i.e., Female)

3.7 Model Office Reserves and Graph

A model office was constructed and used to compare reserves based on three tables:

- 2001 CSO,
- 2017 GI Select and Ultimate (“S&U”) with 2017 CSO loading and
- 2017 GI Ultimate with 2017 CSO Loading

Mean reserves were projected for 45 years using a single year of issue with a distribution by issue age group and sex from the study data, persistency from the study as developed by LIMRA, and reserves determined using the 2017 Loaded GI Composite Ultimate ALB table, a preliminary (unpublished) 2017 Loaded GI Composite ALB table and the 2001 CSO Ultimate ALB table.

The results for mean reserves were consistent:

- The 2017 Loaded GI Ultimate table produced the highest mean reserves.
- The 2017 Loaded GI table produced the second highest mean reserves.
- The 2001 CSO Ultimate table produced the lowest mean reserves through the first fifteen years, and all three tables had similar mean reserves after 15 years.

The results for mid-terminal reserves differed:

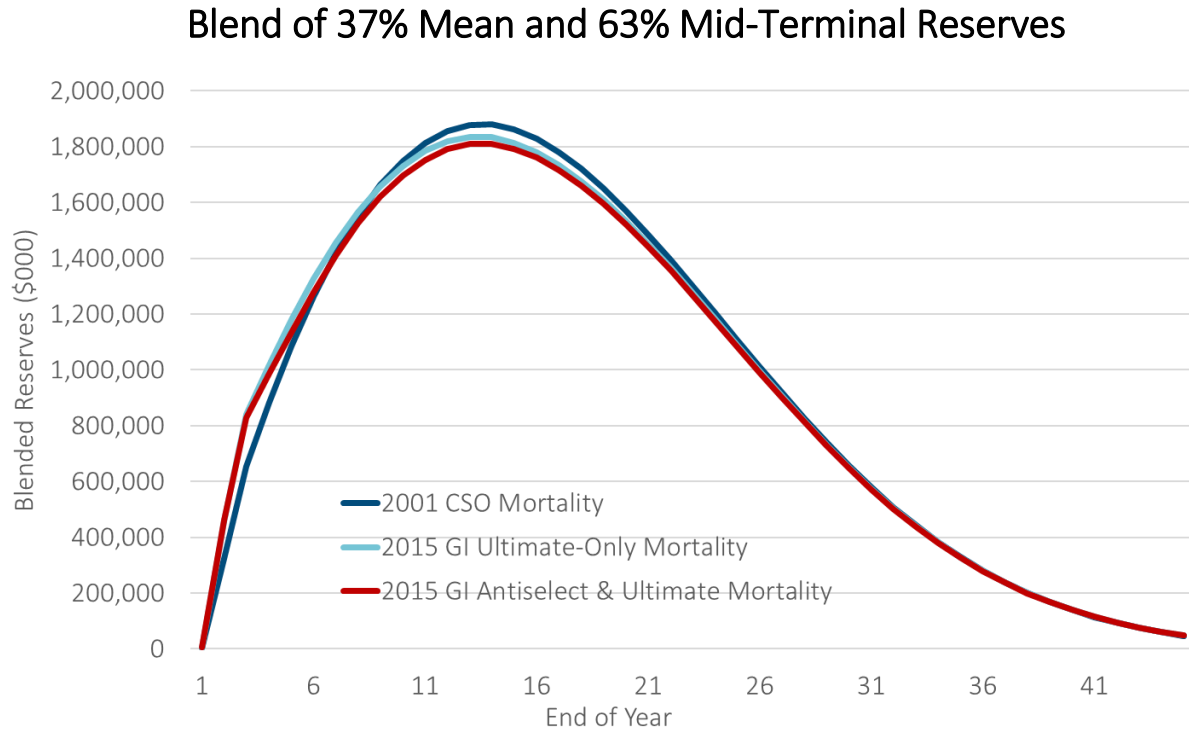
- The 2017 Loaded GI Ultimate table produced the highest mid-terminal reserves through year 7.
- The 2001 CSO Ultimate table produced the highest mid-terminal reserves thereafter, although all three sets of reserves were almost identical after 30 years.

A blend of 37% mean reserves and 63% mid-terminal reserves (to approximate reserves for the overall mix of annual, semiannual, quarterly and monthly premiums) produced a more meaningful comparison with the following results:

- The 2017 Loaded GI Ultimate table produced the highest reserves through year 8.
- The 2001 CSO Ultimate produced the highest reserves thereafter, although all three sets of reserves were almost identical after 30 years.

- While the pattern was similar to that of the mid-terminal results, the differences between the reserves produced by the different tables were much smaller.

The following graph shows the blended results. It would appear that the present value of reserve increases would be similar for the 2017 Loaded GI Ultimate table and the 2001 CSO Ultimate table.



A comparison to reserves produced by the 2017 CSO Ultimate table was also made. The 2017 Loaded GI Ultimate table produced higher reserves through year 7 while the 2017 CSO Ultimate table produced higher reserves thereafter.

Appendix A. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Male Mortality Table, ALB

Issue Age	Duration:					Ultimate 6+	Attained Age
	1	2	3	4	5		
0	0.05694	0.05284	0.04908	0.04778	0.04586	0.04172	5
1	0.05694	0.05284	0.04908	0.04778	0.04586	0.04027	6
2	0.05694	0.05284	0.04908	0.04778	0.04426	0.03809	7
3	0.05694	0.05284	0.04908	0.04612	0.04187	0.03756	8
4	0.05694	0.05284	0.04737	0.04363	0.04129	0.03754	9
5	0.05694	0.05099	0.04481	0.04302	0.04127	0.03724	10
6	0.05496	0.04824	0.04419	0.04300	0.04093	0.03702	11
7	0.05199	0.04757	0.04417	0.04265	0.04070	0.03544	12
8	0.05127	0.04755	0.04381	0.04240	0.03896	0.03364	13
9	0.05124	0.04716	0.04356	0.04059	0.03698	0.03185	14
10	0.05082	0.04689	0.04170	0.03853	0.03501	0.03011	15
11	0.05053	0.04488	0.03958	0.03647	0.03310	0.02841	16
12	0.04837	0.04261	0.03747	0.03448	0.03123	0.02671	17
13	0.04592	0.04033	0.03542	0.03254	0.02936	0.02501	18
14	0.04347	0.03813	0.03342	0.03059	0.02749	0.02331	19
15	0.04109	0.03598	0.03142	0.02864	0.02562	0.02161	20
16	0.03877	0.03382	0.02942	0.02669	0.02375	0.02003	21
17	0.03645	0.03167	0.02742	0.02474	0.02202	0.01927	22
18	0.03413	0.02952	0.02542	0.02294	0.02118	0.01850	23
19	0.03181	0.02736	0.02357	0.02207	0.02033	0.01773	24
20	0.02949	0.02537	0.02267	0.02119	0.01949	0.01696	25
21	0.02734	0.02440	0.02176	0.02031	0.01865	0.01619	26
22	0.02629	0.02343	0.02086	0.01943	0.01780	0.01543	27
23	0.02525	0.02245	0.01996	0.01855	0.01696	0.01505	28
24	0.02420	0.02148	0.01905	0.01767	0.01654	0.01493	29
25	0.02315	0.02051	0.01815	0.01723	0.01641	0.01481	30
26	0.02210	0.01954	0.01770	0.01709	0.01627	0.01468	31
27	0.02105	0.01905	0.01756	0.01696	0.01614	0.01456	32
28	0.02054	0.01890	0.01742	0.01682	0.01601	0.01486	33
29	0.02037	0.01875	0.01728	0.01668	0.01633	0.01533	34
30	0.02021	0.01860	0.01713	0.01702	0.01685	0.01579	35
31	0.02004	0.01844	0.01748	0.01755	0.01736	0.01626	36
32	0.01988	0.01882	0.01803	0.01809	0.01788	0.01673	37
33	0.02028	0.01941	0.01858	0.01863	0.01839	0.01742	38
34	0.02092	0.02000	0.01913	0.01916	0.01915	0.01818	39
35	0.02156	0.02060	0.01968	0.01995	0.01998	0.01893	40
36	0.02220	0.02119	0.02049	0.02082	0.02081	0.01969	41
37	0.02284	0.02206	0.02138	0.02169	0.02165	0.02045	42
38	0.02377	0.02302	0.02228	0.02256	0.02248	0.02127	43
39	0.02481	0.02398	0.02317	0.02342	0.02339	0.02212	44
40	0.02584	0.02494	0.02406	0.02436	0.02432	0.02297	45
41	0.02688	0.02590	0.02503	0.02533	0.02525	0.02381	46
42	0.02791	0.02694	0.02602	0.02630	0.02618	0.02466	47
43	0.02903	0.02801	0.02702	0.02728	0.02711	0.02604	48
44	0.03019	0.02909	0.02802	0.02825	0.02862	0.02757	49
45	0.03135	0.03016	0.02901	0.02982	0.03031	0.02911	50
46	0.03250	0.03123	0.03063	0.03158	0.03200	0.03065	51
47	0.03366	0.03298	0.03244	0.03334	0.03369	0.03218	52
48	0.03554	0.03492	0.03425	0.03510	0.03538	0.03307	53
49	0.03763	0.03687	0.03605	0.03686	0.03635	0.03371	54
50	0.03973	0.03881	0.03787	0.03786	0.03706	0.03436	55
51	0.04066	0.03971	0.03869	0.03863	0.03772	0.03492	56
52	0.04160	0.04058	0.03946	0.03932	0.03831	0.03552	57
53	0.04251	0.04139	0.04017	0.03994	0.03884	0.03634	58
54	0.04337	0.04213	0.04080	0.04049	0.03934	0.03716	59
55	0.04414	0.04280	0.04136	0.04101	0.03983	0.03809	60
56	0.04484	0.04339	0.04189	0.04152	0.04035	0.03914	61
57	0.04545	0.04394	0.04241	0.04206	0.04092	0.04032	62
58	0.04604	0.04449	0.04296	0.04266	0.04158	0.04160	63
59	0.04661	0.04507	0.04358	0.04325	0.04236	0.04296	64
60	0.04828	0.04526	0.04415	0.04335	0.04309	0.04440	65

Appendix A. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Male Mortality Table, ALB

Issue Age	Duration:					Ultimate 6+	Attained Age
	1	2	3	4	5		
61	0.04831	0.04538	0.04487	0.04414	0.04359	0.04589	66
62	0.04860	0.04572	0.04553	0.04502	0.04430	0.04744	67
63	0.04877	0.04636	0.04621	0.04600	0.04542	0.04910	68
64	0.04969	0.04740	0.04709	0.04706	0.04722	0.05092	69
65	0.05101	0.04888	0.04825	0.04885	0.04935	0.05295	70
66	0.05266	0.05078	0.04990	0.05096	0.05213	0.05527	71
67	0.05459	0.05308	0.05206	0.05352	0.05529	0.05794	72
68	0.05677	0.05570	0.05472	0.05648	0.05871	0.06099	73
69	0.05917	0.05857	0.05780	0.05973	0.06230	0.06446	74
70	0.06174	0.06158	0.06121	0.06320	0.06602	0.06835	75
71	0.06439	0.06464	0.06477	0.06684	0.06987	0.07262	76
72	0.06703	0.06768	0.06837	0.07062	0.07393	0.07726	77
73	0.06968	0.07067	0.07196	0.07461	0.07830	0.08224	78
74	0.07245	0.07369	0.07561	0.07885	0.08304	0.08754	79
75	0.07546	0.07685	0.07942	0.08340	0.08816	0.09318	80
76	0.07877	0.08031	0.08353	0.08828	0.09362	0.09916	81
77	0.08245	0.08426	0.08808	0.09349	0.09933	0.10553	82
78	0.08665	0.08891	0.09320	0.09905	0.10523	0.11235	83
79	0.09162	0.09446	0.09902	0.10501	0.11127	0.11970	84
80	0.09769	0.10103	0.10560	0.11138	0.11741	0.12771	85
81	0.10509	0.10864	0.11292	0.11814	0.12363	0.13650	86
82	0.11396	0.11724	0.12093	0.12527	0.12990	0.14626	87
83	0.12434	0.12674	0.12949	0.13270	0.13620	0.15714	88
84	0.13620	0.13703	0.13848	0.14034	0.14249	0.16935	89
85	0.14952	0.14800	0.14779	0.14811	0.14873	0.18308	90
						0.19641	91
						0.21006	92
						0.22390	93
						0.23779	94
						0.25162	95
						0.26524	96
						0.28363	97
						0.30354	98
						0.32449	99
						0.34598	100
						0.36757	101
						0.38881	102
						0.40927	103
						0.42856	104
						0.44630	105
						0.46213	106
						0.47572	107
						0.48675	108
						0.49493	109
						0.50000	110
						0.50000	111
						0.50000	112
						0.50000	113
						0.50000	114
						0.50000	115
						0.50000	116
						0.50000	117
						0.50000	118
						0.50000	119
						0.50000	120

Appendix B. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Female Mortality Table, ALB

Issue Age	Duration:					Ultimate 6+	Attained Age
	1	2	3	4	5		
0	0.03989	0.03786	0.03630	0.03494	0.03344	0.02922	5
1	0.03989	0.03786	0.03630	0.03494	0.03344	0.02821	6
2	0.03989	0.03786	0.03630	0.03494	0.03229	0.02668	7
3	0.03989	0.03786	0.03630	0.03373	0.03054	0.02632	8
4	0.03989	0.03786	0.03505	0.03190	0.03013	0.02630	9
5	0.03989	0.03655	0.03314	0.03147	0.03011	0.02608	10
6	0.03851	0.03457	0.03270	0.03145	0.02986	0.02593	11
7	0.03642	0.03410	0.03268	0.03119	0.02968	0.02482	12
8	0.03593	0.03408	0.03241	0.03101	0.02842	0.02356	13
9	0.03591	0.03380	0.03222	0.02969	0.02698	0.02231	14
10	0.03561	0.03360	0.03084	0.02818	0.02554	0.02109	15
11	0.03540	0.03217	0.02928	0.02668	0.02414	0.01990	16
12	0.03389	0.03054	0.02772	0.02522	0.02278	0.01871	17
13	0.03217	0.02890	0.02620	0.02380	0.02141	0.01752	18
14	0.03045	0.02733	0.02472	0.02237	0.02005	0.01632	19
15	0.02879	0.02578	0.02324	0.02095	0.01869	0.01513	20
16	0.02717	0.02424	0.02176	0.01952	0.01732	0.01403	21
17	0.02554	0.02270	0.02028	0.01810	0.01606	0.01349	22
18	0.02391	0.02115	0.01880	0.01678	0.01545	0.01296	23
19	0.02229	0.01961	0.01744	0.01614	0.01483	0.01242	24
20	0.02066	0.01818	0.01677	0.01549	0.01422	0.01188	25
21	0.01916	0.01749	0.01610	0.01485	0.01360	0.01134	26
22	0.01842	0.01679	0.01543	0.01421	0.01298	0.01080	27
23	0.01769	0.01609	0.01476	0.01356	0.01237	0.01054	28
24	0.01695	0.01540	0.01409	0.01292	0.01206	0.01045	29
25	0.01622	0.01470	0.01343	0.01260	0.01197	0.01037	30
26	0.01549	0.01400	0.01309	0.01250	0.01187	0.01029	31
27	0.01475	0.01366	0.01299	0.01240	0.01177	0.01020	32
28	0.01439	0.01355	0.01288	0.01230	0.01168	0.01041	33
29	0.01427	0.01344	0.01278	0.01220	0.01191	0.01074	34
30	0.01416	0.01333	0.01267	0.01245	0.01229	0.01106	35
31	0.01404	0.01322	0.01293	0.01284	0.01266	0.01139	36
32	0.01393	0.01349	0.01334	0.01323	0.01304	0.01172	37
33	0.01421	0.01391	0.01375	0.01362	0.01342	0.01220	38
34	0.01466	0.01434	0.01415	0.01401	0.01396	0.01273	39
35	0.01510	0.01476	0.01456	0.01459	0.01457	0.01326	40
36	0.01555	0.01519	0.01516	0.01522	0.01518	0.01379	41
37	0.01600	0.01581	0.01582	0.01586	0.01579	0.01433	42
38	0.01666	0.01650	0.01648	0.01650	0.01640	0.01490	43
39	0.01738	0.01719	0.01714	0.01713	0.01706	0.01549	44
40	0.01811	0.01787	0.01780	0.01782	0.01774	0.01609	45
41	0.01883	0.01856	0.01851	0.01853	0.01842	0.01668	46
42	0.01956	0.01931	0.01925	0.01924	0.01909	0.01680	47
43	0.02034	0.02008	0.01999	0.01995	0.01924	0.01693	48
44	0.02115	0.02085	0.02073	0.02010	0.01938	0.01706	49
45	0.02196	0.02161	0.02088	0.02025	0.01953	0.01716	50
46	0.02277	0.02184	0.02090	0.02040	0.01964	0.01719	51
47	0.02299	0.02186	0.02102	0.02052	0.01967	0.01727	52
48	0.02301	0.02194	0.02104	0.02055	0.01977	0.01731	53
49	0.02309	0.02198	0.02120	0.02063	0.01982	0.01769	54
50	0.02314	0.02210	0.02121	0.02066	0.02025	0.01822	55
51	0.02329	0.02218	0.02135	0.02070	0.02043	0.01847	56
52	0.02335	0.02227	0.02146	0.02082	0.02071	0.01883	57
53	0.02346	0.02238	0.02149	0.02110	0.02104	0.01923	58
54	0.02358	0.02243	0.02151	0.02144	0.02142	0.01979	59
55	0.02364	0.02248	0.02184	0.02183	0.02185	0.02044	60
56	0.02366	0.02284	0.02224	0.02227	0.02232	0.02119	61
57	0.02404	0.02326	0.02268	0.02275	0.02284	0.02203	62
58	0.02448	0.02372	0.02317	0.02328	0.02342	0.02295	63
59	0.02497	0.02423	0.02371	0.02386	0.02406	0.02394	64
60	0.02537	0.02534	0.02548	0.02555	0.02567	0.02502	65

Appendix B. 2017 Unloaded Guaranteed Issue, Select and Ultimate, Composite Female Mortality Table, ALB

Issue Age	Duration:					Ultimate 6+	Attained Age
	1	2	3	4	5		
61	0.02541	0.02557	0.02583	0.02597	0.02622	0.02618	66
62	0.02569	0.02588	0.02624	0.02652	0.02693	0.02743	67
63	0.02620	0.02637	0.02682	0.02731	0.02791	0.02879	68
64	0.02690	0.02712	0.02769	0.02842	0.02925	0.03027	69
65	0.02777	0.02816	0.02893	0.02987	0.03095	0.03190	70
66	0.02882	0.02951	0.03053	0.03164	0.03293	0.03370	71
67	0.03010	0.03114	0.03244	0.03366	0.03512	0.03568	72
68	0.03169	0.03302	0.03456	0.03587	0.03746	0.03787	73
69	0.03360	0.03510	0.03683	0.03823	0.03993	0.04028	74
70	0.03581	0.03732	0.03918	0.04068	0.04258	0.04292	75
71	0.03816	0.03958	0.04158	0.04322	0.04541	0.04580	76
72	0.04050	0.04187	0.04402	0.04588	0.04844	0.04893	77
73	0.04277	0.04421	0.04655	0.04875	0.05166	0.05233	78
74	0.04503	0.04667	0.04926	0.05189	0.05513	0.05605	79
75	0.04744	0.04937	0.05225	0.05537	0.05887	0.06014	80
76	0.05018	0.05243	0.05558	0.05919	0.06296	0.06468	81
77	0.05344	0.05598	0.05936	0.06340	0.06744	0.06976	82
78	0.05737	0.06018	0.06367	0.06803	0.07236	0.07547	83
79	0.06210	0.06513	0.06865	0.07316	0.07776	0.08193	84
80	0.06763	0.07087	0.07439	0.07889	0.08368	0.08925	85
81	0.07388	0.07739	0.08093	0.08532	0.09018	0.09756	86
82	0.08069	0.08456	0.08827	0.09252	0.09733	0.10699	87
83	0.08786	0.09226	0.09635	0.10054	0.10521	0.11765	88
84	0.09517	0.10032	0.10510	0.10944	0.11389	0.12968	89
85	0.10239	0.10862	0.11443	0.11924	0.12347	0.14322	90
						0.15840	91
						0.17460	92
						0.19175	93
						0.20968	94
						0.22824	95
						0.24727	96
						0.27005	97
						0.29400	98
						0.31857	99
						0.34319	100
						0.36738	101
						0.39069	102
						0.41266	103
						0.43292	104
						0.45110	105
						0.46685	106
						0.47988	107
						0.48991	108
						0.49669	109
						0.50000	110
						0.50000	111
						0.50000	112
						0.50000	113
						0.50000	114
						0.50000	115
						0.50000	116
						0.50000	117
						0.50000	118
						0.50000	119
						0.50000	120

Appendix C. 2017 Guaranteed Issue Composite Ultimate Mortality Tables

Att. Age	Unloaded, ALB		Unloaded, ANB		Loaded, ANB		Loaded, ALB	
	Male Rate	Female Rate	Male Rate	Female Rate	Male Rate	Female Rate	Male Rate	Female Rate
0	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05132	0.03594
1	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05132	0.03594
2	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05132	0.03594
3	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05132	0.03594
4	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05132	0.03594
5	0.04172	0.02922	0.04172	0.02922	0.05132	0.03594	0.05089	0.03564
6	0.04027	0.02821	0.04101	0.02872	0.05044	0.03532	0.04920	0.03445
7	0.03754	0.02630	0.03893	0.02727	0.04789	0.03354	0.04722	0.03307
8	0.03809	0.02668	0.03781	0.02649	0.04651	0.03258	0.04652	0.03259
9	0.03756	0.02632	0.03783	0.02650	0.04653	0.03259	0.04621	0.03237
10	0.03702	0.02593	0.03730	0.02613	0.04588	0.03213	0.04577	0.03206
11	0.03724	0.02608	0.03713	0.02600	0.04567	0.03199	0.04520	0.03166
12	0.03544	0.02482	0.03636	0.02546	0.04472	0.03132	0.04364	0.03056
13	0.03364	0.02356	0.03456	0.02420	0.04251	0.02977	0.04143	0.02901
14	0.03185	0.02231	0.03276	0.02294	0.04030	0.02822	0.03923	0.02747
15	0.03011	0.02109	0.03099	0.02170	0.03812	0.02670	0.03708	0.02597
16	0.02841	0.01990	0.02927	0.02050	0.03600	0.02521	0.03498	0.02449
17	0.02671	0.01871	0.02757	0.01931	0.03391	0.02375	0.03288	0.02303
18	0.02501	0.01752	0.02587	0.01812	0.03182	0.02228	0.03079	0.02156
19	0.02331	0.01632	0.02417	0.01693	0.02973	0.02082	0.02870	0.02009
20	0.02161	0.01513	0.02247	0.01573	0.02763	0.01935	0.02663	0.01865
21	0.02003	0.01403	0.02083	0.01459	0.02560	0.01793	0.02488	0.01742
22	0.01927	0.01349	0.01965	0.01377	0.02413	0.01690	0.02366	0.01657
23	0.01850	0.01296	0.01889	0.01323	0.02317	0.01623	0.02270	0.01589
24	0.01773	0.01242	0.01812	0.01269	0.02221	0.01556	0.02174	0.01522
25	0.01696	0.01188	0.01735	0.01215	0.02125	0.01488	0.02078	0.01455
26	0.01619	0.01134	0.01658	0.01161	0.02029	0.01421	0.01982	0.01388
27	0.01543	0.01080	0.01581	0.01108	0.01934	0.01354	0.01898	0.01329
28	0.01505	0.01054	0.01524	0.01067	0.01862	0.01304	0.01846	0.01293
29	0.01493	0.01045	0.01499	0.01050	0.01829	0.01281	0.01821	0.01276
30	0.01481	0.01037	0.01487	0.01041	0.01813	0.01270	0.01805	0.01264
31	0.01468	0.01029	0.01475	0.01033	0.01797	0.01259	0.01789	0.01253
32	0.01456	0.01020	0.01462	0.01024	0.01781	0.01247	0.01785	0.01250
33	0.01486	0.01041	0.01471	0.01030	0.01790	0.01254	0.01812	0.01269
34	0.01533	0.01074	0.01509	0.01057	0.01835	0.01285	0.01862	0.01304
35	0.01579	0.01106	0.01556	0.01090	0.01890	0.01324	0.01917	0.01343
36	0.01626	0.01139	0.01603	0.01123	0.01945	0.01362	0.01972	0.01382
37	0.01673	0.01172	0.01650	0.01155	0.02000	0.01401	0.02034	0.01425
38	0.01742	0.01220	0.01707	0.01196	0.02068	0.01449	0.02111	0.01478
39	0.01818	0.01273	0.01779	0.01246	0.02154	0.01509	0.02198	0.01540
40	0.01893	0.01326	0.01855	0.01299	0.02244	0.01572	0.02288	0.01603
41	0.01969	0.01379	0.01931	0.01353	0.02334	0.01635	0.02378	0.01666
42	0.02045	0.01433	0.02007	0.01406	0.02423	0.01697	0.02469	0.01730
43	0.02127	0.01490	0.02086	0.01461	0.02516	0.01763	0.02565	0.01797
44	0.02212	0.01549	0.02169	0.01519	0.02615	0.01832	0.02664	0.01866
45	0.02297	0.01609	0.02254	0.01579	0.02715	0.01901	0.02764	0.01936
46	0.02381	0.01668	0.02339	0.01638	0.02814	0.01971	0.02863	0.02006
47	0.02466	0.01727	0.02423	0.01697	0.02914	0.02041	0.02978	0.02059
48	0.02604	0.01731	0.02534	0.01729	0.03044	0.02077	0.03129	0.02074
49	0.02757	0.01719	0.02680	0.01725	0.03216	0.02070	0.03306	0.02062
50	0.02911	0.01706	0.02833	0.01712	0.03398	0.02053	0.03487	0.02045
51	0.03065	0.01693	0.02987	0.01700	0.03579	0.02036	0.03667	0.02028
52	0.03218	0.01680	0.03140	0.01687	0.03759	0.02020	0.03829	0.02025
53	0.03307	0.01716	0.03262	0.01698	0.03901	0.02031	0.03945	0.02056
54	0.03371	0.01769	0.03338	0.01742	0.03990	0.02082	0.04026	0.02113
55	0.03436	0.01822	0.03403	0.01795	0.04064	0.02144	0.04097	0.02166
56	0.03492	0.01847	0.03464	0.01834	0.04132	0.02189	0.04164	0.02206
57	0.03552	0.01883	0.03521	0.01865	0.04198	0.02223	0.04237	0.02244
58	0.03634	0.01923	0.03592	0.01903	0.04279	0.02266	0.04324	0.02294
59	0.03716	0.01979	0.03674	0.01951	0.04372	0.02321	0.04421	0.02356
60	0.03809	0.02044	0.03762	0.02011	0.04473	0.02391	0.04528	0.02431

Appendix C. 2017 Guaranteed Issue Composite Ultimate Mortality Tables

Att. Age	Unloaded, ALB		Unloaded, ANB		Loaded, ANB		Loaded, ALB	
	Male Rate	Female Rate	Male Rate	Female Rate	Male Rate	Female Rate	Male Rate	Female Rate
61	0.03914	0.02119	0.03860	0.02081	0.04586	0.02472	0.04649	0.02518
62	0.04032	0.02203	0.03972	0.02161	0.04714	0.02564	0.04783	0.02615
63	0.04160	0.02295	0.04095	0.02248	0.04856	0.02667	0.04930	0.02721
64	0.04296	0.02394	0.04227	0.02344	0.05008	0.02777	0.05087	0.02836
65	0.04440	0.02502	0.04366	0.02447	0.05169	0.02897	0.05251	0.02961
66	0.04589	0.02618	0.04513	0.02559	0.05338	0.03027	0.05423	0.03096
67	0.04744	0.02743	0.04665	0.02680	0.05513	0.03167	0.05602	0.03241
68	0.04910	0.02879	0.04825	0.02810	0.05697	0.03318	0.05794	0.03399
69	0.05092	0.03027	0.04999	0.02952	0.05897	0.03483	0.06005	0.03571
70	0.05295	0.03190	0.05191	0.03107	0.06119	0.03663	0.06240	0.03760
71	0.05527	0.03370	0.05408	0.03279	0.06369	0.03861	0.06508	0.03968
72	0.05794	0.03568	0.05657	0.03467	0.06656	0.04080	0.06815	0.04198
73	0.06099	0.03787	0.05942	0.03676	0.06986	0.04321	0.07167	0.04451
74	0.06446	0.04028	0.06267	0.03905	0.07362	0.04587	0.07566	0.04730
75	0.06835	0.04292	0.06634	0.04157	0.07786	0.04879	0.08012	0.05035
76	0.07262	0.04580	0.07041	0.04433	0.08256	0.05198	0.08502	0.05367
77	0.07726	0.04893	0.07485	0.04733	0.08770	0.05545	0.09034	0.05728
78	0.08224	0.05233	0.07965	0.05059	0.09323	0.05922	0.09605	0.06120
79	0.08754	0.05605	0.08478	0.05414	0.09915	0.06332	0.10213	0.06549
80	0.09318	0.06014	0.09023	0.05804	0.10543	0.06782	0.10858	0.07021
81	0.09916	0.06468	0.09602	0.06234	0.11211	0.07278	0.11544	0.07544
82	0.10553	0.06976	0.10218	0.06714	0.11919	0.07831	0.12272	0.08128
83	0.11235	0.07547	0.10875	0.07251	0.12674	0.08451	0.13052	0.08784
84	0.11970	0.08193	0.11581	0.07857	0.13484	0.09149	0.13891	0.09525
85	0.12771	0.08925	0.12345	0.08543	0.14362	0.09939	0.14804	0.10363
86	0.13650	0.09756	0.13181	0.09321	0.15320	0.10834	0.15805	0.11313
87	0.14626	0.10699	0.14102	0.10203	0.16377	0.11849	0.16912	0.12387
88	0.15714	0.11765	0.15127	0.11202	0.17552	0.12998	0.18145	0.13600
89	0.16935	0.12968	0.16272	0.12329	0.18864	0.14293	0.19524	0.14965
90	0.18308	0.14322	0.17558	0.13598	0.20337	0.15750	0.21021	0.16497
91	0.19641	0.15840	0.18907	0.15022	0.21880	0.17384	0.22552	0.18192
92	0.21006	0.17460	0.20249	0.16580	0.23412	0.19170	0.24088	0.20017
93	0.22390	0.19175	0.21617	0.18235	0.24971	0.21065	0.25644	0.21943
94	0.23779	0.20968	0.22997	0.19976	0.26542	0.23056	0.27206	0.23955
95	0.25162	0.22824	0.24377	0.21788	0.28110	0.25124	0.28758	0.26034
96	0.26524	0.24727	0.25745	0.23653	0.29660	0.27251	0.30390	0.28235
97	0.28363	0.27005	0.27303	0.25705	0.31427	0.29589	0.32301	0.30676
98	0.30354	0.29400	0.29194	0.28015	0.33574	0.32219	0.34489	0.33322
99	0.32449	0.31857	0.31214	0.30417	0.35865	0.34949	0.36796	0.36040
100	0.34598	0.34319	0.33315	0.32854	0.38246	0.37717	0.39085	0.38688
101	0.36757	0.36738	0.35452	0.35278	0.40444	0.40246	0.41250	0.41153
102	0.38881	0.39069	0.37580	0.37641	0.42602	0.42672	0.43357	0.43501
103	0.40927	0.41266	0.39657	0.39901	0.44673	0.44947	0.45363	0.45686
104	0.42856	0.43292	0.41643	0.42016	0.46611	0.47029	0.47226	0.47669
105	0.44630	0.45110	0.43501	0.43950	0.48378	0.48878	0.48909	0.49413
106	0.46213	0.46685	0.45194	0.45668	0.49937	0.50461	0.50376	0.50887
107	0.47572	0.47988	0.46689	0.47138	0.51253	0.51747	0.51846	0.52060
108	0.48675	0.48991	0.47952	0.48331	0.53061	0.52710	0.53981	0.53589
109	0.49493	0.49669	0.48953	0.49220	0.55939	0.55448	0.56867	0.56389
110	0.50000	0.50000	0.49663	0.49780	0.58972	0.58502	0.59903	0.59447
111	0.50000	0.50000	0.50000	0.50000	0.62170	0.61724	0.63096	0.62665
112	0.50000	0.50000	0.50000	0.50000	0.65542	0.65123	0.66453	0.66051
113	0.50000	0.50000	0.50000	0.50000	0.69096	0.68710	0.69981	0.69612
114	0.50000	0.50000	0.50000	0.50000	0.72843	0.72494	0.73687	0.73355
115	0.50000	0.50000	0.50000	0.50000	0.76794	0.76487	0.77578	0.77289
116	0.50000	0.50000	0.50000	0.50000	0.80958	0.80699	0.81660	0.81418
117	0.50000	0.50000	0.50000	0.50000	0.85348	0.85143	0.85940	0.85750
118	0.50000	0.50000	0.50000	0.50000	0.89977	0.89833	0.90421	0.90290
119	0.50000	0.50000	0.50000	0.50000	0.94856	0.94780	0.95108	0.95039
120	0.50000	0.50000	0.50000	0.50000	1.00000	1.00000	1.00000	1.00000

Appendix D. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ALB

Male %:	100%	80%	60%	50%	40%	20%	0%
Female %:	0%	20%	40%	50%	60%	80%	100%
Att. Age	Rate	Rate	Rate	Rate	Rate	Rate	Rate
0	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
1	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
2	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
3	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
4	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
5	0.05089	0.04784	0.04479	0.04326	0.04174	0.03869	0.03564
6	0.04920	0.04625	0.04330	0.04182	0.04035	0.03740	0.03445
7	0.04722	0.04439	0.04156	0.04014	0.03873	0.03590	0.03307
8	0.04652	0.04373	0.04095	0.03955	0.03816	0.03537	0.03259
9	0.04621	0.04344	0.04067	0.03929	0.03791	0.03514	0.03237
10	0.04577	0.04303	0.04029	0.03892	0.03755	0.03480	0.03206
11	0.04520	0.04249	0.03978	0.03843	0.03708	0.03437	0.03166
12	0.04364	0.04102	0.03840	0.03710	0.03579	0.03317	0.03056
13	0.04143	0.03894	0.03646	0.03522	0.03397	0.03149	0.02901
14	0.03923	0.03688	0.03453	0.03335	0.03217	0.02982	0.02747
15	0.03708	0.03486	0.03264	0.03152	0.03041	0.02819	0.02597
16	0.03498	0.03288	0.03078	0.02973	0.02869	0.02659	0.02449
17	0.03288	0.03091	0.02894	0.02795	0.02697	0.02500	0.02303
18	0.03079	0.02894	0.02710	0.02617	0.02525	0.02341	0.02156
19	0.02870	0.02697	0.02525	0.02439	0.02353	0.02181	0.02009
20	0.02663	0.02503	0.02344	0.02264	0.02184	0.02024	0.01865
21	0.02488	0.02338	0.02189	0.02115	0.02040	0.01891	0.01742
22	0.02366	0.02224	0.02082	0.02011	0.01940	0.01799	0.01657
23	0.02270	0.02134	0.01998	0.01930	0.01862	0.01726	0.01589
24	0.02174	0.02043	0.01913	0.01848	0.01783	0.01653	0.01522
25	0.02078	0.01953	0.01829	0.01766	0.01704	0.01580	0.01455
26	0.01982	0.01863	0.01744	0.01685	0.01626	0.01507	0.01388
27	0.01898	0.01784	0.01671	0.01614	0.01557	0.01443	0.01329
28	0.01846	0.01735	0.01625	0.01569	0.01514	0.01403	0.01293
29	0.01821	0.01712	0.01603	0.01549	0.01494	0.01385	0.01276
30	0.01805	0.01697	0.01589	0.01535	0.01481	0.01373	0.01264
31	0.01789	0.01682	0.01575	0.01521	0.01467	0.01360	0.01253
32	0.01785	0.01678	0.01571	0.01518	0.01464	0.01357	0.01250
33	0.01812	0.01703	0.01595	0.01541	0.01486	0.01378	0.01269
34	0.01862	0.01750	0.01639	0.01583	0.01527	0.01416	0.01304
35	0.01917	0.01802	0.01687	0.01630	0.01573	0.01458	0.01343
36	0.01972	0.01854	0.01736	0.01677	0.01618	0.01500	0.01382
37	0.02034	0.01912	0.01790	0.01729	0.01668	0.01547	0.01425
38	0.02111	0.01984	0.01858	0.01795	0.01731	0.01605	0.01478
39	0.02198	0.02067	0.01935	0.01869	0.01803	0.01672	0.01540
40	0.02288	0.02151	0.02014	0.01946	0.01877	0.01740	0.01603
41	0.02378	0.02236	0.02093	0.02022	0.01951	0.01808	0.01666
42	0.02469	0.02321	0.02174	0.02100	0.02026	0.01878	0.01730
43	0.02565	0.02411	0.02258	0.02181	0.02104	0.01950	0.01797
44	0.02664	0.02504	0.02345	0.02265	0.02185	0.02026	0.01866
45	0.02764	0.02598	0.02433	0.02350	0.02267	0.02102	0.01936
46	0.02863	0.02692	0.02520	0.02434	0.02349	0.02177	0.02006
47	0.02978	0.02794	0.02610	0.02518	0.02427	0.02243	0.02059
48	0.03129	0.02918	0.02707	0.02601	0.02496	0.02285	0.02074
49	0.03306	0.03057	0.02808	0.02684	0.02559	0.02311	0.02062
50	0.03487	0.03198	0.02910	0.02766	0.02622	0.02333	0.02045
51	0.03667	0.03340	0.03012	0.02848	0.02684	0.02356	0.02028
52	0.03829	0.03468	0.03108	0.02927	0.02747	0.02386	0.02025
53	0.03945	0.03567	0.03189	0.03001	0.02812	0.02434	0.02056
54	0.04026	0.03643	0.03261	0.03069	0.02878	0.02495	0.02113
55	0.04097	0.03711	0.03325	0.03132	0.02938	0.02552	0.02166
56	0.04164	0.03773	0.03381	0.03185	0.02989	0.02597	0.02206
57	0.04237	0.03839	0.03440	0.03241	0.03042	0.02643	0.02244
58	0.04324	0.03918	0.03512	0.03309	0.03106	0.02700	0.02294
59	0.04421	0.04008	0.03595	0.03389	0.03182	0.02769	0.02356
60	0.04528	0.04109	0.03689	0.03480	0.03270	0.02851	0.02431

Appendix D. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ALB

Male %:	100%	80%	60%	50%	40%	20%	0%
Female %:	0%	20%	40%	50%	60%	80%	100%
Att. Age	Rate	Rate	Rate	Rate	Rate	Rate	Rate
61	0.04649	0.04223	0.03796	0.03583	0.03370	0.02944	0.02518
62	0.04783	0.04350	0.03916	0.03699	0.03482	0.03049	0.02615
63	0.04930	0.04488	0.04047	0.03826	0.03605	0.03163	0.02721
64	0.05087	0.04637	0.04187	0.03962	0.03737	0.03287	0.02836
65	0.05251	0.04793	0.04335	0.04106	0.03877	0.03419	0.02961
66	0.05423	0.04958	0.04492	0.04259	0.04027	0.03561	0.03096
67	0.05602	0.05130	0.04658	0.04422	0.04186	0.03714	0.03241
68	0.05794	0.05315	0.04836	0.04597	0.04357	0.03878	0.03399
69	0.06005	0.05518	0.05031	0.04788	0.04544	0.04058	0.03571
70	0.06240	0.05744	0.05248	0.05000	0.04752	0.04256	0.03760
71	0.06508	0.06000	0.05492	0.05238	0.04984	0.04476	0.03968
72	0.06815	0.06292	0.05768	0.05507	0.05245	0.04722	0.04198
73	0.07167	0.06624	0.06081	0.05809	0.05538	0.04994	0.04451
74	0.07566	0.06998	0.06431	0.06148	0.05864	0.05297	0.04730
75	0.08012	0.07416	0.06821	0.06523	0.06225	0.05630	0.05035
76	0.08502	0.07875	0.07248	0.06934	0.06621	0.05994	0.05367
77	0.09034	0.08373	0.07711	0.07381	0.07050	0.06389	0.05728
78	0.09605	0.08908	0.08211	0.07863	0.07514	0.06817	0.06120
79	0.10213	0.09480	0.08747	0.08381	0.08015	0.07282	0.06549
80	0.10858	0.10091	0.09323	0.08940	0.08556	0.07789	0.07021
81	0.11544	0.10744	0.09944	0.09544	0.09144	0.08344	0.07544
82	0.12272	0.11444	0.10615	0.10200	0.09786	0.08957	0.08128
83	0.13052	0.12198	0.11345	0.10918	0.10491	0.09638	0.08784
84	0.13891	0.13018	0.12145	0.11708	0.11272	0.10398	0.09525
85	0.14804	0.13916	0.13028	0.12584	0.12140	0.11251	0.10363
86	0.15805	0.14907	0.14008	0.13559	0.13110	0.12211	0.11313
87	0.16912	0.16007	0.15102	0.14650	0.14197	0.13292	0.12387
88	0.18145	0.17236	0.16327	0.15873	0.15418	0.14509	0.13600
89	0.19524	0.18612	0.17700	0.17244	0.16789	0.15877	0.14965
90	0.21021	0.20116	0.19211	0.18759	0.18307	0.17402	0.16497
91	0.22552	0.21680	0.20808	0.20372	0.19936	0.19064	0.18192
92	0.24088	0.23274	0.22460	0.22053	0.21646	0.20831	0.20017
93	0.25644	0.24904	0.24164	0.23794	0.23424	0.22683	0.21943
94	0.27206	0.26556	0.25906	0.25580	0.25255	0.24605	0.23955
95	0.28758	0.28214	0.27669	0.27396	0.27124	0.26579	0.26034
96	0.30390	0.29959	0.29528	0.29313	0.29097	0.28666	0.28235
97	0.32301	0.31976	0.31651	0.31488	0.31326	0.31001	0.30676
98	0.34489	0.34255	0.34022	0.33905	0.33789	0.33555	0.33322
99	0.36796	0.36644	0.36493	0.36418	0.36342	0.36191	0.36040
100	0.39085	0.39006	0.38926	0.38886	0.38847	0.38767	0.38688
101	0.41250	0.41230	0.41211	0.41201	0.41192	0.41173	0.41153
102	0.43357	0.43386	0.43415	0.43429	0.43443	0.43472	0.43501
103	0.45363	0.45428	0.45492	0.45525	0.45557	0.45622	0.45686
104	0.47226	0.47315	0.47403	0.47448	0.47492	0.47580	0.47669
105	0.48909	0.49010	0.49111	0.49161	0.49212	0.49312	0.49413
106	0.50376	0.50478	0.50580	0.50632	0.50683	0.50785	0.50887
107	0.51846	0.51889	0.51932	0.51953	0.51975	0.52017	0.52060
108	0.53391	0.53393	0.53382	0.53378	0.53374	0.53367	0.53358
109	0.54867	0.54871	0.54866	0.54862	0.54858	0.54851	0.54843
110	0.56303	0.56307	0.56302	0.56298	0.56294	0.56287	0.56279
111	0.57699	0.57703	0.57698	0.57694	0.57690	0.57683	0.57675
112	0.59055	0.59059	0.59054	0.59050	0.59046	0.59039	0.59031
113	0.60371	0.60375	0.60370	0.60366	0.60362	0.60355	0.60347
114	0.61647	0.61651	0.61646	0.61642	0.61638	0.61631	0.61623
115	0.62883	0.62887	0.62882	0.62878	0.62874	0.62867	0.62859
116	0.64079	0.64083	0.64078	0.64074	0.64070	0.64063	0.64055
117	0.65235	0.65239	0.65234	0.65230	0.65226	0.65219	0.65211
118	0.66351	0.66355	0.66350	0.66346	0.66342	0.66335	0.66327
119	0.67427	0.67431	0.67426	0.67422	0.67418	0.67411	0.67403
120	0.68463	0.68467	0.68462	0.68458	0.68454	0.68447	0.68439

Appendix E. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ANB

Male %:	100%	80%	60%	50%	40%	20%	0%
Female %:	0%	20%	40%	50%	60%	80%	100%
Att. Age	Rate	Rate	Rate	Rate	Rate	Rate	Rate
0	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
1	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
2	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
3	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
4	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
5	0.05132	0.04824	0.04516	0.04363	0.04209	0.03901	0.03594
6	0.05044	0.04742	0.04439	0.04288	0.04137	0.03835	0.03532
7	0.04789	0.04502	0.04215	0.04071	0.03928	0.03641	0.03354
8	0.04651	0.04372	0.04094	0.03954	0.03815	0.03536	0.03258
9	0.04653	0.04375	0.04096	0.03956	0.03817	0.03538	0.03259
10	0.04588	0.04313	0.04038	0.03901	0.03763	0.03488	0.03213
11	0.04567	0.04293	0.04019	0.03883	0.03746	0.03472	0.03199
12	0.04472	0.04204	0.03936	0.03802	0.03668	0.03400	0.03132
13	0.04251	0.03996	0.03741	0.03614	0.03486	0.03232	0.02977
14	0.04030	0.03788	0.03547	0.03426	0.03305	0.03064	0.02822
15	0.03812	0.03584	0.03355	0.03241	0.03127	0.02898	0.02670
16	0.03600	0.03385	0.03169	0.03061	0.02953	0.02737	0.02521
17	0.03391	0.03188	0.02985	0.02883	0.02781	0.02578	0.02375
18	0.03182	0.02991	0.02800	0.02705	0.02610	0.02419	0.02228
19	0.02973	0.02794	0.02616	0.02527	0.02438	0.02260	0.02082
20	0.02763	0.02598	0.02432	0.02349	0.02266	0.02101	0.01935
21	0.02560	0.02406	0.02253	0.02176	0.02100	0.01946	0.01793
22	0.02413	0.02269	0.02124	0.02052	0.01980	0.01835	0.01690
23	0.02317	0.02178	0.02039	0.01970	0.01901	0.01762	0.01623
24	0.02221	0.02088	0.01955	0.01888	0.01822	0.01689	0.01556
25	0.02125	0.01998	0.01870	0.01807	0.01743	0.01616	0.01488
26	0.02029	0.01908	0.01786	0.01725	0.01665	0.01543	0.01421
27	0.01934	0.01818	0.01702	0.01644	0.01586	0.01470	0.01354
28	0.01862	0.01750	0.01639	0.01583	0.01527	0.01416	0.01304
29	0.01829	0.01720	0.01610	0.01555	0.01501	0.01391	0.01281
30	0.01813	0.01705	0.01596	0.01542	0.01487	0.01379	0.01270
31	0.01797	0.01689	0.01582	0.01528	0.01474	0.01366	0.01259
32	0.01781	0.01674	0.01567	0.01514	0.01461	0.01354	0.01247
33	0.01790	0.01683	0.01575	0.01522	0.01468	0.01361	0.01254
34	0.01835	0.01725	0.01615	0.01560	0.01505	0.01395	0.01285
35	0.01890	0.01777	0.01663	0.01607	0.01550	0.01437	0.01324
36	0.01945	0.01829	0.01712	0.01654	0.01595	0.01479	0.01362
37	0.02000	0.01880	0.01761	0.01701	0.01641	0.01521	0.01401
38	0.02068	0.01944	0.01820	0.01758	0.01697	0.01573	0.01449
39	0.02154	0.02025	0.01896	0.01831	0.01767	0.01638	0.01509
40	0.02244	0.02109	0.01975	0.01908	0.01841	0.01706	0.01572
41	0.02334	0.02194	0.02054	0.01984	0.01914	0.01774	0.01635
42	0.02423	0.02278	0.02133	0.02060	0.01988	0.01843	0.01697
43	0.02516	0.02366	0.02215	0.02140	0.02064	0.01913	0.01763
44	0.02615	0.02458	0.02302	0.02223	0.02145	0.01988	0.01832
45	0.02715	0.02552	0.02389	0.02308	0.02227	0.02064	0.01901
46	0.02814	0.02646	0.02477	0.02393	0.02308	0.02140	0.01971
47	0.02914	0.02739	0.02565	0.02477	0.02390	0.02215	0.02041
48	0.03044	0.02851	0.02658	0.02561	0.02464	0.02271	0.02077
49	0.03216	0.02987	0.02758	0.02643	0.02529	0.02300	0.02070
50	0.03398	0.03129	0.02860	0.02726	0.02591	0.02322	0.02053
51	0.03579	0.03270	0.02962	0.02808	0.02653	0.02345	0.02036
52	0.03759	0.03411	0.03063	0.02889	0.02715	0.02367	0.02020
53	0.03901	0.03527	0.03153	0.02966	0.02779	0.02405	0.02031
54	0.03990	0.03608	0.03227	0.03036	0.02845	0.02464	0.02082
55	0.04064	0.03680	0.03296	0.03104	0.02912	0.02528	0.02144
56	0.04132	0.03744	0.03355	0.03160	0.02966	0.02577	0.02189
57	0.04198	0.03803	0.03408	0.03210	0.03013	0.02618	0.02223
58	0.04279	0.03876	0.03474	0.03272	0.03071	0.02669	0.02266
59	0.04372	0.03962	0.03552	0.03347	0.03142	0.02732	0.02321
60	0.04473	0.04056	0.03640	0.03432	0.03224	0.02808	0.02391

Appendix E. 2017 Loaded Guaranteed Issue Composite, Ultimate, Gender Blended Mortality Tables, ANB

Male %:	100%	80%	60%	50%	40%	20%	0%
Female %:	0%	20%	40%	50%	60%	80%	100%
Att. Age	Rate	Rate	Rate	Rate	Rate	Rate	Rate
61	0.04586	0.04163	0.03741	0.03529	0.03318	0.02895	0.02472
62	0.04714	0.04284	0.03854	0.03639	0.03424	0.02994	0.02564
63	0.04856	0.04418	0.03980	0.03761	0.03542	0.03104	0.02667
64	0.05008	0.04562	0.04116	0.03893	0.03670	0.03223	0.02777
65	0.05169	0.04715	0.04261	0.04033	0.03806	0.03352	0.02897
66	0.05338	0.04876	0.04414	0.04183	0.03952	0.03489	0.03027
67	0.05513	0.05044	0.04574	0.04340	0.04105	0.03636	0.03167
68	0.05697	0.05221	0.04746	0.04508	0.04270	0.03794	0.03318
69	0.05897	0.05414	0.04931	0.04690	0.04449	0.03966	0.03483
70	0.06119	0.05628	0.05136	0.04891	0.04645	0.04154	0.03663
71	0.06369	0.05867	0.05366	0.05115	0.04864	0.04363	0.03861
72	0.06656	0.06141	0.05626	0.05368	0.05110	0.04595	0.04080
73	0.06986	0.06453	0.05920	0.05654	0.05387	0.04854	0.04321
74	0.07362	0.06807	0.06252	0.05974	0.05697	0.05142	0.04587
75	0.07786	0.07205	0.06623	0.06332	0.06042	0.05460	0.04879
76	0.08256	0.07645	0.07033	0.06727	0.06421	0.05810	0.05198
77	0.08770	0.08125	0.07480	0.07157	0.06835	0.06190	0.05545
78	0.09323	0.08643	0.07963	0.07622	0.07282	0.06602	0.05922
79	0.09915	0.09198	0.08482	0.08123	0.07765	0.07048	0.06332
80	0.10543	0.09791	0.09039	0.08662	0.08286	0.07534	0.06782
81	0.11211	0.10424	0.09638	0.09244	0.08851	0.08065	0.07278
82	0.11919	0.11101	0.10284	0.09875	0.09466	0.08649	0.07831
83	0.12674	0.11829	0.10985	0.10562	0.10140	0.09295	0.08451
84	0.13484	0.12617	0.11750	0.11317	0.10883	0.10016	0.09149
85	0.14362	0.13477	0.12593	0.12151	0.11708	0.10824	0.09939
86	0.15320	0.14423	0.13526	0.13077	0.12629	0.11732	0.10834
87	0.16377	0.15472	0.14566	0.14113	0.13661	0.12755	0.11849
88	0.17552	0.16641	0.15730	0.15275	0.14819	0.13908	0.12998
89	0.18864	0.17950	0.17036	0.16578	0.16121	0.15207	0.14293
90	0.20337	0.19419	0.18502	0.18043	0.17585	0.16667	0.15750
91	0.21880	0.20981	0.20082	0.19632	0.19183	0.18284	0.17384
92	0.23412	0.22564	0.21715	0.21291	0.20867	0.20019	0.19170
93	0.24971	0.24190	0.23409	0.23018	0.22627	0.21846	0.21065
94	0.26542	0.25845	0.25147	0.24799	0.24450	0.23753	0.23056
95	0.28110	0.27513	0.26915	0.26617	0.26318	0.25721	0.25124
96	0.29660	0.29179	0.28697	0.28456	0.28215	0.27733	0.27251
97	0.31427	0.31060	0.30692	0.30508	0.30324	0.29956	0.29589
98	0.33574	0.33303	0.33032	0.32897	0.32761	0.32490	0.32219
99	0.35865	0.35682	0.35499	0.35407	0.35316	0.35133	0.34949
100	0.38246	0.38140	0.38034	0.37981	0.37929	0.37823	0.37717
101	0.40444	0.40404	0.40365	0.40345	0.40325	0.40286	0.40246
102	0.42602	0.42616	0.42630	0.42637	0.42644	0.42658	0.42672
103	0.44673	0.44728	0.44783	0.44810	0.44837	0.44892	0.44947
104	0.46611	0.46695	0.46778	0.46820	0.46862	0.46945	0.47029
105	0.48378	0.48478	0.48578	0.48628	0.48678	0.48778	0.48878
106	0.49937	0.50042	0.50147	0.50199	0.50251	0.50356	0.50461
107	0.51253	0.51352	0.51451	0.51500	0.51550	0.51648	0.51747
108	0.53061	0.52991	0.52921	0.52885	0.52850	0.52780	0.52710
109	0.55939	0.55841	0.55743	0.55694	0.55644	0.55546	0.55448
110	0.58972	0.58878	0.58784	0.58737	0.58690	0.58596	0.58502
111	0.62170	0.62081	0.61992	0.61947	0.61902	0.61813	0.61724
112	0.65542	0.65458	0.65374	0.65333	0.65291	0.65207	0.65123
113	0.69096	0.69019	0.68942	0.68903	0.68864	0.68787	0.68710
114	0.72843	0.72773	0.72703	0.72669	0.72634	0.72564	0.72494
115	0.76794	0.76733	0.76671	0.76641	0.76610	0.76548	0.76487
116	0.80958	0.80906	0.80854	0.80829	0.80803	0.80751	0.80699
117	0.85348	0.85307	0.85266	0.85246	0.85225	0.85184	0.85143
118	0.89977	0.89948	0.89919	0.89905	0.89891	0.89862	0.89833
119	0.94856	0.94841	0.94826	0.94818	0.94810	0.94795	0.94780
120	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000