The State of Israel
Ministry of Finances – Capital Markets, Insurance & Savings Division

February 20th, 2007

Insurance circular 2007-1-3
Classification: stability

Calculation of reserves for annuity payment in life assurance policies

In my capacity pursuant to articles 2(b) and 42 to the Supervision of Financial Services (Insurance) Law, 1981, I hereby instruct the following:

1. General

Due to the pace of improvement in life expectancy, there is need to follow up on the adequacy of reserves in respect of life assurance policies that allow receiving annuities (hereinafter: "**reserves for annuity payment**") and enhance them properly.

2. Attribution to insurance policies groups

It is important that any enhancement for reserves for annuity payment required as per this circular be attributed to the proper insurance policies groups. Starting from 1999, following the implementation of the DAC method in which each insurer is required to choose the most appropriate attribution method for itself, each enhancement for reserves for annuity payment should be attributed to insurance policies groups according to the same method by which the DAC was attributed to the policies. Regarding policies issued before January 1st, 1999, each enhancement for reserves for annuity payment should be attributed as per funds (from Fund A to Fund J, as the case may be).

3. The method for enhancing reserves for annuity payment

a. **Immediate enhancement - policies regarding which the annuity is being paid, insureds have reached the expected age of retirement or the policies group may not be profitable**

The insurer will enhance the reserves for annuity payment immediately, for each life assurance policy of the "annuity" type that meets one or more of the following criterions:

1) The annuity is paid to the insured or his beneficiaries;
2) Insured has reached the expected age of retirement set by the insurer;
3) The policy belongs to a particular insurance policies group, as stated in Clause 2 above, and the insurer's appointed actuary is of the opinion that the group may not be profitable as per conservative assumptions. I.e., the above mentioned policies group, along with the insurer's investments held against reserves in its respect, may not create sufficient future revenues for covering all the claims' and expenses' payments that will be discovered in the future regarding the above-mentioned policies group and investments, including the enhancement for the reserves for annuity payment for that policies group.

b. **Enhancement during the policy's life - other policies-**

1) Insurers may enhance the reserves for annuity payment during the policy's life for each life assurance policy of the annuity type that does not meet any of the criteria set forth in Clause 3.a

above, but that belongs to the insurance policies group as per Clause 2 above - when, as per the opinion of the insurer's appointed actuary, the group may be profitable as per conservative assumptions.

2) The above mentioned assumptions will be supported by sensitivity tests and/or other statistical analyses.

3) A detailed description of the calculation method, assumptions, sensitivity tests and/or other statistical analyses, as well as the results of these tests and analyses, upon which the evaluation of the appointed actuary mentioned in Clause 1) above relies, will be submitted in writing to the Commissioner of Insurance (hereinafter: "**The Commissioner**") by the end of March every year, regarding the insurer's FS for the previous year. Also, this information will be attached to the annual actuarial report on life assurance, that is submitted to the Commissioner.

4) The insurer will choose one of the following methods:

   a. **Enhancement along the policy's life until the expected age of retirement as per a geometric formula**

   The insurer may accrue the enhancement of reserves for annuity payment as per the following formula, according to which the required addition for enhancing the reserves for annuity payment (in percentage), as of the date of the calculation, will be equal to:

$$ {}_{ERA-x}P_x * \left(\frac{(1+T)}{(1+K)^{ERA-X}} - 1\right) $$

   For this matter:
   ERA - the expected age of retirement set forth by the insurer.

   T - the required addition for enhancing the reserves for annuity payment (in percentage) as of the expected age of retirement, in case the policy is converted to annuity as per the assumptions described hereinafter in Clauses 4 & 6 to this circular. T will be factored in only when it is positive.

   ${}_{ERA-x}P_x$ - the probability that the policy will remain in force until the expected age of retirement and will be converted to annuity as per the assumptions described hereinafter in Clauses 4 & 6 to this circular.

   x - the insured's age at the time of calculation.

   K - the rate of expected future revenues from management fees or financial spread stemming from investments held against insurance reserves due to the policy or due to premium payments for the policy, factored into the calculation of the accrual of enhancement for reserves for annuity payment due to the policies.
   The insurer will set forth *K* cautiously. Setting *K* at over 0.3% will require the Commissioner's approval. Any approval request as mentioned above shall be accompanied with an analysis based on conservative

financial assumptions, indicating that the management fees or the financial spread held against the reserve due to the policy and premium payments for the policy, may generate future revenues that exceed *K*, that are sufficient for covering all expenses that will be discovered until the expected date of retirement that are related to the above mentioned policy and investments[1]. In addition, upon giving such an approval, the reliability of the data upon which the assumptions chosen by the insurer rely as per Clause 4 hereinafter, as well as the level of conservatism embedded in these assumptions, should be examined.

If *K* changes, the insurer shall disclose the reason and the impact of the change on the FS. The above mentioned disclosure shall be published in the first FS issued to the public, in which this change is expressed.

b. **Faster enhancement**

The insurer may choose a method that produces a faster enhancement than the above mentioned formula, going as far as immediate enhancement.

4) In selecting the enhancement method, the insurer's appointed actuary shall examine the sensitivity of the various methods, including the method defined in Clause 3.b.4)a) above, to possible future changes in the assumptions described hereinafter in Clause 4 to the Circular.

4. <u>Assumptions for setting the enhancement for reserves for annuity payment</u>

Regarding the following parameters, insurers should choose cautious and appropriate assumptions. These assumptions will be submitted in writing to the Commissioner by the by the end of March every year, regarding the insurer's FS for the previous year[2], plus explanation for the selection. For this matter, "explanations" - include partially or fully reliable statistical data if available, and detailed interpretation expressing professional discretion:

a. Mortality;
b. Interest rates for capitalizing the reserves for annuity payment starting from the beginning of annuity payment;
c. Expected retirement age of insureds;
d. Adjusted life expectancy among the insureds characterized as follows:
    1) Annuities are paid to insureds[3];
    2) Insureds reached the expected age of retirement[4];
    3) Individual policies that are not insurance funds;
    4) Money deposited before 2000 to managers' insurance policies;
    5) Money deposited before 2000 to self-employeds policies produced until the effective date as per the Regulation 38 (d) to

[1] Inter alia, for the sake of the above mentioned analysis, any forecast of future yields on investments that are not designated bonds shall rely on risk-free investment gains in Israel.

[2] When submitting to the Commissioner, changes in the assumptions compared with the previous year should be stated.

[3] As long as annuities being paid, and those that are expected to start being paid in the upcoming years, originate from monies prior to 2000. Regarding monies deposited before 2000, the insureds do not have to receive the monies deposited in the annuity policies via an annuity; i.e., a payment via another manner is not considered as unlawful and is not taxed at at least 35%.

[4] Idem.

the Income Tax Regulations (Rules for approving and managing provident funds) - 1964 (hereinafter: "**the effective date**");

e. Rate of policy surrender until the age of retirement (hereinafter: "**surrender rates**") that will be set as per the following rules:
   1) The surrender rate assumption shall not exceed 60% of surrender rates that are expected to occur in the future among annuity-type life assurance policies;
   2) The above mentioned expected surrender rates will be based on an updated and multi-year study of policy surrender rates and the professional discretion of the appointed actuary[5];

f. The probability for selecting an annuity upon the age of retirement, for:
   1) Individual policies that are not insurance funds;
   2) Money deposited before 2000 for pension benefits in managers' policies;
   3) Money deposited before 2000 for self-employeds policies that were produced until the effective date;

g. The probability for selecting an annuity upon the age of retirement, from monies not transferred to "the lump-sum Appendix", regarding:
   1) Money deposited after 1999 for pension benefits in managers' insurance policies;
   2) Money deposited after 1999 for self-employeds policies that were produced until the effective date;

h. The probability for selecting an annuity upon the age of retirement for self-employeds policies that were produced until the effective date;

i. The probability for selecting an annuity upon the age of retirement for severance pay deposited before 2000;

j. The probability for receiving an annuity in each of the various possibilities as per the terms of the policy, for example: 10 guaranteed years and until the end of the insured's life, etc;

k. Insurer's expenses in respect of annuity payment;

5. <u>Addition to reserve for enhancing the required amount to the surrender value in managers' insurance policy</u>

Pursuant to the Commissioner Circular 10/98 dated October 15th, 1998, it was stated that should the mathematical reserve less DAC for tax purposes be less than the surrender value in managers' insurance policies, there is need to create an addition to the reserve in order to complete the required amount of the surrender value as per the rates set forth in the Circular. The additional reserve required as a result of insurers' undertaking to pay annuity shall not be offset by the addition to reserve for completing the required amount of the surrender value in a managers' insurance policy. I.e., there is need to create an addition to reserve as a result of insurers' undertaking to pay annuity in addition to the additional reserve for completing the required amount of the surrender value in the managers' insurance policy.

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[5] This research:

1) Will be based on "amounts"; i.e., in calculating surrender values, there will be a greater weight to policies in which the amount of savings to annuities is higher;
2) Will differentiate between surrender values that occur in years adjacent to the date of insurance policy issuance ("select period") and the surrender rates occurring in later years ("ultimate" rates);
3) Will differentiate, as much as possible, between surrender rates related to policies and deposits to policies to policies that are tax exempt on the surrender amount, and surrender rates related to policies and deposits to policies to policies that are not tax exempt on the surrender amount.
4) Will differentiate, as much as possible, between types of policies with various characteristics that may affect the expected surrender rates (for example, Adif type policies vs. Endowment type policies).

6. Transition provision

a. In spite of what is stated in Clause 4 above, insurers may, for the sake of FS in respect of 2006 and the first three quarters of 2007, use the following assumptions, without submitting them in writing to the Commissioner and without adding explanations to the selection:

1) **Mortality assumptions**

The mortality assumptions are described in Appendices 1, 2 & 3 to this Circular.

2) **Interest rates for capitalizing reserves for annuity payment**

The reserves for annuity payment should be calculated separately for each fund, starting from the beginning of the annuity payment, as per interest rates for capitalization shown in the following table. The reserves for annuity payment should not be calculated as per the above rates before the beginning of the annuity payment.

Fund	Current interest rate imputed to reserve	Interest rate on Hetz bonds	Maximum rate of investment in Hetz	**Interest rate for calculation**
A	4%	6.2%	100%	**6.2%**
B	4%-5%	6.2%	86%	**5.8%**
C	4.25%	5.2%	86%	**4.9%**
D	4.25%	5.2%	86%	**4.9%**
E	4.25%	5.2%	86%	**4.9%**
F	4.25%	5.2%	86%	**4.9%**
G	3.5%	4%	86%	**3.9%**
H	3.5%	5.2%	50%	**4.3%**
I	2.5%	4%	40%	**3.54%**
J	2.5%[6]	------	------	**3.54%**[7]
(L1)[8]	4.25%	4%	86%	**3.9%**

[6] For policies issued between 1992-2003, the interest rate imputed to the reserve is 2.5%. For policies produced later on, the interest rate imputed to the reserve is set as per the interest rate upon which the annuity coefficient in the policy is based.

[7] For policies issued between 1992-2003, the interest rate for the calculation is 3.54%. For policies produced later on, the interest rate for calculation should be set taking into account the interest rate upon which the annuity coefficient in the policy is based.

[8] Fund L1 - a fund stemming from managers' "endowment" insurance policies issued to policyholders due to a real increase in their salary in 1990 and 1991.

3) **Other assumptions**

Expected age of retirement for insureds	65
Increased life expectancy among the insureds with the following characteristics - annuities paid to insureds[9] and insureds who have reached the expected age of retirement[10]; individual policies that are not insurance funds; money deposited before 2000 to managers' insurance policies; money deposited before 2000 to self-employeds policies issued until the effective date.	The reserve that will be calculated as per the assumptions mentioned in sub-clause 6 a 1) above, will be increased by 3%
Probability for selecting annuities upon the age of retirement - individual policies that are not insurance funds; money deposited before 2000 for pension benefits in managers' insurance policies; money deposited before 2000 to self-employeds policies produced until the effective date	6%[11]
Probability for selecting annuities upon the age of retirement from monies not transferred to the "lump sum Appendix"- money deposited after 1999 for pension benefits in managers' insurance policies; money deposited after 1999 to self-employeds policies produced until the effective date	100%
Probability for selecting annuities upon the age of retirement - self-employeds policies produced after the effective date	90%
Probability for selecting annuities upon the age of retirement - severance pay monies deposited before 2000	6%[12]
Probability for selecting annuities upon the age of retirement - severance pay monies deposited after 1999	35%
Policy surrender rates - money deposited after 1999 for pension benefits in managers' insurance policies; money deposited after 1999 to self-employeds policies produced until the effective date; self-employeds policies produced after the effective date; severance pay monies deposited after 1999	Up to 2.5% per year
Probability for receiving annuities in their various forms	10 guaranteed years and until the end of life: probability of 80%; 5 years guaranteed and until the end of life: probability of 20%
Insurers' expenses in respect of annuity payments	NIS 40 per month per policy, or 0.7% of annuity

[9] Provided the annuities being paid, and those expected to start being paid in the upcoming years, originate from monies before 2000. Regarding monies deposited before 2000, the insured does not have to receive the monies accrued in annuity policies via an annuity, i.e., any other way of payment does not constitute an unlawful payment and does not entail a payment of at least 35% tax.

[10] Idem.

[11] Including an assumption of an annual surrender rate of approx. 2.5%.

[12] Idem

b. The enhancement of reserve in respect of a positive difference that will be calculated as of December 31st, 2006, between the provision for reserves for annuity payment calculated as per the provisions of this circular and the provision for reserves for annuity payment calculated as per the method and the assumptions on which the insurer relied in the FS for 3Q06, may be done with a spread starting from 4Q06 and no later than 4Q09, in a unified manner.

7. Application

The Circular's provisions shall apply to any insurer dealing with annuity type life assurance.

8. Beginning

a. The provisions of the Circular are in effect as of the date of their publication.

b. In spite of Clause a above, the beginning of the demand to perform sensitivity tests and/or statistical analyses for establishing the evaluation as to the profitability of policy groups as stated in Clause 3 b.2) above, as well as for submitting information to the Commissioner as stated in Clause 3 b.3) - starts from the annual FS as of 2007.

9. Cancellation of validity

Insurance Circular 2002/5 regarding the calculation of reserves for annuity payment in life assurance policies - is void.

Yadin Antebi
Commissioner of Insurance

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Ministry of Finances – Capital Markets, Insurance & Savings Division

Appendix 1
Basic mortality tables

The basic mortality tables that should be referred to are detailed hereinafter:

1. Introduction

Tables B1, B2 and B3, except the spreads and adjustments detailed in this appendix, were built by the pension funds detailed hereinafter (hereinafter - **the six funds**) and were approved by the Capital Markets, Insurance & Savings Division of the Ministry of Finance in order to prepare the actuarial balance sheets of the following pension funds: Mivtachim Employees Social Insurance Institution (hereinafter - **Mivtachim**), Makefet Center for Pensions and Benefits, Cooperative Association Ltd. (hereinafter - **Makefet**), the Central Annuity Fund of Histadrut Employees Ltd. (hereinafter - **CAF**), Nativ - the Fund for Workers and Employees of the Histadrut Ltd. (hereinafter - **Nativ**), Insurance and Pension Fund for Agricultural Workers and Non-Professional Workers in Israel, Cooperative Association Ltd. and the Insurance and Pension Fund for Construction and Public Works Workers, Cooperative Association Ltd.[13]. The period in which the data that served for building these tables was gathered is 1999-2004.

2. Active insured in the period until the beginning of annuity payment[14]

a. **Population**
The mortality table is based on the data of active insureds in the six funds.

b. **Calculation method**
The table was calculated based on "amounts" regarding the insured salary level.[15]

c. **Spread for possible random deviations and deviations stemming from the composition of insureds' population**
The mortality rates in the table mentioned in Clause 2a. above, were adjusted downward by 4% as per Appendix B to the position paper regarding the adequacy of reserves for annuity-type life assurance policies, published by the Capital Markets Division on April 2005 (hereinafter - "**position paper**").

d. **Table B1 of adjusted mortality rates**
The adjusted mortality rates as stated in Clause 2.c above are presented in Table B1 hereinafter.

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[13] Information about building the tables is published on the website of the old pension funds in the "arrangement": www.mpv.co.il.

[14] In this appendix, "the beginning of the annuity payment" - regarding insureds for whom the annuity payment has not started yet – means the future expected date for annuity payment; and regarding insureds for whom the annuity payment has already started - the actual date for annuity payment.

[15] In the calculation of mortality rate, for each age and gender separately, there is a larger weight for insureds with higher insured wage.

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Table B1
Basic mortality rates as of December 31st, 2001
For active insureds until the beginning of annuity payment

Age	Male	Female	Age	Male	Female
18	0.000196	0.000035	42	0.000651	0.000409
19	0.000298	0.000038	43	0.000712	0.000445
20	0.000301	0.000037	44	0.000782	0.000485
21	0.000279	0.000033	45	0.000862	0.000530
22	0.000265	0.000029	46	0.000951	0.000580
23	0.000254	0.000030	47	0.001051	0.000637
24	0.000246	0.000032	48	0.001163	0.000702
25	0.000240	0.000033	49	0.001288	0.000776
26	0.000238	0.000034	50	0.001426	0.000859
27	0.000238	0.000037	51	0.001579	0.000953
28	0.000240	0.000039	52	0.001747	0.001060
29	0.000243	0.000042	53	0.001931	0.001180
30	0.000249	0.000044	54	0.002132	0.001314
31	0.000277	0.000080	55	0.002350	0.001465
32	0.000304	0.000115	56	0.002588	0.001634
33	0.000329	0.000147	57	0.002845	0.001821
34	0.000354	0.000177	58	0.003122	0.002029
35	0.000380	0.000206	59	0.003420	0.002260
36	0.000408	0.000234	60	0.003741	0.002513
37	0.000437	0.000261	61	0.004084	0.002792
38	0.000470	0.000289	62	0.004452	0.003098
39	0.000507	0.000316	63	0.004844	0.003431
40	0.000549	0.000345	64	0.005261	
41	0.000596	0.000376	65	0.005705	
			66	0.006176	

3. <u>Insured starting from the beginning of annuity payment and spouse[16] (until the insured's death)[17]</u>

a. **Population**

The mortality table is based on the data of Makefet's, CAF's and Nativ[18]'s pensioners. The above data also include pensioners who retired to old age pension as well as pensioners who retired to old age after disability.

b. **Calculation method**

The table was calculated based on "amounts" regarding the annuity level.[19]

c. **Adjustment for healthy insureds only**[20]

The mortality rates in the table mentioned in Clause 3a. above, were multiplied by the rates in Table 6 of the position paper.

d. **Spread for possible random deviations and deviations stemming from the composition of insureds' population**

The adjusted mortality rates in the table mentioned in Clause 2c. above, were adjusted downward by 4% as per Appendix B to the position paper.

e. **Table B2 of adjusted mortality rates**

The adjusted mortality rates as stated in Clause 3.c and 3d. above are presented in Table B2 hereinafter.

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[16] In this appendix, "the beginning of annuity payment" - regarding insureds for whom the annuity payment has not started yet – means the future expected date for annuity payment; and regarding insureds for whom the annuity payment has already started - the actual date for annuity payment.

[17] In this appendix, "the insured's death" - for deceased insureds – means actual date of death; and for insureds who are still alive - their expected future date of death.

[18] Based on information received from sources related to pension funds:

- Makefet and CAF are characterized mainly by pensioners who retired from "white-collar" work. In Nativ, the weight of pensioners who retired from "white collar" work may be similar to the weight of pensioners who retired from "blue collar" work.
- Total pension for pensioners who receive old age pension in Makefet and CAF together is approximately 4 times of total pension of pensioners receiving old age pension in Nativ, as of the end of 2004.
- We found similar mortality rates among pensioners of the three pension funds mentioned above.

[19] In the calculation of mortality rate, for each age and gender separately, there is a larger weight for insureds with higher insured wage.

[20] The adjustment described in this paragraph was created for life assurance policies that on the date of their issuance were immediate annuity policies. Regarding policies that on the date of their issuance were deferred annuity policies, allegedly we may claim that the longer the deferral period is, the less appropriate is the above mentioned adjustment. However, even the spread described in Appendix 3 below was created for immediate annuity policies, and for deferred annuity policies, allegedly we may claim that the longer the future deferral period is, the above mentioned spread is less sufficient. Therefore, until the above mentioned spread is adjusted for insurance policies for deferred annuity, we must take into account the adjustment described in this paragraph both for immediate annuity policies and for deferred annuity policies.

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Table B2
Basic mortality rates as of December 31st, 2001
For insureds starting from the beginning of annuity payment and for spouses (until the insured's death)

Age	Male	Female		Age	Male	Female
55		0.001282		83	0.072564	0.056253
56		0.001468		84	0.080860	0.063724
57		0.001680		85	0.090065	0.072099
58		0.001923		86	0.100109	0.081401
59		0.002200		87	0.111199	0.091768
60	0.005817	0.002517		88	0.123417	0.103285
61	0.006418	0.002905		89	0.136845	0.116041
62	0.007085	0.003352		90	0.151562	0.130118
63	0.007826	0.003866		91	0.167390	0.145432
64	0.008649	0.004457		92	0.184593	0.162174
65	0.009564	0.005138		93	0.203217	0.180393
66	0.010736	0.005899		94	0.223294	0.200120
67	0.012054	0.006770		95	0.244835	0.221367
68	0.013539	0.007768		96	0.254113	0.232209
69	0.015211	0.008910		97	0.263390	0.243051
70	0.017094	0.010216		98	0.272668	0.253893
71	0.019128	0.011698		99	0.281946	0.264735
72	0.021412	0.013390		100	0.291223	0.275578
73	0.023976	0.015319		101	0.300501	0.286420
74	0.026854	0.017518		102	0.309779	0.297262
75	0.030084	0.020022		103	0.319056	0.308104
76	0.033602	0.022843		104	0.328334	0.318947
77	0.037538	0.026046		105	0.337612	0.329789
78	0.041941	0.029679		106	0.346889	0.340631
79	0.046865	0.033795		107	0.356167	0.351473
80	0.052367	0.038451		108	0.365445	0.362316
81	0.058391	0.043692		109	0.374722	0.373158
82	0.065100	0.049602		110 and up	0.384000	0.384000

4. <u>Spouses of deceased insureds, starting from the insured's death</u>[21]

a. **Population**

1) Widow: the mortality table is based on the data of widows in the three pension funds Makefet, CAF and Nativ.

2) Widower: the mortality table is based on the data of widowers in the six pension funds.

b. **Calculation method**

The table was calculated based on "amounts" regarding the annuity level.[22]

c. **Spread for possible random deviations and deviations stemming from the composition of insureds' population**

The adjusted mortality rates in the table mentioned in Clause 4a. above, were adjusted downward by 4% as per Appendix B to the position paper.

e. **Table B3 of adjusted mortality rates**

The adjusted mortality rates as stated in Clause 4.c and 3d. above are presented in Table B3 hereinafter.

[21] In this appendix, "the insured's death" - for deceased insureds – means actual date of death; and for insureds who are still alive - their expected future date of death.

[22] In the calculation of mortality rate, for each age and gender separately, there is a larger weight for insureds with higher insured wage.

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Table B3
Basic mortality rates as of December 31st, 2001
For spouses of deceased insureds starting from the insured's death

Age	Widower	Widow		Age	Widower	Widow
55		0.001325		83	0.081184	0.062976
56		0.001551		84	0.089048	0.070501
57		0.001813		85	0.097634	0.078753
58		0.002117		86	0.106996	0.087770
59		0.002469		87	0.117185	0.097591
60	0.009802	0.002875		88	0.128256	0.108248
61	0.010712	0.003344		89	0.140261	0.119769
62	0.011710	0.003883		90	0.153247	0.132177
63	0.012807	0.004503		91	0.167262	0.145486
64	0.014013	0.005215		92	0.182344	0.159703
65	0.015338	0.006031		93	0.198527	0.174822
66	0.016794	0.006964		94	0.215832	0.190831
67	0.018395	0.008030		95	0.234273	0.207705
68	0.020155	0.009246		96	0.244255	0.219458
69	0.022092	0.010630		97	0.254237	0.231211
70	0.024221	0.012203		98	0.264219	0.242964
71	0.026563	0.013987		99	0.274200	0.254717
72	0.029138	0.016006		100	0.284182	0.266470
73	0.031971	0.018288		101	0.294164	0.278223
74	0.035086	0.020862		102	0.304146	0.289976
75	0.038511	0.023758		103	0.314128	0.301729
76	0.042276	0.027011		104	0.324109	0.313482
77	0.046412	0.030655		105	0.334091	0.325235
78	0.050956	0.034729		106	0.344073	0.336988
79	0.055944	0.039272		107	0.354055	0.348741
80	0.061416	0.044325		108	0.364036	0.360494
81	0.067417	0.049931		109	0.374018	0.372247
82	0.073990	0.056133		110 and up	0.384000	0.384000

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Appendix 2
Best Estimate[23] -type assumption regarding the decrease rate in mortality rates after December 31st, 2001

1. The rate of decrease in mortality rates after December 31st, 2001 shall be calculated in the following manner:

$$\frac{q_{x,t}}{q_{x,o}} = \alpha_x + (1-\alpha_x)\times(1-f_x)^{t/20}$$

2. For this matter

α_x - as per the rate in Table B4 below:

f_x - as per the rate in Table B4 below;

x - age;

t - the number of years elapsed since December 31st, 2001

$q_{x,0}$ - mortality rate at age x as of December 31st, 2001

$q_{x,t}$ - mortality rate at age x at t

3. The above mentioned rate of decrease was applied to the basic mortality rates presented in Tables B1, B2 and B3 above.

4. Sources
   a. The formula in Clause 1 above - Faculty and Institute of Actuaries Continuous Mortality Investigation Reports.
   b. Table B4 - position paper

5. Illustration
   Enclosed please find an illustration of the usage of the formula from Clause 1 and Table B4, taking into account the calculation of reserves for annuity payment as of December 31st, 2006 for a male insured aged 77 at the time:
   a. As of December 31st, 2006 t equals 5 and x equals 77;
   b. Inter alia, values of $q_{77,5}$ and $q_{78,6}$ are required.
   c. As per the formula, the following should be calculated

$$\frac{q_{77,5}}{q_{77,0}} = \alpha_{77} + (1-\alpha_{77})\times(1-f_{77})^{5/20}$$

   i.e., $q_{77,5} = \{\ \alpha_{77} + (1-\alpha_{77})\times(1-f_{77})^{5/20}\ \}\times q_{77,0}$

   d. $q_{77,0}$ equals 0.037538 as per Table B2 above. Since the insured is a male born before 1931, α_{77} equals 0.3866 and f_{77} equals 0.4733 as per Table B4 hereinafter.
   e. Thus, $q_{77,5}$ equals 0.034128.
   f. In the same way, $q_{78,6} = \{\ \alpha_{78} + (1-\alpha_{78})\times(1-f_{78})^{6/20}\ \}\times q_{78,0}$

[23] For this matter, Best Estimate assumption - means the best estimate, as of a specific point in time and as per the discretion of a specific professional entity, that does not take into account possible random deviations, arising from possible imprecisions in the measurement, possible negative scenarios, flaws in other assumptions or due to expenses.

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Table B4
Best Estimate type assumption regarding the decrease rate in mortality rates after December 31st, 2001

Female						
Age	α	f		Age	α	f
Up to 30	0.3243	0.4919		66	0.2511	0.5138
31	0.3243	0.4919		67	0.2511	0.5138
32	0.3243	0.4919		68	0.2511	0.5138
33	0.3243	0.4919		69	0.2511	0.5138
34	0.3243	0.4919		70	0.2511	0.5138
35	0.3243	0.4919		71	0.2511	0.5138
36	0.3243	0.4919		72	0.2511	0.5138
37	0.3243	0.4919		73	0.2684	0.5086
38	0.3243	0.4919		74	0.2684	0.5086
39	0.3243	0.4919		75	0.2864	0.5033
40	0.3243	0.4919		76	0.2864	0.5033
41	0.3243	0.4919		77	0.3050	0.4977
42	0.3243	0.4919		78	0.3243	0.4919
43	0.3050	0.4977		79	0.3443	0.4860
44	0.2864	0.5033		80	0.3651	0.4797
45	0.2511	0.5138		81	0.3866	0.4733
46	0.2342	0.5188		82	0.4091	0.4666
47	0.2180	0.5237		83	0.4324	0.4596
48	0.2180	0.5237		84	0.4568	0.4523
49	0.2180	0.5237		85	0.4822	0.4447
50	0.2180	0.5237		86	0.5089	0.4368
51	0.2180	0.5237		87	0.5368	0.4284
52	0.2180	0.5237		88	0.5661	0.4197
53	0.2180	0.5237		89	0.5970	0.4104
54	0.2180	0.5237		90	0.6296	0.4007
55	0.2022	0.5284		91	0.6642	0.3903
56	0.2022	0.5284		92	0.7011	0.3793
57	0.2022	0.5284		93	0.7405	0.3676
58	0.2022	0.5284		94	0.7405	0.3676
59	0.2180	0.5237		95	0.7829	0.3549
60	0.2180	0.5237		96	0.7829	0.3549
61	0.2342	0.5188		97	0.8290	0.3411
62	0.2342	0.5188		98	0.8290	0.3411
63	0.2342	0.5188		99	0.8796	0.3260
64	0.2342	0.5188		100	0.8796	0.3260
65	0.2511	0.5138		101 and up	0.9359	0.3092

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Table B4 (Continued)
Best Estimate type assumption regarding the decrease rate in mortality rates after December 31st, 2001

Male born between 1931-1949						
Age	α	f		Age	α	f
Up to 30				66	0.2684	0.5086
31				67	0.2684	0.5086
32				68	0.2684	0.5086
33				69	0.2684	0.5086
34				70	0.2864	0.5033
35				71	0.2864	0.5033
36				72	0.2864	0.5033
37				73	0.2864	0.5033
38				74	0.2864	0.5033
39				75	0.3050	0.4977
40				76	0.3050	0.4977
41				77	0.3050	0.4977
42				78	0.3243	0.4919
43				79	0.3651	0.4797
44				80	0.3866	0.4733
45				81	0.4324	0.4596
46				82	0.4568	0.4523
47				83	0.4822	0.4447
48				84	0.5089	0.4368
49				85	0.5661	0.4197
50				86	0.5970	0.4104
51				87	0.6296	0.4007
52	0.2864	0.5033		88	0.6642	0.3903
53	0.2684	0.5086		89	0.7011	0.3793
54	0.2511	0.5138		90	0.7011	0.3793
55	0.2342	0.5188		91	0.7405	0.3676
56	0.2180	0.5237		92	0.7829	0.3549
57	0.2022	0.5284		93	0.7829	0.3549
58	0.2180	0.5237		94	0.8290	0.3411
59	0.2180	0.5237		95	0.8290	0.3411
60	0.2342	0.5188		96	0.8796	0.3260
61	0.2342	0.5188		97	0.8796	0.3260
62	0.2511	0.5138		98	0.8796	0.3260
63	0.2511	0.5138		99	0.8796	0.3260
64	0.2511	0.5138		100	0.9359	0.3092
65	0.2684	0.5086		101 and up	0.9359	0.3092

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Table B4 (Continued)
Best Estimate type assumption regarding the decrease rate in mortality rates after December 31st, 2001

Male born before 1931 or from 1950 and on						
Age	α	f		Age	α	f
Up to 30	0.4324	0.4596		66	0.3866	0.4733
31	0.4324	0.4596		67	0.3866	0.4733
32	0.4324	0.4596		68	0.3866	0.4733
33	0.4324	0.4596		69	0.3866	0.4733
34	0.4324	0.4596		70	0.3866	0.4733
35	0.4324	0.4596		71	0.3866	0.4733
36	0.4324	0.4596		72	0.3866	0.4733
37	0.4324	0.4596		73	0.3866	0.4733
38	0.4324	0.4596		74	0.3866	0.4733
39	0.4324	0.4596		75	0.3866	0.4733
40	0.4324	0.4596		76	0.3866	0.4733
41	0.4324	0.4596		77	0.3866	0.4733
42	0.4324	0.4596		78	0.4091	0.4666
43	0.4091	0.4666		79	0.4324	0.4596
44	0.3866	0.4733		80	0.4568	0.4523
45	0.3443	0.4860		81	0.4822	0.4447
46	0.3243	0.4919		82	0.5089	0.4368
47	0.3050	0.4977		83	0.5368	0.4284
48	0.3050	0.4977		84	0.5661	0.4197
49	0.3050	0.4977		85	0.5970	0.4104
50	0.2864	0.5033		86	0.6296	0.4007
51	0.2864	0.5033		87	0.6642	0.3903
52	0.2864	0.5033		88	0.7011	0.3793
53	0.3050	0.4977		89	0.7011	0.3793
54	0.3050	0.4977		90	0.7405	0.3676
55	0.3243	0.4919		91	0.7405	0.3676
56	0.3243	0.4919		92	0.7829	0.3549
57	0.3443	0.4860		93	0.7829	0.3549
58	0.3443	0.4860		94	0.8290	0.3411
59	0.3651	0.4797		95	0.8290	0.3411
60	0.3651	0.4797		96	0.8796	0.3260
61	0.3866	0.4733		97	0.8796	0.3260
62	0.3866	0.4733		98	0.8796	0.3260
63	0.3866	0.4733		99	0.8796	0.3260
64	0.3866	0.4733		100	0.9359	0.3092
65	0.3866	0.4733		101 and up	0.9359	0.3092

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Appendix 3
Spread due to longevity risk

1. **Male**
   In addition to the Best Estimate assumption[24] regarding decreases in mortality rates, as presented in Appendix 2 above, additional declines in mortality rates of 0.38% per year for 33 years starting from December 31st, 2005 will be factored in, taking into account Appendix F to the position paper.

2. **Female**
   In addition to the Best Estimate assumption[25] regarding decreases in mortality rates, as presented in Appendix 2 above, additional declines in mortality rates of 0.38% per year for 65 years starting from December 31st, 2005 will be factored in, taking into account Appendix F to the position paper.

[24] For this matter, Best Estimate assumption - means the best estimate, as of a specific point in time and as per the discretion of a specific professional entity, that does not take into account possible random deviations, arising from possible imprecisions in the measurement, possible negative scenarios, flaws in other assumptions or due to expenses.

[25] For this matter, Best Estimate assumption - means the best estimate, as of a specific point in time and as per the discretion of a specific professional entity, that does not take into account possible random deviations, arising from possible imprecisions in the measurement, possible negative scenarios, flaws in other assumptions or due to expenses.