

INTEREST RATE RISK AND MARKET RISK

LR024

Basis of Factors

The interest rate risk is the risk of losses due to changes in interest rate levels. The factors chosen represent the surplus necessary to provide for a lack of synchronization of asset and liability cash flows.

The impact of interest rate changes will be greatest on those products where the guarantees are most in favor of the policyholder and where the policyholder is most likely to be responsive to changes in interest rates. Therefore, risk categories vary by withdrawal provision. Factors for each risk category were developed based on the assumption of well matched asset and liability durations. A loading of 50 percent was then added on to represent the extra risk of less well-matched portfolios. Companies must submit an unqualified actuarial opinion based on asset adequacy testing to be eligible for a credit of one-third of the RBC otherwise needed.

Consideration is needed for products with credited rates tied to an index, as the risk of synchronization of asset and liability cash flows is tied not only to changes in interest rates but also to changes in the underlying index. In particular, equity-indexed products have recently grown in popularity with many new product variations evolving. The same C-3 factors are to be applied for equity-indexed products as for their non-indexed counterparts; i.e., based on guaranteed values ignoring those related to the index.

In addition, some companies may choose to or be required to calculate part of the RBC on Certain Annuities under a method using cash flow testing techniques. Refer to LR043 Exemption Test: Cash Flow Testing for C-3 RBC for determination of exemption from this cash flow testing requirement.

Reserves on Certain Annuities that were Cash Flow Tested for Asset Adequacy – Factor-Based RBC

See Appendix 1 of the instructions for more details.

The risk categories are:

(a) Low-Risk Category

The basic risk-based capital developed for annuities and life insurance in the low-risk category was based on an assumed asset/liability duration mismatch of 0.125 (i.e., a well matched portfolio). This durational gap was combined with a possible 4 percent one-year swing in interest rates (the maximum historical interest rate swing 95 percent of the time) to produce a pre-tax factor of 0.0077. In addition to the 50 percent loading discussed above, the risk-based capital pre-tax factor is 0.0115.

(b) Medium and High-Risk Category

The factors for the medium and high-risk categories were determined by measuring the value of the additional risk from the more discretionary withdrawal provisions based on assumptions of policyholder behavior and 1,000 random interest rate scenarios. Supplementary contracts not involving life contingencies and dividend accumulations are included in the medium-risk category due to the historical tendency of these policyholders to be relatively insensitive to interest rate changes.

Additional Component for Callable/Pre-Payable Assets

Identify the amount of callable/pre-payable assets (including IOs and similar investments) supporting reserves classified in this section. The C-3 requirement after taxes is 50 percent of the excess, if any, of book/adjusted carrying value above current call price. The calculation is done on an asset-by-asset basis. NOTE: If a company is required to calculate part of the RBC based on cash flow testing for C-3 RBC, the callable/pre-payable assets adjustment for any such assets used in that testing is reversed in a later step of the calculation.

All Other Reserves

This captures all reserves not included in Reserves on Certain Annuities that were Cash Flow Tested or products included under the “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products” or the “Recommended Approach for Setting Risk-Based Capital for Life Insurance Products.”

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The factors for the medium and high-risk categories were determined by measuring the value of the additional risk from the more discretionary withdrawal provisions based on assumptions of policyholder behavior and 1,000 random interest rate scenarios. Supplementary contracts not involving life contingencies and dividend accumulations are included in the medium-risk category due to the historical tendency of these policyholders to be relatively insensitive to interest rate changes.

Additional Component for Callable/Pre-Payable Assets

Identify the amount of callable/pre-payable assets (including IOs and similar investments) not reported for Reserves on Certain Annuities that were Cash Flow Tested or the Interest Rate Risk Component for products included under the “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products” or the Interest Rate Risk Component for products included under the “Recommended Approach for Setting Risk-Based Capital for Life Insurance Products.” This includes callable/pre-payable assets supporting other reserves and capital and surplus. The C-3 requirement after taxes is 50 percent of the excess, if any, of book/adjusted carrying value above current call price. The calculation is done on an asset-by-asset basis and reported in aggregate.

Cash Flow Testing for C-3 RBC

A company may be required or choose to perform cash flow testing to determine its RBC requirement. Because of the widespread use of increasingly well-disciplined scenario testing for actuarial opinions based upon an asset adequacy analysis involving cash flow testing, it was determined that a practical method of measuring the degree of asset/liability mismatch existed. It involves further cash flow testing. See Appendix 1 – Cash Flow Testing for C-3 RBC for details.

Specific Instructions for Application of the Formula

Lines (2) through (16)

These lines deal with Certain Annuities and Single Premium Life Insurance for which reserves were cash flow tested for asset adequacy. The fixed portion of equity-based variable products should not be included. Guaranteed indexed separate accounts following a Class I investment strategy are reported as low-risk Line 2 and those following a Class II investment strategy are excluded. Company source records entered in Column (3) of Lines (13), (15) and (16) should be adjusted to a pre-tax basis.

Line (17) Should equal the sum of Lines (6) + (11) + (14) + (15). Line (16) is not included in the Line (17) total. Instead, it is included in the Line (32) total.

Lines (18) through (31)

These lines cover:

- (a) The remaining company business that was not cash flow tested for asset adequacy (see Appendix 1 for details) excluding products included under the “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products” and
- (b) Business in companies that did not cash flow test for asset adequacy.

The calculation for risk-based capital should not include unitized separate accounts without guarantees even though they may be included in Item 32 of the Notes to Financial Statements. Separate accounts with guarantees should be included, except for those separate accounts that guarantee an index and follow a Class II investment strategy and certain other guaranteed separate accounts as defined below. Synthetic GICs net of certain credits should be included in this section. The provisions for these credits to C-3 requirements is provided in the Separate Accounts section of the risk-based capital instructions. Experience-rated pension contracts defined below should be excluded from “annuity reserves with fair value adjustment” and “annuity reserves not withdrawable.” All amounts should be reported net of reinsurance, net of policy loans and adjusted for assumed and ceded modified coinsurance.

Experience-rated group and individual pension business that meets all of the following four conditions is excluded from C–3 factor-based risk:

- (a) General account funded;
- (b) Reserve interest rate is carried at no greater than 4 percent and/or fund long-term interest guarantee (in excess of a year) does not exceed 4 percent;
- (c) Experience rating mechanism is immediate participation, retroactive credits, or other technique other than participating dividends; and
- (d) Either is not subject to discretionary withdrawal or is subject to fair value adjustment, but only if the contractually defined lump sum fair value adjustment reflects portfolio experience as well as current interest rates and is expected to pass both credit risk and rate risk to the policyholder at withdrawal. (A lump sum settlement based only on changes in prevailing rates does not meet this test. Book value cash out options meet this test as long as the present value of payments using U.S. Treasury spot rates is less than or equal to the lump sum fair value on the valuation date and the policyholder does not have an option to change the payment period once payments begin.)

For companies not exempt from cash flow testing for C-3 RBC, such testing is to include those experience-rated products exempted from the formula factors, but for which cash flow testing is done as a part of the asset adequacy testing.

Non-indexed separate account business with guarantees that satisfy both conditions (b) and (d) above is excluded from C–3 factor-based risk.

Guaranteed indexed separate account business following a Class I investment strategy is reported on Line (18). Note that in the AAA Report “Proposed New Risk-Based Capital Method for Separate Accounts That Guarantee an Index (adopted by the NAIC Life Risk-Based Capital Working Group in New York, NY, June 2003), there is a stress test applicable to Class I investment strategies for a company that is not subject to scenario testing requirements.

Company source records entered in Column (3) of Lines (30) and (31) should be adjusted to a pre-tax basis.

Line (33)

Enter in Column (3) the pre-tax interest rate risk results of cash flow testing per the Appendix 1a methodology. Line (33) should be completed by all companies who do cash flow testing of Certain Annuities for asset adequacy (see Appendix 1) except those with less than \$100 million in admitted assets at the reporting date, unless the answer to Line (14) or Line (22) of LR043 Exemption Test: Cash Flow Testing for C-3 RBC is “Yes” or if the company chooses to do C-3 RBC cash flow testing on a continuing basis. Once a company chooses to use the C-3 RBC cash flow testing method to calculate RBC it must continue to do so unless regulatory approval from the domiciliary jurisdiction is received to go back to the factor-based method. The interest rate risk component for Variable Annuities and Similar Products and Life Insurance Products included under the Recommended Approach should be entered into Line (35).

Line (34)

If Line (33) is equal to zero, then Line (34) should equal Line (32). Otherwise, Line (34) should equal Line (32) plus Line (33) less Line (16) less Line (17) subject to a minimum of 0.5 times Line (32).

Line (35)

Line (35) is the sum of the interest rate risk component for Variable Annuities and Similar Products, and the interest rate risk component for Life Insurance Products.

The interest rate risk component for Variable Annuities and Similar Products should be determined on a pre-tax basis and added to the interest rate risk component for Life Insurance Products which should also be determined on a pre-tax basis.

Line (36)

Total interest rate risk. Equals Line (34) plus Line (35)

Line (37)

Line (37) is the sum of the market risk component for Variable Annuities and Similar Products, and the market risk component for Life Insurance Products less an adjustment for market risks already included in the factor-based C1cs or C0 component.

The market risk component for Variable Annuities and Similar Products, the market risk component for Life Insurance Products and the adjustment for market risks already included in the factor-based C1cs or C0 component should each be determined on a pre-tax basis.

Specifications for the calculation of the market risk component for Variable Annuities and Similar Products, the market risk component for Life Insurance Products and the adjustment for market risks already included in the factor-based C1cs component are given in the following sections respectively.

Variable Annuities and Similar Products

The amount reported on Line (37) relating to Variable Annuities and Similar Products is calculated using a nine-step process.

(1) The first step is determined by applying the methodology described in the report “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products Presented by the American Academy of Actuaries’ Life Capital Adequacy Subcommittee to the National Association of Insurance Commissioners’ Capital Adequacy Task Force (June 2005)” to calculate the total asset requirement. Although Appendix 2 in the Report notes path dependent models under a different set of initialization parameters might produce scenarios that do not satisfy all the calibration points shown in Table 1, to be in compliance with the requirements in this first step, the actual scenarios used for diversified U.S. equity funds must meet the calibration criteria. The scenarios need not strictly satisfy all calibration points in Table 1 of Appendix 2, but the actuary should be satisfied that any differences do not materially reduce the resulting capital requirements. See the Preamble to the *Accounting Practices and Procedures Manual* for an explanation of materiality. Include the Tax Adjustment as described in the report.

(2) The second step is to reduce the amount calculated in (1) above by the interest rate portion of the risk (i.e. only the separate account market risk is included in this step).

(3) The third step is to calculate the Standard Scenario Amount.

(4) Take the greater of the amounts from steps (2) and (3).

(5) Apply the smoothing and transition rules (if applicable) to the amount in step (4).

(6) Add the general account interest rate portion of the risk to the amount in step (5).

(7) Subtract the reported statutory reserves for the business subject to the Report from the amount calculated in step (6). Floor this amount at \$0.

(8) Divide the result from step (7) by .65 to arrive at a pre-tax amount.

(9) Split the result from step (8) into an interest rate risk portion and a market risk portion. Note that the interest rate portion may not equal the interest rate portion of the risk used in steps (2) and (6) above even after adjusting these to a pre-tax basis. The interest rate portion of the risk should be included in Line (35) and the market risk portion in Line (37).

Smoothing and Transition Rules

If a company is following a Clearly Defined Hedging Strategy (See “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products Presented by the American Academy of Actuaries’ Life Capital Adequacy Subcommittee to the National Association of Insurance Commissioner’s Capital Adequacy Task Force (June 2005)” for the definition of this phrase) on some or all of its business, a decision should be made whether or not to smooth the TAR. In all cases where ‘cash value’ is to be used, the values used must be computed on a consistent basis for each block of business at successive year-ends. For deferred annuities with a cash value option, direct writers will use the cash value. For deferred annuities with no cash value option, or for reinsurance assumed through a treaty other than coinsurance, use the policyholder account value of the underlying contract. For payout annuities, or other annuities with no account value or cash value, use the amount as defined for variable payout annuities in the definition of Working Reserve. For any business reinsured under a coinsurance agreement that complies with all applicable reinsurance reserve credit “transfer of risk” requirements, the ceding company shall reduce the value in proportion to the business ceded while the assuming company shall use an amount consistent with the business assumed.

A company who reported an amount in Line (37) last year may choose to smooth the Total Asset Requirement. A company is required to get approval from its domestic regulator prior to changing its decision about smoothing from the prior year. To implement smoothing, use the following steps. If a company does not qualify to smooth or a decision has been made not to smooth, go to the step “Reduction for reported Statutory Reserves”.

Instructions

1. Determine the Total Asset Requirement as the greater of that produced by the “Recommended Approach for Setting Risk-Based Capital Requirements for Variable Annuities and Similar Products Presented by the American Academy of Actuaries’ Life Capital Adequacy Subcommittee to the National Association of Insurance Commissioner’s Capital Adequacy Task Force (June 2005)” or the value produced by the “Standard Scenario” as outlined above.
2. Determine the aggregate cash value for the contracts covered by the Stochastic modeling requirements.
3. Determine the ratio of TAR / CV for current year.
4. Determine the Total Asset Requirement as actually reported for the prior year Line (35).
5. Determine the aggregate cash value for the same contracts for the prior year-end.
6. Determine the ratio of TAR / CV for prior year
7. Determine a ratio as $.4*(6) \text{ plus } .6*(3)$ {40% prior year ratio and 60% current year ratio}
8. Determine TAR for current year as the product of (7) and (2) {adjust (2) to be actual 12/31 cash value}

Reduction for reported statutory reserves

The amount of the TAR (post-Federal Income Tax) determined using the instructions for the applicable year is reduced by the reserve, net of reinsurance, for the business subject to this instruction reported in the current statutory annual statement.

Allocation of Results to Line (35) and Line (37)

See step (9) located at the beginning of the instructions relating to [Variable Annuities and Similar Products for the allocation of results to Line \(35\) and Line \(37\)](#).

Life Insurance Products

The amount reported on Line (37) relating to Life Insurance Products is calculated using a four step process:

- (1) The first step is to calculate the C-3 amount by applying the methodology described in the American Academy of Actuaries' C3 Life and Annuity Capital Work Group report, "Report of the American Academy of Actuaries' C3 Life and Annuity Capital Work Group Presented to the National Association of Insurance Commissioners' Life Risk Based Capital Work Group (September 2008)."
- (2) The second step is to reduce the amount in step (1) above by an adjustment for market risks already included in the Factor-based C1cs, as described below. The reduced amount may not be less than zero.
- (3) The third step is to reduce the amount calculated in (2) above by the interest rate portion of the risk (i.e., only the market risk is included in this step). The reduced amount may not be less than zero.
- (4) Divide the result from step (3) by .65 to arrive at a pre-tax amount.

The result in step 4 above is added to the amount on line (37), if any, relating to Variable Annuities and Similar Products.

The amount reported on Line (35) relating to Life Insurance Products is determined as the interest rate portion of the risk divided by .65 to arrive at a pre-tax amount. This amount is added to the amount on line (35), if any, relating to Variable Annuities and Similar Products.

Adjustment For Market Risks Already Included in the Factor-based C1cs Component

An adjustment is to be made to recognize the double-counting of risk between the C1cs component and the market risk component for Life Insurance Products computed above. The adjustment reverses the factor-based C1cs relating to existing equity assets that are included in the determination of the market risk component for Life Insurance Products.

The adjustment is determined by applying the applicable risk factors to the applicable amount of assets included in the models in determining the market risk component for Life Insurance Products. The source of the risk factor to be applied and line items that include the asset amounts are given in the table below.

For amounts included in this adjustment, the actuary who certifies the RBC amount must be reasonably certain that the risk that LR005 and LR008 respectively are attempting to measure are captured in the principles-based C-3 amount determined, and that the amount of such assets in the adjustment is not greater than the statutory value of such assets included in the models underlying the principles-based C-3 amount.

	<u>Asset Class</u>	<u>Amount</u>	<u>Factor</u>
1	Admitted Unaffiliated Private Common Stock	LR005 line (17) in column (1) [in part]	LR005 line (23) in column (4)
2	Admitted Unaffiliated Private Common Stock	LR008 line (43) in column (1) [in part]	LR008 line (43) in column (4)
3	Admitted Unaffiliated Public Common Stock	LR005 line (23) in column (1) [in part]	LR005 line (24) in column (4)
4	Admitted Unaffiliated Public Common Stock	LR008 line (42) in column (1) [in part]	LR008 line (42) in column (4)

The total of all Annual Statement reserves representing exposure to C-3 risk on Line (36) should equal the following:

Exhibit 5, Column 2, Line 0199999

– Page 2, Column 3, Line 6

+ Exhibit 5, Column 2, Line 0299999

+ Exhibit 5, Column 2, Line 0399999

+ Exhibit 7, Column 1, Line 14

+ Separate Accounts Page 3, Column 3, Line 1 plus Line 2 after deducting (a) funds in unitized separate accounts with no underlying guaranteed minimum return and no unreinsured guaranteed living benefits; (b) non-indexed separate accounts that are not cash flow tested with guarantees less than 4 percent; (c) non-cash-flow-tested experience rated pension reserves/liabilities; and (d) guaranteed indexed separate accounts using a Class II investment strategy.

– Non policyholder reserves reported on Exhibit 7

+ Exhibit 5, Column 2, Line 0799997

+ Schedule S, Part 1, Section 1, Column 11

– Schedule S, Part 3, Section 1, Column 13