Advisory

Title	Revised Guidance for Companies that Determine Segregated Fund Guarantee Capital Requirements Using an Approved Model
Category	Capital Adequacy Requirements
Date	December 31, 2010
Sector	Life Insurance and Fraternal Companies
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Note:

Advisories describe how OSFI administers and interprets provisions of existing legislation, regulations or guidelines, or provide OSFI's position regarding certain policy issues. Advisories are not law; readers should refer to the relevant provisions of the legislation, regulation or guideline, including any amendments that came into effect subsequent to the Advisory's publication, when considering the relevancy of the Advisory.

This Advisory prescribes new minimum calibration criteria for models that OSFI has approved for use in determining segregated fund guarantee capital requirements by federally regulated life insurers. This revised guidance will apply to segregated fund guarantee capital requirements for business written on or after January 1, 2011. The existing calibration criteria will continue to apply to business written prior to January 1, 2011 until a new approach, which is consistent with the vision for life insurance company capital previously enunciated, is developed and implemented.

For segregated fund products with guarantees based on the date of deposit and where there are separate guarantee periods for different deposits within the same policy, "business written on or after January 1, 2011" includes deposits made to existing policies on or after January 1, 2011. Companies with other types of segregated fund guarantee products should contact OSFI if they require clarification on what constitutes "business written on or after January 1, 2011."

This Advisory complements the following OSFI guidance:

- Guideline A: *Life Insurance Capital Adequacy Test* (LICAT)
- Instruction Guide: *Use of Internal Models for Determining Required Capital for Segregated Fund Risks (LICAT)* (Use of Models)
- Advisory: *Supplementary Information for Life Insurance Companies that Determine Segregated Fund Guarantee Capital Requirements Using an Approved Model – Revised Version*

Background

Section 2.1.2 of the March 2002 report of the Canadian Institute of Actuaries (CIA) Task Force on Segregated Fund Investment Guarantees (CIA document 202012) contains a set of calibration criteria for segregated fund guarantee models. As part of the validation process for an internal model used for regulatory capital purposes, section 8.F(g) of OSFI's Use of Models instruction guide requires that models comply with the CIA calibration criteria as a necessary condition for approval.

The existing CIA calibration criteria are based on the performance of the TSX total return index from January 1956 to December 1999. These criteria were developed at a time when the majority of exposure in segregated fund guarantee products was to large capitalization Canadian equities. Since that time, product offerings have evolved to the point that there is now significant exposure to US and international equities, small and mid capitalization equities and bonds.

Accordingly, OSFI is revising the minimum calibration criteria for the investment return scenarios used to determine segregated fund guarantee total requirements to better capture the risks in current segregated fund guarantee product offerings and ensure that equity return experience since 1999, as well for periods prior to 1956, is appropriately reflected. The new calibration criteria define minimum statistical characteristics that the scenarios actually used in the determination of the total requirement must have.

Equity Index Calibration Criteria

New minimum quantitative calibration criteria are mandated for the scenarios used to model the returns of the following total return equity indexes (henceforth referred to as "listed indexes"):

- TSX
- Canadian small cap equity, mid cap equity and specialty equity
- S&P 500
- US small cap equity, mid cap equity and specialty equity
- MSCI World Equity and MSCI EAFE

The actual investment return scenarios for each of the listed indexes used in the determination of total requirements must meet the criteria specified in the following table.

Left tail criteria	Time Period of 6 months	Time Period of 1 year
2.5th percentile of return not greater than	-25%	-35%
5th percentile of return not greater than	-18%	-26%
10th percentile of return not greater than	-10%	-15%

Right tail criteria	Time Period of 6 months	Time Period of 1 year
90th percentile of return not less than	20%	30%
95th percentile of return not less than	25%	38%
97.5th percentile of return not less than	30%	45%

Furthermore, the arithmetic average of the actual investment return scenarios for each listed index over any one-year period (including the one-year period starting on the valuation date) cannot be greater than 10%. All of these criteria must be met for the scenarios of a listed index to be in accordance with the new minimum calibration criteria.

Modeled scenarios of TSX total return indexes must continue to satisfy the CIA calibration criteria at all percentiles over the five- and ten-year time horizons as published in the CIA's March 2002 report, in addition to the criteria above. Modeled scenarios of S&P 500 total return indexes must satisfy the American Academy of Actuaries' calibration criteria for equities [1] at all percentiles over the five-, ten- and twenty-year time horizons, in addition to the criteria above.

The scenarios used to model returns of an equity index that is not one of the listed indexes need not meet the same calibration criteria, but must still be consistent with the calibrated scenarios used to model the returns of the listed indexes.

Correlation

The scenarios used to model returns for different equity indexes should be positively correlated with one another. Unless it can be justified otherwise, the correlation between the returns generated for any two equity indexes (whether or not they are listed) should be at least 70%. If scenarios are generated using a model that distinguishes between positive and negative trend market phases (e.g. the regime-switching lognormal model with two regimes) then, unless it can be justified otherwise, the scenarios should be such that there is a very high probability that different equity indexes will be in the same market phase at the same time, and a very low probability that different equity indexes will be in different phases at the same time.

Bond Index Calibration Criteria

New minimum quantitative calibration criteria are mandated for the scenarios used to model total return bond indexes that track the performance of Canadian government, US government, or investment grade corporate bonds. The actual investment return scenarios for each such index used in the determination of total requirements must have the specified characteristics.

Left tail criteria

Upper bounds are placed on the 2.5^{th}, 5^{th} and 10^{th} percentiles of the one-year total returns of the indicated bond indexes. For p = 2.5, 5 and 10, the p^{th} percentile of the total return over one year cannot be greater than

$$r - \max\left[D - \frac{1}{2}, 0\right] \times a_p + b_p - r - d_p$$

where:

- r is the effective per annum yield, at the time of valuation, on a D-year zero-coupon government bond in the currency of the bond index
- D is the duration, measured in years, of the bond index at the time of valuation
- a_p and b_p, as set forth below, are parameters related to the associated p^{th} percentile increase in interest rates

- d_p, as set forth below, is the reduction in the return at percentile p due to credit default and downgrade losses associated with the particular bond index

The values of a_p for a particular percentile depend on the average term to maturity of the bond index. For terms to maturity of 1, 3, 5 and 10 years, the values of a_p are given by the following table:

Percentile	Term to Maturity			
	1 Year a_p	3 Years a_p	5 Years a_p	10 Years a_p
2.5^{th}	2.00%	1.60%	1.20%	0.80%
5^{th}	1.70%	1.35%	1.00%	0.70%
10^{th}	1.30%	1.05%	0.80%	0.50%

The values of b_p are given by the following table:

Percentile	b_p
2.5^{th}	5.00%
5^{th}	4.20%
10^{th}	3.30%

The value of d_p for all government bond indexes is 0. The values of d_p for other credit classes are given by the following tables:

$d_{2.5}$	Term to Maturity			
	1	3	5	10
AAA/AA	0.10%	0.50%	0.75%	1.30%
A	0.30%	0.80%	1.20%	2.00%
BBB	0.80%	2.00%	2.80%	4.00%

d_5	Term to Maturity			
	1	3	5	10
AAA/AA	0.06%	0.30%	0.55%	1.00%
A	0.20%	0.55%	0.85%	1.50%
BBB	0.50%	1.40%	2.00%	3.00%

d_{10}	Term to Maturity			
	1	3	5	10
AAA/AA	0.03%	0.15%	0.30%	0.65%
A	0.10%	0.30%	0.50%	1.00%
BBB	0.30%	0.85%	1.30%	2.00%

For terms to maturity between 1 and 10 years, the values of a_p and d_p are determined by linear interpolation between the nearest terms to maturity in the above tables. For terms to maturity greater than 10 years, the values of a_p and d_p for the 10-year term to maturity are to be used.

For terms to maturity less than 1 year, the values of a_p and d_p for the 1-year term to maturity are to be used. For indexes containing bonds in multiple credit classes, d_p for the index should be calculated as the notional-weighted average of d_p taken over each of the bonds in the index.

Average return criterion

An upper bound is placed on the expected compounded average total return of each of the indicated bond indexes. The arithmetic average of the scenario-specific compounded average returns calculated over the D -year period beginning on the valuation date may not be greater than

$$r + s \quad ,$$

where D and r are defined as before, and s represents the average credit risk premium. The value of s is given by the following table:

Credit Class	s
Government	0.00%
AA or higher	0.85%
A	1.10%
BBB	1.45%

Criteria for other bond indexes

The scenarios used to model returns of a bond index that does not track the performance of Canadian government, US government, or investment grade corporate bonds need not meet the same calibration criteria, but must still be consistent with the calibrated scenarios used to model the returns of these indexes, and must be conservatively determined.

Correlation

The scenarios used to model returns for different bond indexes should be positively correlated with one another. Unless it can be justified otherwise, the correlation between the returns generated for an equity index and a bond index in the same currency should not be greater than 40%.

Companies should take into consideration the limited historical experience with very low interest rate environments when setting assumptions for bond fund models and ensure that their models appropriately capture the risks associated with very low interest rate environments. A company's implementation of the new calibration criteria should not result in less conservative modeling or the use of less conservative scenario sets for bond indexes than is currently the case.

Criteria for Individual Segregated Funds

If weighted averages of modeled indexes are used to calculate the return scenarios for an individual segregated fund (before fee deductions), all of the index return scenarios on which the segregated fund return scenarios are based must meet the above calibration criteria. Companies that do not model segregated fund investment returns (before fee deductions) as weighted averages of index returns should contact OSFI for information on how to calibrate the segregated fund return scenarios.

Calculation of Total Requirement for Exposures Subject to this Advisory

The total requirement for business subject to this Advisory (i.e., for business written on or after January 1, 2011) will be calculated separately from the total requirement for all other segregated fund guarantee business.

The total gross calculated requirement (TGCR) for the segregated fund guarantee exposure as a whole will be the sum of the total requirements for business subject to this Advisory and all other business, where the individual components have been floored at zero before the sum is calculated [2] .

Footnotes

1 For example, as published in the American Academy of Actuaries document entitled Recommended Approach for Setting Regulatory Risk-Based Capital Requirements for Variable Annuities and Similar Products dated June 2005.

2 If, upon and subsequent to the adoption of IFRS 17, the methodology used to determine liabilities subtracted from the TGCR reduces the liability by the amount of deferred acquisition expenses, and the methodology did not reduce the liability by the amount of deferred acquisition costs/expenses prior to the adoption of IFRS 17, then the floor for each component (i.e., pre- and post-2011 business) is set to the negative of the deferred acquisition expense for the business associated with that component instead of zero.