Guideline

Subject: **Minimum Continuing Capital and Surplus Requirements (MCCSR) for Life Insurance Companies**

No: **A** **Date:** **November 2006**

Subsection 515(1) of the Insurance Companies Act (ICA) requires federally regulated life insurance companies and societies to maintain adequate capital. Subsection 608(1) of the ICA requires companies operating in Canada on a branch basis to maintain an adequate margin of assets in Canada over liabilities in Canada. The MCCSR Guideline is not made pursuant to subsections 515(2) and 608(3) of the Act. However, the minimum and supervisory target capital levels set out in this Guideline provide the framework within which the Superintendent assesses whether a life insurance company maintains adequate capital pursuant to subsection 515(2) and whether a company operating in Canada on a branch basis maintains an adequate margin pursuant to subsection 608(1). Notwithstanding that a life insurance company or a company operating in Canada on a branch basis may meet these standards, the Superintendent may direct the company to increase its capital under subsection 515(3) or the branch to increase the margin of assets in Canada over liabilities in Canada under 608(4).

This guideline describes the capital required, using a risk-based formula, and defines the capital that is available to meet the minimum standard.

Foreign life insurers are reminded that MCCSR is only a component of the required assets that must be maintained in Canada by foreign insurers. Foreign life insurers must vest assets in accordance with the Adequacy of Assets in Canada test as prescribed in the *Assets (Foreign Companies) Regulations*.

Overview of Minimum Continuing Capital and Surplus Requirements for Life Insurance Companies

Overview and General Requirements

This section provides an overview of the capital adequacy requirements for life insurance companies (including societies). More detailed information on specific components of the calculation is contained under subsequent tabs.

Capital Requirements

A life insurer's minimum capital requirement is determined as the sum of the capital requirements for each of five risk components. The component capital requirements are determined using factor-based or other methods that are applied to specific on- and off-balance sheet assets or liabilities.

The five risk[1] components are:

- asset default (C-1) risk (risk of loss resulting from on-balance sheet asset default and from contingencies in respect of off-balance sheet exposure and related loss of income; and the loss of market value of equities and related reduction of income) (reference tab 3 and tab 8);
- mortality/morbidity/lapse risks (risk that assumptions about mortality, morbidity and lapse will be wrong) (reference tab 4);
- interest margin pricing risk (risk of interest margin losses with respect to investment and pricing decisions on in force business other than asset default and changes in interest rate environment) (reference tab 5); and
- changes in interest rate environment (C-3) risk (risk of loss resulting from changes in the interest rate environment other than asset default and interest margin pricing risks) (reference tab 6).
- segregated funds risk (risk of loss arising from guarantees embedded in segregated funds) (reference tab 9).

Capital requirements may be adjusted in future by the Superintendent as experience with the formula develops, as the risk profiles of life insurers change, and so that other risks such as foreign exchange risk may be formally considered.

[1] For MCCSR purposes the policy liabilities used in calculating the mortality, morbidity, lapse, interest margin pricing, changes in interest rate environment and segregated funds risks should include future income taxes under valuation assumptions as required by the Canadian Institute of Actuaries Standards, prior to any accounting adjustment for balance sheet presentation.

Capital

The definition of capital comprises two tiers, tier 1 (core capital) and tier 2 (supplementary capital), and involves certain deductions, limits and restrictions.

Foreign Companies

The margin requirement for companies operating in Canada on a branch basis covers each of the five risk components as well as foreign exchange risk, and is determined using factor-based or other methods that are applied to assets under the control of the Minister, to specific Chief Agent assets and to liabilities in Canada. The margin required is then used in calculating part of the vesting requirements for foreign insurers.

Foreign life insurers are reminded that MCCSR is only a component of the required assets that must be maintained in Canada by foreign insurers. Foreign life insurers must vest assets in accordance with the Adequacy of Assets in Canada test as prescribed in the *Assets (Foreign Companies) Regulations.*

MCCSR/TAAM Minimum and Target Capital Levels

The minimum MCCSR/TAAM ratio for life insurers is 120%. The MCCSR/TAAM ratio compares capital available to capital required as calculated by applying factors for specified risks. The ratio is set at 120% rather than 100% because the calculation does not explicitly address other risks, e.g., systems, data, strategic, management, fraud, legal and other operational and business risks, nor risks not explicitly addressed by the actuary when determining policy liabilities.

OSFI believes that each institution should establish a target capital level that provides a cushion above minimum requirements to cope with volatility in markets and economic conditions, innovations in the industry, consolidation trends and international developments. An adequate target capital level provides additional capacity to absorb unexpected losses beyond those covered by the minimum MCCSR/TAAM and to address capital needs through ongoing market access. OSFI expects each institution to establish a target total MCCSR/TAAM ratio, and maintain ongoing capital, at no less than the supervisory target of 150%. However, the Superintendent may, on a case-by-case basis, establish in consultation with an institution an alternative supervisory target ratio based upon an individual institution's risk profile. OSFI will consider any unusual conditions in the market environment when evaluating companies' performance against their target capital levels.

In addition, since tier 1 capital is the primary element of capital that allows institutions to absorb losses during ongoing operations, each institution should also establish a tier 1 target ratio that provides a significant cushion above the minimum net tier 1 ratio of 60%. OSFI expects each institution to establish a target, and maintain its ongoing net tier 1 ratio, at no less than the supervisory target of 105%. This represents 70% of the 150% total supervisory target ratio. Questions about an individual company's/branch's target capital levels should be addressed to the Relationship Manager at OSFI.

Opinion of the Appointed Actuary

The Appointed Actuary is required to sign, on the front page of the annual MCCSR-TAAM return, an opinion as to the accuracy of the return in accordance with subsection 2480 of the CIA Practice-Specific Standards for Insurers. The text of the required opinion is:

> "I have reviewed the calculation of the Minimum Continuing Capital and Surplus Requirement ratios of [Company name] as at [Date]. In my opinion, the calculation of the components of the required and available capital have been determined in accordance with the regulatory guidelines, and the components of the calculation requiring discretion were determined using methodologies and judgment appropriate to the circumstances of the company."
>
> [Note: For Test of Adequacy of Assets in Canada and Margin Requirements form filings "Minimum Continuing Capital and Surplus Requirement ratios", and "required and available capital" are replaced by "Test of adequacy of margin", and "required and available margin".]

The memorandum supporting this certification that the Appointed Actuary is required to prepare under the Standard must be available to OSFI upon request.

Authorized Official Signature

Each life insurer is required to have an authorized Officer endorse the following statement on the annual and quarterly MCCSR-TAAM returns:

> "I confirm that I have read the relevant guideline and annual return reporting instructions issued by the Office of the Superintendent of Financial Institutions and that this form is completed in accordance with them."

The Officer endorsing this statement on the annual return must be different from the insurer's Appointed Actuary.

Audit Requirement

Life insurers are required to engage the auditor appointed pursuant to section 337 or 633 of the *Insurance Companies Act* to report on the MCCSR and TAAM returns in accordance with CICA Handbook Section 5025 *Standards for Assurance Engagements*. The auditors should opine on whether the MCCSR and TAAM returns have been prepared, in all material respects, in accordance with the provisions of this Guideline. The following is an example of the audit opinion wording:

> "To Superintendent of Financial Institutions Canada
>
> "We have audited the OSFI [87/86] Return – [*Minimum Continuing Capital and Surplus Requirements for Canadian Life Insurance Companies and Fraternal Benefit Societies* / *Test of*

Adequacy of Assets in Canada and Margin Requirements for Foreign Life Insurance Companies and Fraternal Benefit Societies] (OSFI [87/86] Return) of [Life Company] as at [fiscal year end]. Management of [Life Company] is responsible for preparing the OSFI [87/86] return in accordance with the provisions of OSFI Guideline A – *Minimum Continuing Capital and Surplus Requirements for Life Insurance Companies* (MCCSR Guideline). In preparing the OSFI [87/86] return, management has made interpretations of the MCCSR Guideline as set out in note 1 attached. Our responsibility is to express an opinion on the preparation of the OSFI [87/86] return in accordance with the provisions of the Guideline and the interpretation of the Guideline as set out in note 1 attached based on our audit.

"We conducted our audit in accordance with the standards for assurance engagements established by the Canadian Institute of Chartered Accountants. Those standards require that we plan and perform an audit to obtain reasonable, but not absolute, assurance of whether the OSFI [87/86] return has been prepared in accordance with the provisions of the MCCSR Guideline in all material respects. Such an audit includes examining, on a test basis, evidence supporting the amounts in the OSFI [87/86] return.

"In our opinion, the OSFI [87/86] return of [Life Company] as at [fiscal year end] has been prepared, in all material respects, in accordance with the provisions of the Guideline and the interpretation of the MCCSR Guideline as set out in note 1 attached."

[Date, signature, auditor's name, auditor's firm if applicable]

Criteria for Qualifying Participating Policies

In light of the risk pass-through nature of participating policies, some of the risk factors applied to the components associated with participating policy liabilities and assets backing participating policies may be reduced if certain conditions are met. Risk factors may only be reduced in respect of a block of policies if experience with respect to the risk component is explicitly incorporated in the annual dividend adjustment process in a consistent manner from year to year for these policies. Specifically, participating policies and assets backing participating policies are considered *qualifying participating policies* and qualify for the reduced risk factors on the respective component only if the following four criteria are met[2]:

1. The policies must pay meaningful dividends.

2. The company's participating dividend policy must be publicly disclosed and must make it clear that policyholder dividends will be adjusted to reflect actual experience. The company must publicly disclose the elements of actual experience that are incorporated in the annual dividend adjustment process. Such elements may include investment income, asset defaults, mortality, lapses and expenses. (This requirement is effective beginning with year-end 2004).

[2] The treatment also applies if the participating policy contains adjustable factors other than dividends that meet the criteria above (i.e., they are meaningful, the criteria for their review is disclosed, they are reviewed and adjusted regularly and the company can demonstrate that it is following the policy).

3. The company must regularly (at least once a year) review the policyholder dividend scale in relation to the actual experience of the participating account. It must be able to demonstrate to OSFI, for example, which individual elements of actual experience, to the extent that they are not anticipated in the current dividend scale, have been passed through in the annual dividend adjustment. Furthermore, it must be able to demonstrate that shortfalls in actual overall experience with regard to the risk component[3] are substantially recovered within a period not exceeding five years.

4. The company must be able to demonstrate to OSFI that it follows the dividend policy and practices referred to above.

Phase-in of Changes Related to Financial Instruments Accounting Standards

For fiscal years beginning after October 1, 2006, CICA Handbook Section 3855 will mandate a new balance sheet valuation methodology for assets reported by insurance companies. Because the CALM valuation methodology for life insurance liabilities is based on the balance sheet values of assets supporting the liabilities, the value of liabilities reported will be affected as well.

In order to provide a two-year transition period to phase in the effects of changes in asset and liability valuations on the components of MCCSR available and required capital, between Q1 2007 and Q3 2008 companies should add the amount:

$$(P - N) \times \left(1 - \frac{n}{8}\right)$$

to the components for which a phase-in is applicable, where P is the component calculated at year-end 2006 under prior valuation standards, N is the component calculated at year-end 2006 under the new CICA Standard, and *n* is the number of quarters that have elapsed since year-end 2006. The following components are subject to a phase-in:

- Total MCCSR Required Capital or TAAM Required Margin,
- The negative reserve deduction from tier 1, or the negative reserve amount that is included in Assets Required, and
- For foreign companies, the total reserve amount for actuarial and other policy liabilities.

Interpretation of Results

The MCCSR formula has been designed to measure the capital adequacy of a company and is one of several indicators that OSFI uses to assess financial condition. The MCCSR should not be used in isolation for ranking and rating companies.

[3] The substantial recovery of shortfalls must be demonstrated based on actual reductions in dividend payments during the five-year period from what would have been paid during that period taking into account of all of those elements, and only those elements, that are passed through to policyholders.

Unregistered Reinsurance

The following requirements apply where a company has ceded business to unregistered reinsurers (insurance companies that are not federally regulated nor approved provincial reinsurers) under arrangements that are deemed to constitute unregistered reinsurance under Guideline B-3. These requirements supersede the requirements in the sections entitled "Capital/Margin Requirements" and "Credit for Unregistered Reinsurance" of the version of Guideline B-3 released in February 1997.

Valuation Basis for Ceded Reserves

Liabilities that are ceded by a company to an unregistered reinsurer under unregistered reinsurance must be valued, in accordance with the Canadian Asset Liability Method (CALM) of the Canadian Institute of Actuaries, using assumptions about the supporting assets that are consistent with the assets in Canada that are actually available. For the purpose of valuing ceded aggregate and policy-by-policy liabilities under this Guideline, the assets backing the ceded liability should be assumed to consist of all or a portion of:

- the assets held by the company or vested in trust under the control of the Minister that are used to support funds withheld from or other amounts due to the unregistered reinsurer;
- the assets deposited in trust by the reinsurer, net of the reduction for asset default and cash flow uncertainty risk, that are used to obtain the Credit for Unregistered Reinsurance (defined below); and
- letters of credit held to secure payment to the company by the reinsurer, net of the reduction for default risk, that are used to obtain the Credit for Unregistered Reinsurance. These amounts should be treated as non-interest bearing cash equivalents for the purpose of valuation.

If all of the above assets are not sufficient to back the ceded liability, the remaining assets backing the ceded liability should be assumed to be assets held by the ceding company or vested in trust under the control of the Minister that back the ceding company's unallocated surplus, capital, or margin.

Requirement for Aggregate Positive Reserves Ceded

For every unregistered reinsurer, a Canadian company must deduct from its total of tier 1 and tier 2 capital (reference section 2-1), and a foreign company must include in its calculation of Assets Required (reference section 7-1) the total value of the liabilities ceded to the reinsurer if positive.

Requirement for Offsetting Policy-by-Policy Negative Reserves Ceded

Where negative policy-by-policy liabilities are ceded to an unregistered reinsurer that are offset by an equal or greater amount of positive policy-by-policy liabilities ceded to the same reinsurer, the amount of ceded negative liabilities that are offset, net of any reduction of the negative reserve amount allowed for taxes under section 2-1 or 7-1, must be deducted from tier 1 capital

and included in tier 2c (for Canadian companies) or included in the calculation of Assets Required (for foreign companies).

Requirement for Aggregate Negative Reserves Ceded

Canadian Companies

Where the total value of the liabilities that a Canadian company cedes to a particular unregistered reinsurer is negative, the company must deduct from tier 1 capital and include in tier 2c the reported value of any assets appearing in the annual return (e.g. LIFE-1) that arise from the reinsurance transaction unless:

- the assets are unencumbered and held in Canada in custody of the company;
- the assets are not receivables;
- the assets do not bear any credit exposure to the unregistered reinsurer or any of its affiliates (obligations of the reinsurer or any of its affiliates that have been guaranteed by a third party must be deducted from tier 1 and included in tier 2c); and
- the assets have been transferred to the company permanently; for example, they may not become repayable in the event of the occurrence of a contingency.

The deduction from tier 1 and inclusion in tier 2 required on account of any unregistered reinsurer is limited to the value of the aggregate negative reserve ceded to the reinsurer, net of any reduction of the negative reserve amount allowed for taxes under section 2-1.

Foreign Companies

Where the total value of the liabilities that a foreign company cedes to a particular unregistered reinsurer is negative, the company must include in Assets Required the value of any assets reported as vested in trust under the control of the Minister in the annual return (e.g. LIFE-2) that arise from the reinsurance transaction unless:

- the assets do not bear any credit exposure to the unregistered reinsurer or any of its affiliates (obligations of the reinsurer or any of its affiliates that have been guaranteed by a third party must be included in Assets Required); and
- the assets have been transferred to the company permanently; for example, they may not become repayable in the event of the occurrence of a contingency.

The amount required to be added to Assets Required on account of any unregistered reinsurer is limited to the value of the aggregate negative reserve ceded to the reinsurer, net of any reduction of the negative reserve amount allowed for taxes under section 7-1.

Credit for Unregistered Reinsurance

A company is given credit for unregistered reinsurance, for each unregistered reinsurer, equal to the sum of:

- the funds held by the ceding company for the exclusive benefit of the ceding company (e.g., funds withheld reinsurance) to secure the payment to the ceding company by the reinsurer of the reinsurer's share of any loss or liability for which the reinsurer is liable under the reinsurance agreement; and

- the funds, to the extent specified in the Reinsurance Trust Agreement or Reinsurance Security Agreement, held on its behalf, minus 150% of the capital required for these funds for asset default and cash flow uncertainty risk under sections 3 and 6-3. The funds must be held in accordance with the Reinsurance Trust Agreement or Reinsurance Security Agreement, for the exclusive benefit of the ceding company, to secure the payment to the ceding company by the reinsurer of the reinsurer's share of any loss or liability for which the reinsurer is liable under the reinsurance agreement; and

- the amount of acceptable letters of credit, minus 150% of the capital required for guarantor default risk under section 3-3, held to secure the payment to the ceding company by the reinsurer of the reinsurer's share of any loss or liability for which the reinsurer is liable under the reinsurance agreement. The amount of credit supported by acceptable letters of credit is limited to 15% of the policy liabilities ceded to each unregistered reinsurer.

This credit may be applied to the following requirements:

1) The requirement for aggregate positive reserves ceded. This requirement, for any unregistered reinsurer, may be reduced to a minimum of zero using the credit for unregistered reinsurance.

2) The requirement for offsetting policy-by-policy negative reserves ceded (i.e. ceded negative reserves that are offset by an equal or greater amount of positive policy-by-policy reserves ceded to the same reinsurer). The requirement may be reduced to a minimum of zero for a particular reinsurer, but the total credit applied toward the total requirement for all reinsurers is limited to the greater of zero or:

    - The total requirement for offsetting policy-by-policy negative reserves ceded to unregistered reinsurers;

      plus

    - Net Tier 1 capital (for Canadian companies) or Available Margin less Other Admitted Assets (for foreign companies), where the amount is calculated without deducting the requirement for offsetting policy-by-policy negative

reserves ceded to unregistered reinsurers;

minus

- 50% of the company's Required Capital or Required Margin, where the required capital or margin is calculated net of registered reinsurance only.

If the maximum credit allowed is less than the total requirement, the difference must be deducted from tier 1 and added to tier 2c (for Canadian companies) or added to Assets Required (for foreign companies) and may not be covered by the credit for unregistered reinsurance. If this situation occurs, the ceding company may allocate the maximum total credit allowed to particular unregistered reinsurers in any manner it chooses.

Any credit available for a particular reinsurer that exceeds the sum of the maximums allowed under 1) and 2) above may be applied toward the capital requirements for the ceded business, subject to the conditions below.

Calculation of Required Capital/Margin

Where an unregistered reinsurer has placed deposits that exceed the amount necessary to receive the maximum allowable credit for reserves ceded to the reinsurer, the amount of the excess, divided by 1.5 or another factor if specifically required by the Superintendent, may be used to reduce certain components of required capital for the reinsured policies (those to which the excess is applied) to a minimum of zero. Companies may phase in linearly, on a quarterly basis over three years starting at year-end 2005, the factor by which the excess is divided.

The reduction for a particular reinsured policy is limited to a maximum of:

- the capital required for all of the policy's risks (excluding asset default risk) multiplied by the ceded percentage, if it is reinsured on a coinsurance basis; or
- the capital required for the policy's component risks to the extent that they are specifically reinsured, if the policy is reinsured on any other basis.

In all cases, the reductions in the specified components may not exceed the reduction that would have been available had the policy been reinsured on the same terms with a registered reinsurer.

Sections 4, 5, 6 and 9 describe the treatment of unregistered reinsurance in the MCCSR components for mortality risk, morbidity risk, lapse risk, interest margin pricing risk, changes in interest rate environment risk, and segregated fund guarantee risk, and specify additional conditions necessary to take credit for excess deposits in these particular components.

Capital

Summary of Capital Components

The three primary considerations for defining the capital of a company for purposes of measuring capital adequacy are:

- its permanence;

- its being free of mandatory fixed charges against earnings; and

- its subordinated legal position to the rights of policyholders and other creditors of the institution.

Total capital will comprise two tiers. Tier 1 ("core capital") comprises the highest quality capital elements. Tier 2 ("supplementary capital") elements fall short in meeting either of the first two capital properties listed above, but contribute to the overall strength of a company as a going concern.

If there can be some doubt as to the availability of capital (i.e., retraction privileges, uncertainty as to realizable values), it is classified as tier 2. Future income tax liabilities are not included in capital. The capital elements comprising tiers 1 and 2, as well as the various limits, restrictions and deductions to which they are subject, are described next.

Tier 1: Core Capital

Tier 1 capital elements are restricted to the following, subject to requirements established by the Superintendent:

- common shareholders' equity, defined to include common shares, contributed surplus,[4] and retained earnings;
- qualifying non-cumulative perpetual preferred shares;
- qualifying innovative tier 1 instruments (refer to appendix 2-A)
- participating account;
- non-participating account (mutual companies);
- accumulated net after-tax foreign currency translation adjustment reported in Other Comprehensive Income (OCI);
- net deferred gains/losses on real estate that have not been taken into account in the valuation of policy liabilities less, 45% on the portion of gains/losses on which no income taxes payable has been accounted for, or the future income tax amount, and
- qualifying non-controlling interests in subsidiaries arising on consolidation from tier 1 capital instruments.

[4] Where repayment is subject to the Superintendent's approval.

Deductions from Tier 1

- goodwill;
- cash surrender value deficiencies[5] calculated on an aggregate basis;
- negative reserves[5] calculated policy by policy;
- accumulated after-tax fair value gains (losses) arising from changes to the company's own credit risk under the Fair Value Option;
- accumulated net after-tax unrealized loss on available-for-sale equity securities reported in OCI;
- accumulated net after-tax unrealized loss on available-for-sale debt securities reported in OCI;
- 45% on the portion of unrealized amortized gains/losses on real estate on which no income taxes payable has been accounted for, less the future income tax amount. The expected disposition costs on unrealized gains/losses must also be deducted from capital; and
- the carrying value, net of amortization, of intangible assets that is in excess of 5% of gross tier 1 capital (reference section 2-6).

Negative reserves arising from the following two classes of business may be reduced by 30% in calculating the tier 1 deduction, in order to account for the effect of income taxes:

1) Active life reserves for Canadian individual health business, and
2) Canadian individual life business issued after 1995.

No tax reduction is allowed for negative reserves relating to any other type of business.

Net Tier 1: Tier 1 Core capital less deductions from Tier 1

Tier 2: Supplementary Capital

Tier 2 capital elements are restricted to the following, subject to requirements established by the Superintendent.

Tier 2 capital components are subject to straight-line amortization in the final five years prior to maturity or the effective dates governing holders' retraction rights (reference section 2-7).

Tier 2A: Hybrid (debt/equity) capital instruments (reference section 2-3):

Hybrid capital includes instruments that are essentially permanent in nature and that have certain characteristics of both equity and debt. Hybrid capital instruments must, at a minimum, have the following characteristics. They:

[5] For MCCSR purposes the policy liabilities used in calculating the negative reserves and csv deficiencies should include future income taxes under valuation assumptions as required by the Canadian Institute of Actuaries Standards, prior to any accounting adjustment for balance sheet presentation.

- are unsecured, subordinated to policyholder and creditor obligations and fully paid;
- are not redeemable at the initiative of the holder;
- may be redeemable by the issuer after an initial term of five years with the prior consent of the Superintendent of Financial Institutions;
- are available to participate in losses without triggering a cessation of ongoing operations or the start of insolvency proceedings; and
- allow service obligations to be deferred (as with cumulative preferred shares) where the profitability of the company would not support payment.

Tier 2A capital also includes:

- accumulated net after-tax unrealized gain on available-for-sale equity securities, and
- accumulated net after-tax unrealized gain on available-for-sale debt securities.

Tier 2B: Limited life instruments (reference section 2-4):

Limited life instruments are not permanent and include subordinated term debt and term preferred shares.

To qualify, limited life instruments must, at a minimum, have the following characteristics:

- subordination to policyholders and other senior creditors;

- an initial minimum term greater than five years; and

- may be redeemable by the issuer in the first five years, only with the prior consent of the Superintendent of Financial Institutions[6].

Limitations apply to the amount of limited life instruments that may be included in tier 2 (see page 2-1-8).

Capital instruments issued in conjunction with a repackaging arrangement that are deemed by the Superintendent to be an effective amortization are to be treated as limited life instruments subject to their conforming with the criteria for tier 2B instruments.

Tier 1 capital instruments and preferred shares qualifying as hybrid instruments in tier 2A are intended to be permanent. Where tier 1 preferred shares or hybrid instruments provide for redemption by the issuer after five years, with supervisory approval, the Office would not normally prevent such redemptions by healthy and viable companies when the instrument is or has been replaced by equal or higher quality capital including an increase in retained earnings, or if the company is downsizing. The redemption or purchase for cancellation of tier 1 instruments requires the prior approval of the Superintendent.

[6] OSFI would not normally prevent such redemptions by healthy and viable companies when the instrument is or has been replaced by equal or higher quality capital.

Debt obligations, as defined in the *Insurance Companies Act*, made by life insurers that do not qualify as capital by virtue of their characteristics are subject to a capital charge (reference section 6-2).

All capital instruments must be issued and fully paid for in money or, with the approval of the Superintendent, in property.

Tier 2C: Other capital items:

The following items qualify as tier 2C:

- 75% of cash surrender value deficiencies. For MCCSR purposes only, the cash surrender value deficiency reserve may be calculated on an aggregate basis; that is, within a particular block of business (by country and by line of business[7]) for all policies. Reserve excesses on policies with excesses are allowed to offset reserve deficiencies on policies with such deficiencies within each line (by country);

- all amounts deducted from tier 1 on account of negative reserves;

- 50% of the terminal dividend reserve associated with out-of-Canada participating life insurance business meeting the conditions set out on page 2-11.

Qualifying Non-Controlling Interests

Non-controlling interests, including subordinated debt issued to independent investors, arising on consolidation will be included in the respective categories, provided:

- the instruments meet the criteria applicable to that category; and

- they do not effectively rank equally or ahead of the claims of policyholders and other senior creditors of the insurer due to a parent guarantee or by any other contractual means.

If a subsidiary issues capital instruments for the funding of the company or that are substantially in excess of its own requirements, the terms and conditions of the issue, as well as the intercompany transfer, must ensure that investors are placed in the same position as if the instrument were issued by the company in order for it to qualify as capital on consolidation.

This can only be achieved by the subsidiary using the proceeds of the issue to purchase a similar instrument from the parent. Since subsidiaries cannot buy shares in the parent life company, it is likely that this treatment will only be applicable to the subordinated debt. In addition, to qualify as capital for the consolidated entity, the debt held by third parties cannot effectively be secured by other assets, such as cash, held by the subsidiary.

[7] As defined in the OSFI 54/55 Annual Returns

Deductions/Adjustments *(total of tier 1 and tier 2)*

The following amounts are deducted from the total of tier 1 and tier 2, after applying the tier 2B limit:

- unrealized unamortized other than temporary[8] declines in value ("impairment") of real estate investments that have not been taken into account in the valuation of policy liabilities less, 45% on the portion of gains/losses on which recoverable income taxes are not accounted for, or the future income tax amount. The amount deducted should also include expected disposition costs. This is calculated on a property-by-property basis;

- new capital issues between two or more financial institutions that represent either directly or indirectly back-to-back placements;

- investments in non-life financial corporations that are controlled by the company (reference section 2-8);

- other facilities that are treated as capital by unconsolidated subsidiaries and by unconsolidated corporations in which the company has a substantial interest (reference tab 9);

- substantial investments in corporations (reference section 2-9);

- first loss facilities as required under Guideline B-5, Asset Securitization;

- policy liabilities ceded to unregistered reinsurers less the credit for unregistered reinsurance (reference section 1-2), and

- reinsurance claims fluctuation reserves used by the assuming company to reduce its MCCSR Capital Required or TAAM Required Margin. Any reinsurance claims fluctuation reserve (CFR), experience rating refund (ERR) or similar provision that has been recorded as an asset or used to reduce liabilities in a ceding company's financial statements, and by which the assuming company reduces its MCCSR Capital Required or TAAM Required Margin must be deducted on a tax-adjusted basis from the available capital of the ceding company unless the reinsurance CFR-ERR is shared between the ceding and assuming companies. In situations where the CFR-ERR is shared, the ceding and assuming companies must agree on the capital treatment of the reinsurance CFR-ERR and the Appointed Actuaries of both companies must explain the treatment of this matter in their annual reports to OSFI.

No asset default factor will be applied to items that are deducted from capital.

[8] The expression "other than temporary" refers to situations where the market value of the real estate remains below its book value for a period of three years or more. An example of this calculation can be found in the MCCSR Interpretation Bulletin No 1.

Limitations

Common shareholders' equity (i.e., common shares and retained earnings) and policyholders' equity (mutual companies) should be the predominant form of a company's tier 1 capital.

The following limitations will apply to capital elements after the specified deductions and adjustments:

- A strongly capitalized company should not have innovative instruments and non-cumulative perpetual preferred shares that, in aggregate, exceed 25% of net tier 1 capital.
- Innovative instruments shall not, at the time of issuance, comprise more than 15% of net tier 1 capital. If at any time this limit is breached, the company must immediately notify OSFI and provide an acceptable plan showing how the insurer proposes to quickly eliminate the excess.
- The amount of capital elements, net of amortization, included in tier 2 shall not exceed 100% of net tier 1 capital.
- Limited life instruments, net of amortization, included in tier 2B shall not exceed a maximum of 50% of net tier 1 capital.

Any capital instruments and limited life instruments issued in excess of these limitations will not be counted as capital for the purpose of the risk-based capital adequacy test; however, they will be taken into account when reviewing the overall strength of the company.

Early Redemption

Redemption of a tier 1 preferred share or tier 2A hybrid instrument at the option of the issuer is not permitted within the first five years of issuance. There are however, certain circumstances under which OSFI would consider redemption during this period. These circumstances are limited to:

i) Tax laws change, adversely affecting the tax advantage of the preferred shares/hybrid instrument;
ii) OSFI's capital adequacy requirements change, such that the preferred shares/hybrid instrument could no longer be included in calculating the risk-based capital of the company on a consolidated basis; or
iii) A restructuring resulting from a major acquisition or merger where the instrument is immediately exchanged for a capital qualifying instrument of the continuing company with identical terms and conditions and capital attributes.

Superintendent approval is required for redemption at any time.

Preferred Shares (Tier 1)

Preferred shares will be judged to qualify as tier 1 instruments based on whether they are, in form and in substance:

- subordinated;
- permanent; and
- free of mandatory fixed charges.

Subordination

Preferred shares must be subordinated to policyholders and unsecured creditors of the company. If preferred shares are issued by a subsidiary or intermediate holding company for the funding of the company and are to qualify for capital at the consolidated entity (non-controlling interest), the terms and conditions of the issue, as well as the intercompany transfer, must ensure that investors are placed in the same position as if the instrument were issued by the company.

Permanence

To ensure that preferred shares are permanent in nature, the following features are *not permitted*:

- retraction by the holder;
- obligation for the issuer to redeem shares; and
- redemption within the first five years of issuance; and
- any step-up[9] representing a pre-set increase at a future date in the dividend (or distribution) rate.

Any conversion, other than to common shares of the issuer, or redemption is subject to supervisory approval and:

- redemption can only be for cash or the equivalent; and
- conversion privileges cannot be structured to effectively provide either a redemption of or return on the original investment.

For example, an issue would not be considered non-cumulative if it had a conversion feature that compensates for undeclared dividends or provides a return of capital.

It has come to OSFI's attention that preferred shares with dividends that are fixed for a period of time and then shift to a floating rate ("Fixed-Floaters") may contain embedded step-ups. OSFI must be satisfied that dividend reset features do not impair the permanence of the shares.

[9] An increase over the initial rate after taking into account any swap spread between the original reference index and the new reference index.

Permanence is impaired when there are features that create an incentive to redeem. OSFI believes a dividend reset feature that results in a step-up from the initial rate signals intent to redeem. Accordingly, OSFI's policy has been - and continues to be - that step-ups, at any level and any time, are not acceptable in a tier 1 preferred share instrument. OSFI's Guidance Note of June 2000 reaffirmed this policy and requires applicants to demonstrate that a proposed dividend reset feature does not give rise to a step-up of any amount.

Fixed-Floaters that are determined to contain a step-up will be subject to the specific treatment that is established by OSFI with the issuing FRFI.

For purposes of determining the existence of a step-up, international standards employ the "swap spread" methodology outlined in OSFI's *Interim Appendix on Innovative Tier 1 Capital)* (August 2001 or subsequent versions). In situations where the index that is the basis for the reset rate differs from that of the initial rate, this methodology uses the public swap markets to enable a comparison of the two rates. FRFIs wishing to include a dividend reset mechanism in a preferred share instrument must demonstrate, using the swap spread methodology, that no embedded step-up exists. However, for this analysis to be conclusive, a public swap market should exist between the two reference rates. Without such a market, it will be difficult for a FRFI objectively to demonstrate to OSFI's satisfaction that no step-up exists. In these circumstances, OSFI believes that only a public swap market between the two reference rates contained in the instrument provides certainty as to the intent of the dividend reset mechanism.

The only capital instruments that could qualify as tier 1 capital and contain a step-up feature are instruments that meet the requirements of rules for innovative instruments outlined in the Appendix-Innovative Tier 1 Instruments. In those limited circumstances, the instrument may have a moderate step-up only after 10 years.

Free of Mandatory Fixed Charges

Preferred shares included in tier 1 capital are *not permitted* to offer the following features:

- cumulative dividends;
- dividends influenced by the credit standing of the institution;
- compensation to preferred shareholders other than a dividend; or
- sinking or purchase funds.

In addition, the non-declaration of a dividend shall not trigger restrictions on the issuer other than the need to seek approval of the holders of the preferred shares before paying dividends on other shares or before retiring other shares. Non-declaration of a dividend would not preclude the issuer from making the preferred shares voting or, with the prior approval of the Superintendent, making payment in common shares.

To conform with accepted practice, in the event of non-declaration of a dividend, approval of the holders of preferred shares may be sought before:

- paying dividends on any shares ranking junior to the preferred shares (other than stock dividends in any shares ranking junior to the preferred shares); or
- redeeming, purchasing or otherwise retiring any share ranking junior to the preferred shares (except out of the net cash proceeds of a substantially concurrent issue of shares ranking junior to the preferred shares); or
- redeeming, purchasing or otherwise retiring less than all such preferred shares; or
- except pursuant to any purchase obligation, sinking fund, retraction privilege or mandatory redemption provisions attached to any series of preferred shares, redeeming, purchasing or otherwise retiring any shares ranking on a parity with such preferred shares.

Examples of Acceptable Features

Outlined below are examples of certain preferred share features that may be acceptable in tier 1 capital instruments:

- a simple call feature that allows the issuer to call the instrument provided the issue cannot be redeemed in the first five years and, after that, only with prior supervisory approval;
- a dividend that floats at some fixed relationship to an index or the highest of several indices as long as the index or indices are linked to general market rates and not to the financial condition of the borrower;
- a dividend rate that is fixed for a period of years and then shifts to a rate that floats over an index plus an additional amount tied to the increase in common share dividends if the index is not based on the institution's financial condition and the increase is not automatic, not a step-up, nor of an exploding rate nature; and
- conversion of preferred shares to common shares where the minimum conversion value or the way it is to be calculated is established at the date of issue. Examples of conversion prices are: a specific dollar price; a ratio of common to preferred share prices; and a value related to the common share price at time of conversion.

Examples of Unacceptable Features

Examples of preferred share features that will not be acceptable in tier 1 capital are:

- an exploding rate preferred share, where the dividend rate is fixed or floating for a period and then sharply increases to an uneconomically high level;
- an auction rate preferred share or other dividend reset mechanism in which the dividend is reset periodically based, in whole or part, on the issuer's credit rating or financial condition; and
- a dividend-reset mechanism that does not specify a cap, consistent with the institution's credit quality at the original date of issue.

Qualifying Innovative Instruments (Tier 1)

Please refer to Appendix 2-A.

Hybrid Capital Instruments (Tier 2A)

Tier 2 Capital

Tier 2 capital instruments must not contain restrictive covenants or default clauses that would allow the holder to trigger acceleration of repayment in circumstances other than the insolvency, bankruptcy or winding-up of the issuer.

Further the debt agreement must normally be subject to Canadian law. However, OSFI may waive this requirement, in whole or in part, provided the company can show that an equivalent degree of subordination can be achieved as under Canadian law. In all cases, the prior consent of OSFI must be obtained where law other than Canadian law will apply. Instruments issued prior to year-end 1994 are grandfathered. Tier 2 capital instruments with a purchase for cancellation clause will be deemed to mature on the date this clause becomes effective unless the purchase requires the prior approval of the Superintendent.

Hybrid Capital Instruments (Tier 2A)

These instruments include:

- cumulative perpetual preferred shares;
- qualifying 99-year debentures; and
- qualifying non-controlling interest arising on consolidation from tier 2 hybrid capital instruments.

To qualify as tier 2A capital, preferred shares should have characteristics similar to those required for tier 1 capital (reference section 2-2) with the exception that tier 2A preferred shares may be cumulative.

Hybrid capital instruments issued in conjunction with a repackaging arrangement that are deemed by the Superintendent to be an effective amortization are to be treated as limited life instruments subject to their conforming with the criteria for tier 2B instruments. Repackaging arrangements vary but normally involve above-market coupons and a step down in interest rates after a specified period. Economically, therefore, they may be regarded as involving disguised capital repayment. To qualify for tier 2A, capital should not have a limited life.

Perpetual[10] debentures meeting the criteria for hybrid capital instruments (reference section 2-1-3) and with the following characteristics will be eligible for tier 2A capital. They:

- are unsecured, subordinated and fully paid up;
- are not redeemable at the initiative of the holder. They may be redeemed at the initiative of the issuer after an initial term of five years with the prior consent of the Superintendent;

[10] Perpetual includes debentures with a 99-year term.

- are available to participate in losses while the issuer is still a going concern. Therefore, if the retained earnings (both par and non-par) of the issuer are negative, then the principal amount of the debt and unpaid interest must automatically convert to common or perpetual preferred shares;
- must allow the issuer to defer principal and interest payments if the issuer does not report a net profit for the most recent combined four quarters and the issuer eliminates cash dividends on its common and preferred stock. Under no circumstances will the deferral of interest be allowed to compound;
- must not contain provisions for any form of compensation in respect of any unpaid payments, except subject to prior approval of the Superintendent; and
- are free from special restrictive covenants or default clauses that would allow the holder to trigger acceleration of repayment in circumstances other than insolvency.

Limited Life Instruments (Tier 2B)

In contrast to hybrid instruments, limited life instruments are not permanent and include:

- limited life redeemable preferred shares;
- qualifying capital instruments issued in conjunction with a repackaging arrangement;
- other debentures and subordinated debt; and
- qualifying non-controlling interests arising on consolidation from tier 2 limited life instruments.

Redemption at the option of the issuer is permitted in the first five years with the prior written consent of OSFI. Such redemptions by healthy and viable institutions would not normally be prevented when the instrument is or has been replaced by equal or higher quality capital, including an increase in retained earnings, or if the institution is downsizing.

It has come to OSFI's attention that preferred shares with dividends that are fixed for a period of time and then shift to a floating rate ("Fixed-Floaters") may contain embedded step-ups. Future issues of preferred shares containing embedded step-ups at any level will be considered for inclusion only in tier 2B capital. Future issues of preferred shares or subordinated debt with embedded step-ups will be eligible for inclusion in tier 2B capital, subject to the following requirements (and subject to meeting all other requirements of tier 2B capital set out in MCCSR):

1. The step-up must be calculated using the "swap spread" methodology.
2. The step-up cannot be combined with any other feature that causes an economic incentive to redeem.
3. The terms of the instrument must not provide for more than one step-up over the life of the instrument.
4. The instrument must not have a step-up of any amount in the first five years.
5. Capital instruments with step-ups greater than 100 basis points will be treated for amortization purposes as term debt that matures at the date the step-up comes into effect.

Limited life debt instruments issued to a parent company, either directly or indirectly, will be included in tier 2B capital only with the prior approval of the Superintendent. Before granting approval, the Superintendent will consider the rationale provided by the parent for not providing equity capital or not raising tier 2B capital from external sources. The Superintendent will also want to be assured that the interest rate is reasonable and that failure to meet debt servicing obligations on the tier 2B debt provided by the parent would not, either now or in the future, be likely to result in the parent company being unable to meet its own debt servicing obligations, and would not trigger cross-default clauses under the covenants of other borrowing agreements of either the institution or the parent.

Hedging of Subordinated Debentures

When a company issues subordinated debentures and fully hedges (both in terms of duration and amount) these debentures against movements in another currency and the hedge is subordinate to the interest of the policyholders, the company should report the Canadian dollar value of the instrument, net of the accrued receivable or payable on the hedge. For limited life subordinated debentures (tier 2B), a hedge to a date less than three years before maturity will qualify as a full hedge; hedges to a call date or to a date more than three years before maturity will not.

In addition, the company should disclose information on the hedging arrangement, the amount of the translation gain/losses and the accounting treatment accorded the translation gains/losses in a note to the MCCSR/TAAM return.

Subordinated debentures denominated in a foreign currency that are not fully hedged, or where the hedge is not subordinated, should be translated into Canadian dollars at the value at the time of reporting.

Goodwill and Intangible Assets

Unamortized goodwill for acquisitions will be deducted from gross tier 1 capital. Since generally accepted accounting principles permit assets of a company being acquired to be written up to market value, OSFI will use written up values consistent with these principles in the determination of goodwill.

The deduction for intangible assets applies to assets that are acquired either individually or with a group of other assets, and as part of a business combination. Such intangibles may include, but are not limited to, trade names, customer relationships, and policy and other distribution channels.

Amortization

Tier 2 capital components are subject to straight-line amortization in the final five years prior to maturity or the effective dates governing holders' retraction rights. Hence, as redeemable preferred shares and subordinated debentures of the company or non-controlling interest preferred shares and qualifying subsidiary debt instruments approach maturity, redemption or retraction, such outstanding balances are to be amortized based on the following criteria:

Years to Maturity	Included in Capital
5 years or more	100%
4 years and less than 5 years	80%
3 years and less than 4 years	60%
2 years and less than 3 years	40%
1 year and less than 2 years	20%
Less than 1 year	0%

Similarly for capital instruments that have sinking funds, amortization of the amount paid into the sinking fund should begin five years before it is made. This is required because the amount in the sinking fund is not subordinated to the rights of policyholders.

Note:

Amortization should begin five years before the date at which the debenture or share may be redeemed at the company's option. For example, for a 20-year debenture or share that can be redeemed at the company's option any time after the first ten years, amortization should begin after the fifth year. This rule does not apply when redemption requires the Superintendent's approval.

Where there is an option for the issuer to redeem an instrument subject to the Superintendent's approval, the instrument would be subject to straight-line amortization in the final five years to maturity.

Tier 2B capital instruments with step-ups greater than 100 basis points will be treated for amortization purposes as term debt that matures at the date the step-up comes into effect.

Amortization should be computed at the end of each fiscal quarter based on the "years to maturity" schedule (above). Thus amortization would begin during the first quarter that ends within five calendar years of maturity. For example, if an instrument matures on October 31, 2000, 20% amortization of the issue would occur on November 1, 1995, and be reflected in the December 31, 1995 MCCSR return. An additional 20% amortization would be reflected in each subsequent December 31 return.

Non-life Financial Corporation Controlled by the Company

Equity investments in non-life solvency regulated financial corporations[11] that are controlled (as defined in the Act) by the company will be deducted from the sum of tier 1 and tier 2 capital. Non-life solvency regulated financial corporations include those entities that are engaged in the business of banking, trust and loan business, property and casualty insurance business, the business of co-operative credit societies or that are primarily engaged in the business of dealing in securities, including portfolio management and investment counselling.

The company will deduct these investments in controlled non-life financial corporations based on the equity method of accounting. Where the company has investments in preferred shares or debt instruments of the corporation, the amount invested in these instruments will also be deducted from capital if they qualify as capital by the regulator in that corporation's home jurisdiction. Further, where a facility such as a letter of credit or guarantee is provided by the company, is treated as capital by the non-life financial corporation controlled by the company, being available for drawdown in the event of impairment of the corporation's capital and is subordinated to the corporation's customer obligations, the full amount of the facility will also be deducted from capital. Although the facility has not been called upon, if it were drawn, the resources would not be available to cover capital requirements in the life company.

No asset default factor will be applied to equity investments, letters of credit and guarantees or other facilities provided to controlled non-life financial corporations where these have been deducted from capital. Investment in preferred shares or debt instruments of, or letters of credit provided to, controlled non-life financial corporations that are not deducted from capital will be treated like any other asset in accordance with this guideline (reference tab 3).

If a company guarantees the obligations of a controlled non-life financial corporation, an off-balance sheet capital requirement will also be imposed (reference tab 8).

[11] Where the company cannot carry on the business directly or where application of the MCCSR factors does not measure the risks adequately in the controlled non-life solvency regulated financial corporation, the deduction method should be used.

Corporation in which the Company has made a Substantial Investment

Equity investments in a corporation in which the company has made a substantial investment (as defined in section 10 of the Act) but does not control, will be deducted from the sum of tier 1 and tier 2 capital.

Portfolio investments, defined as investments of between 10% and 30% in the common shares of a corporation, that are subject to section 513 of the *Insurance Companies Act*, will be grandfathered. However, the grandfathering provision will not apply to equity investments in which the company, together with any of its subsidiaries and/or other financial institutions affiliated with the company, hold more than 30% of the common shares of another corporation.

Where a company has not been permitted to have a controlling interest in a foreign life corporation due to restrictions imposed in the foreign jurisdiction, the company will be permitted to consolidate based on its proportionate equity interest of that corporation. However, excess capital in the foreign life corporation can only be counted by the company if confirmation that the excess capital is repatriable to the parent is provided by the regulator in that jurisdiction. Further, excess capital that is counted must reflect any income tax effect upon repatriation.

The company will deduct substantial investments based on the equity method of accounting. Where the company has investments in preferred shares or debt instruments of the corporation, the amount invested in these instruments will also be deducted from capital if the instruments qualify as capital by the regulator in the home jurisdiction of the corporation. Further, where a facility such as a letter of credit or guarantee is provided by the company and is treated as capital by the corporation being available for drawdown in the event of impairment of the corporation's capital and is subordinated to the corporation's customer obligations, the full amount of the facility will be deducted from capital. Although the facility has not been called upon, if it were drawn, these resources would not be available to cover capital requirements in the life company.

No asset default factor will be applied to facilities that are deducted from capital. Investments in preferred shares, debt instruments, and facilities that are not deducted from capital will be treated like any other asset in accordance with this guideline (reference tab 3).

If a company guarantees the obligations of such corporation, an off-balance sheet capital requirement will also be imposed (reference tab 8).

Minimum Amount of Capital and Surplus

Notwithstanding the capital requirement described in the guideline, Canadian life insurance companies will be required to maintain a minimum amount of available capital, as calculated in this guideline, of $5 million or such amount as specified by the Minister.

Out-of-Canada Terminal Dividend Reserves (Tier 2C)

Fifty per cent of the terminal dividend reserve associated with out-of-Canada participating life insurance business qualifies as Tier 2C capital where:

- the terminal dividend reserve can be shown to be uniquely associated with a block of out-of-Canada (e.g., United Kingdom) lives, terminal dividends constitute a high proportion of the total benefit paid to the policyholder, and the foreign jurisdiction does not require actuarial liabilities to be set up for these dividends;
- the terminal dividend reserve is calculated in accordance with the CIA's Consolidated Standards of Practice;
- policyholder material discloses the true variability of terminal dividend payments and that the returns will vary with the returns on equity assets supporting the policies. The disclosure must indicate that the ultimate terminal dividends are tied to the financial condition of the company and the payments are at the discretion of the company; and
- the company's board of directors has passed a resolution that it will act to adjust the terminal dividends to take account of the advice of the appointed actuary and any other factors they consider relevant regarding the appropriateness of the terminal dividend scale, consistent with policyholder expectations, and the financial condition of the company.

Interim Appendix

Principles Governing Inclusion of Innovative Instruments in Tier 1 Capital

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A. Application

The principles in this Interim Appendix take effect immediately. Given the nature of the subject matter covered in this Interim Appendix, OSFI will continue to review the principles in light of any issues arising from their application to specific transactions. We plan to revisit the Interim Appendix as our experience develops. Subsequent amendments to the principles, if any, will not disqualify approvals granted under this Interim Appendix.

For the purposes of this Interim Appendix, "innovative instrument" means an instrument issued by a Special Purpose Vehicle (SPV), which is a consolidated non-operating entity whose primary purpose is to raise capital. A non-operating entity cannot have depositors or policyholders.

This Interim Appendix applies to indirect issues done through a SPV. To qualify as capital, direct issues must meet the conditions set out in the Office's Guidelines on *Minimum Continuing Capital and Surplus Requirements (MCCSR)* or *Capital Adequacy Requirements (CAR)*, as applicable. Note that step-ups are not permitted in directly issued Tier 1 instruments.

In this Interim Appendix, FRFI means:

- the operating federally regulated life insurance company that has policyholders (Life Company); or
- the operating bank or the operating federally regulated trust or loan company that has depositors (DTI) and with whom the SPV is consolidated.

In this Interim Appendix, an Asset-Based Structure is one where the assets of the SPV do not include an instrument issued by the FRFI. A Loan-Based Structure is one where the SPV's primary asset is an instrument issued by the FRFI.

B. Limits on Innovative Instruments in Tier 1 Capital

Principle #1: **OSFI expects FRFIs to meet capital requirements without undue reliance on innovative instruments.**
Common shareholders' equity (i.e., common shares, retained earnings and participating account surplus, as applicable) should be the predominant form of a FRFI's Tier 1 capital.

1(a): Innovative instruments must not, at the time of issuance, make up more than 15 per cent of a FRFI's net Tier 1 capital. Any excess cannot be included in regulatory capital.

If, at any time after issuance, a FRFI's ratio of innovative instruments to net Tier 1 capital exceeds 15 per cent, the FRFI must immediately notify OSFI. The FRFI must also provide a plan, acceptable to OSFI, showing how the FRFI proposes to eliminate the excess quickly. A FRFI will generally be permitted to include such excesses in its Tier 1 capital until such time as the excess is eliminated in accordance with its plan.

1(b): A strongly capitalized FRFI should not have innovative instruments and perpetual non-cumulative preferred shares that, in aggregate, exceed 25 per cent of its net Tier 1 capital. Tier 1-qualifying preferred shares issued in excess of this limit can be included in Tier 2 capital.

1(c): For the purposes of this principle, "net Tier 1 capital" means Tier 1 capital available after deductions for goodwill etc., as set out in OSFI's MCCSR or CAR Guideline, as applicable.

C. General Principles for Innovative Instruments

Innovative instruments may be included in Tier 1 capital (subject to the limits set out in Principle #1), provided they meet certain requirements. The following principles will govern their inclusion:

Principle #2: **The nature of inter-company instruments issued by the FRFI in connection with the raising of Tier 1 capital by way of innovative instruments must not compromise the Tier 1 qualities of the innovative instrument.**

2 (a): An SPV should not, at any time, hold assets that materially exceed the amount of the innovative instrument. For Asset-Based Structures, OSFI will consider the excess to be material if it exceeds 25 per cent of the innovative instrument(s) and, for Loan-Based Structures, the excess will be considered to be material if it exceeds 3 per cent of the innovative instrument(s). Amounts in excess of these thresholds require the Superintendent's approval.

2 (b): The following minimum standards apply to inter-company instruments issued by the FRFI when raising Tier 1 capital by way of an innovative instrument:

1) Inter-company instruments must be permanent; they may contain a maturity date provided the term to maturity is at least 30 years. If, at maturity, the proceeds are not used to repay the innovative instrument, the SPV must reinvest the proceeds in assets acquired from the FRFI.
2) Failure to make payments or to meet covenants must not cause acceleration of repayment of the inter-company instrument.
3) The inter-company instrument must not be secured or covered by a guarantee or other arrangement that legally or economically results in a priority ahead of the claims of policyholders/depositors.

2 (c): Life Companies wishing to include an Asset-Based Structure in Tier 1 capital pursuant to this Interim Appendix must satisfy OSFI that, after the assets have been transferred to the SPV, there will be sufficient cash flows available to support actuarial liabilities within the FRFI and the valuation of the FRFI's actuarial liabilities will not be materially affected.

Principle #3: Innovative instruments must allow FRFIs to absorb losses within the FRFIs on an ongoing basis.

3 (a): Innovative instruments must enable the FRFIs to absorb losses without triggering the cessation of ongoing operations or the start of insolvency proceedings. The ability to absorb losses must be present well before there is any serious deterioration in the FRFI's financial position.

3 (b): The method used to achieve loss absorption within the FRFI must be transparent and must not raise any uncertainty about the availability of capital for this purpose. Any of the following mechanisms would be acceptable, provided OSFI receives a high degree of assurance that they will function appropriately:

1) Mandatory write-down of the innovative instrument.

2) Automatic conversion into Tier 1-qualifying preferred shares of the FRFI. Automatic conversion must occur, at a minimum, upon the occurrence of any of the following events (Loss Absorption Events):

a) an application for a winding-up order in respect of the FRFI pursuant to the *Winding-up and Restructuring Act (Canada)* is filed by the Attorney General of Canada or a winding-up order in respect of the FRFI pursuant to that Act is granted by a court; or
b) the Superintendent advises the FRFI in writing that the Superintendent has taken control of the FRFI or its assets pursuant to the *Insurance Companies Act, Bank Act* or *Trust & Loan Companies Act*, as applicable; or

c) the Superintendent advises the FRFI in writing that the Superintendent is of the opinion that, in the case of a Life Company, it has a net Tier 1 capital ratio of less than 75 per cent or a MCCSR ratio of less than 120 per cent[1], or, in the case of a DTI, it has a Tier 1 capital ratio of less than 5.0 per cent or a Total Capital ratio of less than 8.0 per cent; or
d) the FRFI's Board of Directors advises the Superintendent in writing that, in the case of a Life Company, the FRFI has a net Tier 1 capital ratio of less than 75 per cent or a MCCSR ratio of less than 120 per cent, or, in the case of a DTI, the FRFI has a Tier 1 capital ratio of less than 5.0 per cent or a Total Capital ratio of less than 8.0 per cent; or
e) the Superintendent directs the FRFI, pursuant to the *Insurance Companies Act, Bank Act* or *Trust & Loan Companies Act*, as applicable, to increase its capital or provide additional liquidity and the FRFI elects to cause the exchange as a consequence of the issuance of such direction or the FRFI does not comply with such direction to the satisfaction of the Superintendent within the time specified.

If the Tier 1-qualifying preferred shares issued pursuant to an automatic conversion contain a feature allowing the holder to convert into common shares at future market values, such a feature must be structured to ensure that the investors would absorb losses. Accordingly, the right to convert must be structured to ensure that the holder cannot exercise the conversion right while a Loss Absorption Event is continuing.

The dividend rate on the Tier 1-qualifying preferred shares issued pursuant to the automatic conversion must be established at the time the innovative instrument is issued and must not exceed the market rate for such shares as at that date.

3) Another method that is consistent with Principle #4 and approved by the Superintendent.

[1] Tier 1 capital ratio is calculated as: (Tier 1 capital available after deductions for goodwill, etc. ÷ Total capital required) x 100. MCCSR Ratio is calculated as: (Total capital available ÷ Total capital required) x 100.

Principle #4: Innovative instruments must absorb losses in liquidation.

4 (a): Innovative instruments must achieve, through conversion or other means (for example, a mechanism that ensures investors will receive distributions consistent with preferred shareholders of the FRFI), a priority after the claims of policyholders/depositors, other creditors and subordinated debt holders of the FRFI in a liquidation.

4 (b): Innovative instruments must not be secured or covered by a guarantee or other arrangement that legally or economically results in a claim ranking equal to or prior to the claims of policyholders/depositors, other creditors and subordinated debt holders of the FRFI in a liquidation.

Principle #5: Innovative instruments must not contain any feature that may impair the permanence of the instrument.

5 (a): For the purposes of this principle, a step-up is defined as a pre-set increase at a future date in the dividend (or distribution) rate to be paid on an innovative instrument. Moderate step-ups in innovative instruments are permitted only if the moderate step-up occurs at least 10 years after the issue date and if it results in an increase over the initial rate not exceeding the greater of:

(i) 100 basis points, less the swap spread between the initial index basis and the stepped-up index basis; and

(ii) 50 per cent of the initial credit spread, less the swap spread between the initial index basis and the stepped-up basis.

The terms of the innovative instrument should provide for no more than one rate step-up over the life of the instrument. The swap spread should be fixed as of the pricing date and should reflect the differential in pricing on that date between the initial reference security or rate and the stepped-up reference security or rate.

5 (b): A step-up feature cannot be combined with any other feature that creates an economic incentive to redeem.

5 (c): A redemption feature after an initial five-year period is acceptable in an innovative instrument on the condition that the redemption requires both the prior approval of the Superintendent and the replacement of the innovative instrument with capital of the same or better quality, unless the Superintendent determines that the FRFI has capital that is more than adequate to cover its risks.

An innovative instrument may be redeemed during the initial five-year period, with the Superintendent's approval, upon the occurrence of tax or regulatory (including legislative) changes affecting one or more components of the transaction. It is highly unlikely that the Superintendent would approve redemption of an innovative instrument in the initial five-year period due to a tax reassessment.

The purchase for cancellation of an innovative instrument requires the prior approval of the Superintendent.

5 (d): Innovative instruments must not contain a maturity date or other feature that requires the instrument to be paid in cash. The instrument may contain the right of holders, at their option, to exchange their innovative instrument for Tier 1-qualifying preferred shares of the FRFI provided the dividend rate is established at the time the innovative instrument is issued and it does not exceed the market rate for such shares as at that date.

5 (e): An innovative instrument must not contain a feature allowing the holder to convert the innovative instrument directly into common shares of the FRFI or of other entities. Conversions into common shares are permitted only if the conversion occurs first into Tier 1-qualifying preferred shares of the FRFI which are then convertible into common shares of the FRFI or its OSFI-regulated holding company, and provided OSFI is satisfied that the innovative instrument is issued in a market where the conversion feature is widely accepted.

Principle #6: Innovative instruments must be free from mandatory fixed charges.

6 (a): The FRFI, through the SPV, must have discretion over the amount and timing of distributions. Rights to receive distributions must clearly be non-cumulative and must not provide for compensation in lieu of undeclared distributions. The FRFI must have full access to undeclared payments.

6 (b): Distributions may be paid only in cash.

6 (c): Distributions may not be reset based on the future credit standing of the FRFI.

Principle #7: Innovative instruments must be issued and fully paid-for in money, or, with the approval of the Superintendent, in property.

Principle #8: Innovative instruments, even if not issued as shares, may be included in Tier 1 capital.

Principle #9: The main features of an innovative instrument must be easily understood and publicly disclosed.

9 (a): For the purposes of this principle, OSFI will consider the main features of an innovative instrument to be easily understood where:

1) the legal (including tax) and regulatory risks arising out of the innovative instrument have been minimized to the satisfaction of the Superintendent. The likelihood of failing this test increases as the number of entities placed between the investors and the ultimate recipient of the proceeds increases, as the number of jurisdictions involved increases, and/or if the assets of the FRFI are transferred to an entity outside Canada; and

2) the manner by which the innovative instrument meets the Tier 1 capital requirements and the main features of the instrument are, in the opinion of the Superintendent, transparent to a reasonably sophisticated investor.

9 (b): The main features of innovative instruments, including those features designed to achieve Tier 1 capital status (for example, the triggers and mechanisms used to achieve loss absorption), must be publicly disclosed in the FRFI's annual report to shareholders.

D. Grandfathering

Principle #10: For purposes of Principle #1, FRFIs exceeding the "25 per cent limit" as of the date of the release of this Interim Appendix can continue to include the excess in Tier 1 capital if the excess also existed at July 30, 1999, but may only do so until July 30, 2004 unless otherwise permitted in writing by the Superintendent. Excesses created subsequent to July 30, 1999 are not grandfathered for purposes of Principle #1 unless otherwise permitted in writing by the Superintendent. All existing innovative instruments and Tier 1-qualifying preferred shares must continue to be included in the computation of a FRFI's position relative to the 15 per cent and 25 per cent limits going forward.

- END -

Asset Default (C-1) Risk

Asset Default Factors

The asset default risk includes both on- and off-balance sheet risks of life insurers. The on- and off-balance sheet risks relating to qualifying participating policies should be tracked separately from those relating to non-par policies and surplus, as the asset default factors differ (see below). In addition, assets backing index-linked products must also be separated, as these assets will attract capital factors based on correlation calculations (refer to section 3-6).

For assets backing qualifying participating policies that meet the criteria in Section 1, the asset default factors are 50% of the regular factors. Regular factors apply to assets backing non-participating products, ancillary funds, and surplus.

If the assets backing qualifying participating policies are commingled within an asset segment that also backs other products, the assets to which the reduced C-1 requirements for qualifying participating are applied must be the same assets used to back these qualifying participating policies in the calculation of the policy liabilities under the CALM methodology.

On-balance sheet

Asset Default Factors

The asset default risk for on-balance sheet items covers losses resulting from asset default and related loss of income and the loss of market value of equities and related reduction in income. For securities that have been lent, the capital requirement is outlined in section 3-5.

To compute the component requirement for the on-balance sheet asset default risk, factors are applied to the balance sheet value of the company's non-segregated assets. The resulting asset default values are added to arrive at the asset default risk component requirement. The factors to be applied to the company's non-segregated assets are as follows:

Basic Component Requirement

Factor		Basic Components
Regular	**Qualifying Participating**	
0%	0%	Cash
0%	0%	Investment income due and accrued
0%	0%	Unrealized gains and accrued receivables on forwards, swaps, purchased options and similar derivative contracts where they have been included in the off-balance sheet calculation
0%	0%	Receivables from federally regulated insurers and approved provincial reinsurers
0%	0%	Policy loans
0%	0%	Any deductions from capital, including goodwill, intangible assets and substantial investments (including facilities)

Miscellaneous Items

Factor		Miscellaneous Items
Regular	**Qualifying Participating**	
8%	4%	Book value of miscellaneous items (e.g., outstanding premiums, agent's debit balances[12], receivables, furniture and fixtures, prepaid expenses, future tax assets, intangible assets not deducted from capital)
8%	4%	Receivables from insurers that are not federally regulated or not approved provincial reinsurers
8%	4%	Instruments or investments that are not specifically identified in the guideline

Mortgage-backed securities, collateralized mortgage obligations and other asset-backed securities are dealt with under section 3-4.

[12] With respect to agent's debit balances, where there is doubt concerning the collection of interest or principal, the company must set up a provision or the "loan" must be written off. Such provisions would be based on the company's collection experience for these loans and the current economic conditions. The asset default factor would then be applied to the net amount of the agent's balances (outstanding amount less provision).

Short-term securities (original maturities of less than one year)

Factor		Short-term Securities
Regular	**Qualifying Participating**	
0%	0%	Notes and bills issued by OECD central governments and OECD central banks; notes and bills issued by Canadian provincial and territorial governments and agents of the federal, provincial and territorial governments in Canada whose debts are, by virtue of their enabling legislation, direct obligations of the parent government.
0.25%	0.125%	Bank certificates of deposit and similar obligations of Canadian deposit-taking institutions
		Commercial Paper:
0.25%	0.125%	Rated R1 (H), A-1 or equivalent
0.50%	0.25%	Rated R1 (M), A-2 or equivalent
2%	1%	Rated R1 (L), A-3 or equivalent

Bonds/Loans/Private Placements

Factor		Bonds
Regular	**Qualifying Participating**	
0%	0%	Bonds issued by OECD central governments and OECD central banks; bonds issued by Canadian provincial and territorial governments and agents of the federal, provincial and territorial governments in Canada whose debts are, by virtue of their enabling legislation, direct obligations of the parent government.
		Bonds Rated:
0.25%	0.125%	AAA, Aaa or equivalent
0.5%	0.25%	AA, Aa or equivalent
1%	0.5%	A or equivalent
2%	1%	BBB, Baa or equivalent
4%	2%	BB, Ba or equivalent
8%	4%	B or equivalent
16%	8%	Lower than B or equivalent

A company must consistently follow the latest ratings from a recognized, widely followed credit rating agency. Only where that rating agency does not rate a particular instrument, the rating of another recognized, widely followed credit rating agency may be used. However, if the Office believes that the results are inappropriate, a higher capital charge would be required.

Where a rating is not available, the factor used should be based on the company's internal rating. The company's internal ratings must be reviewed at least annually. The minimum factor that may be used is 2% (1% for qualifying participating). In the case of loans, a factor of 8% (4% for qualifying participating) should normally be used. If the Office believes that the factor used is inappropriate, a higher factor would be required.

For investments that arise as a result of asset securitization transactions, refer to Guideline B-5 *Asset Securitization* and determine if there are functions provided (i.e., credit support, enhancement or liquidity facilities) that would require a deduction of an amount from total capital or a higher C-1 asset default factor.

Note that investments in innovative tier 1 capital instruments issued by domestic or international financial institutions must be treated as equity investments based upon the underlying economic risk of the instruments.

Mortgages

The following factors should be applied to the outstanding balance before deduction of individual allowances and write-downs and excluding accrued interest. In calculating required capital, the insured balance[13] may be treated as a guarantee. The factors below remain applicable to mortgages that have been rated, and to mortgage-backed securities (rated or unrated) that do not represent a significant pooling of interests.

Factor		Mortgages
Regular	**Qualifying Participating**	
2%	1%	First mortgages on one-to-four unit residential dwellings; collateral mortgages on one-to-four unit residential dwellings, where no other party holds a senior or intervening lien on the property to which the collateral mortgage applies. If the mortgage does not meet these criteria, the factor for commercial mortgages will be applicable.
4%	2%	Commercial mortgages
8%	4%	Mortgages secured by undeveloped land (i.e., construction financing), other than land used for agricultural purposes or the production of minerals. A property recently constructed or renovated will be considered as under construction until it is completed and 80% leased.
8%	4%	That part of the mortgage that is based on an increase in value occasioned by a different future use.

[13] Only those amounts that are explicitly, unconditionally and irrevocably insured by OECD central governments, OECD central banks, or organizations with the guarantee of OECD central governments may be treated as a guarantee. This includes NHA or equivalent provincial mortgage insurance programs. Such insurance should be legally enforceable.

Equity and Mutual Fund Investments

Factor		Stocks*
Regular	**Qualifying Participating**	
		Preferred stocks:
1%	0.5%	AAA, AA, Pfd-1, P-1 or equivalent
2%	1%	A, Pfd-2, P-2 or equivalent
4%	2%	BBB, Pfd-3, P-3 or equivalent
6%	3%	BB, Pfd-4, P-4 or equivalent
15%	7.5%	B or lower, Pfd-5, P-5 or equivalent or unrated
15%	7.5%	Common stocks, income trusts, and other similar investments

* Other than investments in corporations controlled by the company or in corporations in which the company has a substantial investment.

A company must constantly follow the ratings from a recognized, widely followed credit rating agency. Only where that rating agency does not rate a particular instrument, the rating of another recognized, widely followed credit rating agency may be used.

The factor for investments in mutual funds and segregated funds is the highest factor applicable to any security that the fund holds or is permitted to invest in. However, the determination of the factor may exclude fund holdings that meet both of the following conditions:

- They are immaterial as a proportion of the fund, and
- They have higher factors than the remaining assets in the fund as the result of a change in asset quality that occurred after being acquired by the fund.

Substantial investments in any corporation will be deducted from the total capital of the company (reference 2-9).

Corporations controlled by the company

An accounting consolidation equivalent will be used for controlling investments in corporations carrying on a business that the company could carry on directly (e.g., life insurance, real estate and ancillary business subsidiaries). For those situations, the MCCSR rules will be applied to the controlled corporation. The same consolidation principle applies to subsidiaries of the company whether held directly or indirectly. The corporation's MCCSR will then be added to the parent life company's own MCCSR. The tier limitations (i.e., term tier 2 may not exceed 50% of tier 1) will be applied on a consolidated basis.

Corporations controlled by the company	Treatment
Life insurance corporation	accounting consolidation equivalent
Non-life financial corporation (reference 2-8)	deduct investment in corporation from total capital (reference section 2-8)
Commercial corporation (i.e., ancillary business corporations)	accounting consolidation equivalent
Real estate corporation	accounting consolidation equivalent

Real Estate

Factor		Real Estate
Regular	Qualifying Participating	
4%	2%	Used by the company or a consolidated subsidiary
7%	3.5%	Income producing rental properties (see below)
15%	7.5%	Other
35%[14]	17.5%	Oil and gas properties

Factors are applied to the statutory book values gross of any associated mortgage or other debt. Income-producing rental properties are limited to those residential and commercial properties that earn a yield of at least 4% of the carrying value (net of encumbrances, if any), after all real-estate expenses (including interest on encumbrances) and taxes have been charged. This would apply to properties acquired after December 31, 1991.

However, for all real-estate assets acquired prior to December 31, 1991, a company would not be required to deduct encumbrances from the carrying value of the property. Similarly, interest expenses would not be deducted from the income for calculating the 4% income test.

Income does not include amortization of the value of the property. Only cash is included. Excluded are those properties currently under development and for which imputed interest is capitalized for financial statement purposes.

[14] A 15% factor (7.5% for qualifying participating) may be used for the proved reserves of oil and gas properties that meet the following criteria:
i) there is an independent reserve engineers report certifying that there is a 90% probability that at least the estimated proved reserves will be recovered; ii) the discounted cash flows of the proved reserves (using a 90% probability of recovery) exceed the book value of the investment; and iii) the independent reserve engineers are in good standing with the profession and have a proven history in the industry.

Limited Partnerships

Investments in limited partnerships are treated as direct investments by the life company. The approach is to "look through" the partnership.

Leases

Lessee

Where a life company is the lessee under an operating lease, no capital is required. However, under a capital lease, the capital requirement for the asset held on the balance sheet is based on the underlying property leased.

Lessor

For financial leases and sales type leases, if the lease is secured only by equipment the 4% factor applies (2% for qualifying participating). If the lease is also secured by the general credit of the lessee and the lease is rated, the factor is based on the rating of the lease. If the lease is not rated, the factor is 2% (1% for qualifying participating) or a higher factor, if the company's internal rating would result in a higher capital charge.

Impaired Investments:[15]

Companies should recognize impairment in accordance with section 3025 of the CICA Handbook. As a minimum, if any of the following criteria apply, an investment must be classified as impaired:

- there is reasonable doubt about the timely collection of the full amount of principal or interest;
- an individual allowance has been established; — Not resulting from a concession granted to restructure the investment
- a write-off has been taken; — Not resulting from a concession granted to restructure the investment
- the amount outstanding has been placed into a loan realization account;
- a payment on personal plan loans, residential mortgages or non-personal loans is contractually 90 days in arrears unless senior credit management determines that there is no reasonable doubt about the ultimate collectibility of principal or interest (in these circumstances, the determination of no reasonable doubt about ultimate collectibility would require that the loan is both "well secured" and in the "process of collection"); or
- a payment is contractually 180 days in arrears.

[15] If a payment is contractually 90 days in arrears for deposits with other deposit-taking financial institutions, it is considered impaired and is subject to the additional 35% factor (17.5% for qualifying participating).

Investments identified as impaired require an additional component requirement as follows:

- [35% (17.5% for qualifying participating) x (outstanding balance[16] - insured balance)] less amounts of individual allowances and write-downs. The component should not be negative.

  (Note: accrued interest is excluded in determining the additional requirement since it must be reversed in accordance with the Superintendent's accounting specification.)

For bonds and private placements, the requirements become the sum of:

2% (1% for qualifying participating) x (outstanding balance less individual allowances and write-downs)[17]; and

[35% (17.5% for qualifying participating) x outstanding balance[16]] less the amount of individual allowances and write-downs.
The component should not be negative.

The calculation is based on the separate portfolio of impaired loans, mortgages, bonds and private placements, not on individual investments or mortgages by mortgages.

Restructured loans and mortgages:

The basic component and impaired factors above are replaced by 15% (7.5% for qualifying participating) for restructured loans and mortgages. A loan or mortgage is considered to have been restructured when the lender, for economic or legal reasons related to the borrower's financial difficulties, grants a concession to the borrower that it would not otherwise consider.

The 15% factor (7.5% for qualifying participating) will continue to be applied to restructured loans and mortgages until cash flows have been collected for a period of at least one year in accordance with the amended terms and conditions.

The 15% factor (7.5% for qualifying participating) will also be applied to a loan or mortgage, at the time of renewal or during the life of the loan or mortgage, when the following conditions exist:

i) the company is aware that the borrower is in financial difficulty; and

ii) the loan to value ratio is higher than 75%.

It should be noted that a loan or mortgage should be classified as impaired, when the lender no longer has reasonable assurance of timely collection of the full amount of principal and interest.

[16] The outstanding balance represents the principal balance of the loan before write-downs and individual allowances.

[17] The outstanding balance represents the principal balance of the loan before write-downs and individual allowances.

A contractual payment on a restructured loan or mortgage that is 90 days in arrears indicates that the lender no longer has reasonable assurance of timely collection of the full amount of principal and interest.

Collateral

Assets collateralized by cash (bank certificates of deposit) or by securities issued by OECD central governments, OECD central banks, OECD public sector entities (PSEs) or multilateral development banks where the company does business, may be assigned the factor applicable to the collateral, as follows:

Factor		Collateral
Regular	**Qualifying Participating**	
0%	0%	Securities issued by OECD central governments and OECD central banks; securities issued by Canadian provincial and territorial governments and agents of the federal, provincial and territorial governments in Canada whose debts are, by virtue of their enabling legislation, direct obligations of the parent government.
0.25%	0.125%	Cash[18] (bank certificates of deposit and similar obligations of Canadian deposit-taking institutions with original maturities of less than one year).
1.6%	0.8%	Multilateral development bank securities (reference section 8-4); securities issued by Canadian municipalities and PSEs directly and wholly owned by a Canadian government (reference section 3-3) and non-domestic OECD PSEs (reference section 3-3).
2%	1%	Canadian PSEs in which a government may have an ownership interest but that do not meet the 0% or 1.6% factor criteria (reference section 3-3) and Canadian PSEs that meet the 1.6% factor criteria but where the assignment of a 1.6% factor would, in the opinion of the parent government, seriously disadvantage private sector competition (reference section 3-3); PSEs in non-OECD countries (reference section 3-3).

In addition, loans for which insurance policies are provided as collateral will receive a 0% factor if the following conditions are met.

- Both the loan and the policy provided as collateral are issued by and remain held by the company
- The term of the loan does not exceed the term of the policy provided as collateral
- The company has the legal right and intention of offset in the event the loan goes into default or the policy is cancelled
- Amounts owing under the loan, including any unpaid interest, are never greater than the proceeds available under the collateral
- The aggregate amount outstanding under the loan agreement, including accrued interest, does not at any time exceed the cash surrender value of the policy

[18] Gold held as collateral may be considered the equivalent to cash where the claim is made in gold.

If any of these conditions are not met, an asset default factor of 8% (4% for qualifying participating) should be applied to the loan.

No other forms of collateral may reduce the factor applicable to a particular asset. If the value of the collateral covers less than the book value of the asset, only the part of that asset that is fully covered may receive the appropriate lower factor. Generally for off-balance sheet instruments, collateral should be applied to the notional principal amount. However, in the case of forwards, swaps, purchased options and similar derivative contracts that are marked-to-market, the collateral is applied against the replacement cost (where positive) plus add-ons.

Cash collateral is restricted to bank certificates of deposit and similar obligations of Canadian deposit-taking institutions held for the account of the borrower on express terms such that:

- the cash may not be withdrawn for the duration or remaining duration of the exposure; and
- it is assigned to the insurance company which may apply the cash to discharge the exposure if and to the extent that it is not discharged by the borrower/customer in accordance with the terms of the loan etc. agreement with the borrower/customer and there are no legal impediments to prevent the collateral from being used to discharge the exposure.

The collateral must be marked-to-market regularly and should be held throughout the period for which the asset was outstanding.

For syndicated loans, where an agent institution holds the cash collateral on behalf of the syndicate, the collateral must be notionally allocated to parallel the syndication of the loan. However, only the agent institution may reduce the factor applicable to its collateralized portion of the loan to the risk weight of the collateral. Provided that there is an explicit agreement that the agent institution is holding the collateral on behalf of the lending syndicate and that the participating institutions have a charge over their share of the collateral, the agent institution will be considered the counterparty for the collateralized portions of loan held by the other participating institutions and they may reduce the factor applicable on that portion of the loan accordingly.

Guarantees

Assets (principal and interest) that have been explicitly, irrevocably and unconditionally guaranteed by OECD central governments, organizations with the guarantee of OECD central governments, OECD central banks, OECD public-sector entities (see below), multilateral development banks, OECD incorporated banks, OECD incorporated securities firms subject to comparable supervisory and regulatory arrangements, Canadian life insurers and Canadian deposit-taking institutions and their branches (reference section 8-5) may receive a lower asset default factor where the effect is to reduce the risk; such guarantees should cover the full term of the instrument and be legally enforceable. A standby letter of credit serving as a financial guarantee that meets these conditions (i.e., it is explicit, irrevocable and unconditional) can be used in lieu of a guarantee. Where an asset is partially guaranteed, the lower factor applicable will only be applied to that part of the asset that is fully guaranteed.

A guarantee by a parent or an unconsolidated affiliate of a claim on a third party will not reduce the factor applied to the assets of the company. This treatment follows the principle that guarantees within a corporate group are not a substitute for capital.

The factors to be applied are as follows:

Factor		Guarantees
Regular	**Qualifying Participating**	
0%	0%	OECD central governments; organizations with the guarantee of OECD central governments (e.g., Export Development Corporation); OECD central banks.
1.6%	0.8%	Multilateral development banks (reference section 8-4); OECD incorporated banks, OECD securities firms subject to comparable supervisory and regulatory arrangements, Canadian life insurers and Canadian deposit-taking institutions and their branches (ref. section 8-5).

Guarantees by Public Sector Entities (PSEs)

Canada

The following is the set of criteria for factors to be applied to the guarantees by PSEs in Canada. If the asset default factor of the guarantee is less than that of the original obligation, the factor of the guarantee may be used to reduce that portion of the original obligation covered by the guarantee. The factors for guarantees are:

Factor		Guarantees by PSEs
Regular	**Qualifying Participating**	
0%	0%	All provincial and territorial governments; agents of the federal, provincial or territorial governments whose debts are, by virtue of their enabling legislation, direct obligations of the parent government.
1.6%	0.8%	Entities directly and wholly owned by a government; school boards, hospitals, universities and social service programs that receive regular government financial support, and municipalities.
2%	1%	Entities in which a government may have an ownership interest but that do not meet the 0% or 1.6% factor criteria; entities that meet the 1.6% factor criteria but where the assignment of a 1.6% factor would, in the opinion of the parent government, seriously disadvantage private sector competition (see below).

Public Sector Entities in Competition

The following list is based on information supplied by the provinces and the federal government. It identifies PSEs that are, in the judgement of the host government, significantly in competition with the private sector to the extent that being applied a factor lower than 2% (1% for qualifying participating) would seriously disadvantage private sector competitors. Therefore, guarantees provided by PSEs in this list are to be assigned a factor of 2% (1% for qualifying participating) unless companies verify that the debt obligations have been fully, unconditionally and explicitly guaranteed in accordance with section 3-3.

Some of the entities noted below have received either a specific guarantee of certain debt obligations or an explicit, full and unconditional guarantee (agent status) of all debt obligations. Upon verification of those guarantees, companies will be permitted to reduce the factor applicable to their exposure to that of the guarantor.

PSEs in Competition (list effective February 1991)

British Columbia

1. British Columbia Food Exhibitions Ltd.
2. Insurance Corporation of British Columbia

Alberta

1. Gainers
   - Kretschmar Inc.
2. NovAtel Communications Ltd.
   - Carcom Inc.
3. Northern Steel Inc.

Saskatchewan

1. Saskatchewan Government Insurance
2. Saskatchewan Economic Development Corporation

Manitoba

1. A.E. MacKenzie Co. Limited
   - Subsidiaries of A.E. MacKenzie Co. Limited
2. Channel Area Loggers Ltd.
3. Manitoba Mineral Resources Ltd.
4. Venture Manitoba Tours Ltd.
5. Moose Lake Loggers Ltd.

Ontario

1. Ontario Northland Transportation Commission
   - Nipissing Central Railway Company
   - 75887 Ontario Limited
2. Ontario Energy Corporation
3. Ontario Development Corporation

Québec

1. Société de récupération d'exploitation et de développement forestier du Québec (REXFOR)
    - Les produits forestiers Bellerive - Ka'N'Enda Inc.
    - Gestion 1195 Inc.
    - Énerbois Inc.
    - Proforêt Inc.
        - Produits forestiers St-Alphonse Inc.
        - Scierie Grand-Remous
2. Société générale de financement du Québec (SGF)
    - Albecour, société en commandite
    - Dofor Inc.
    - Éthylec
    - Le Groupe Mil Inc.
3. Société nationale de l'amiante (SNA)
    - Mines SNA Inc.
    - Asbestos Corp. Ltd
    - Les mines d'amiante Bell Ltée
    - Magmaq Inc.
    - Atlas Turner Inc.
    - Atlas International Building Products Inc.
    - Ceram-SNA Inc.
    - Fusoroc Inc.
    - Turner Building Products Ltd.
    - 151222 Canada Inc.
4. Sidbec
    - Normines Inc.
    - Sidbec Dosco Inc.
    - Sidbec Feruni Inc.
    - Sidbec International Inc.
5. Société québécoise d'exploration minière (SOQUEM)
    - Soquemines Inc.
6. Société québécoise d'initiatives pétrolières (SOQUIP)
    - Exploration SOQUIP Inc.
    - SOQUIP Atlantique Inc.
    - SOQUIP Alberta Inc.
7. Société de radio-télédiffusion du Québec (Radio-Québec)

New Brunswick

1. Algonquin Properties Ltd.
2. Fredericton Hotel Company Ltd.
3. New Brunswick Coal Ltd. (Subsidiary of NB Electric Power Commission)

Nova Scotia

1. Subsidiaries of Sydney Steel Corporation
2. Subsidiaries of Nova Scotia Resource Limited

Newfoundland

1. Marystown Shipyard Limited
2. Newfoundland Hardwoods Limited
3. Newfoundland Farm Products Corporation

Prince Edward Island

1. Georgetown Shipyard Ltd.
2. Prince Edward Island Development Agency
3. Prince Edward Island Grain Elevators
4. Prince Edward Island Agricultural Development Corporation (previously listed as PEI Land Dev. Corp.)

Federal Government

1. Nordion International (subsidiary of Canada Development Investment Corporation)
2. Theratronics (subsidiary of Canada Development Investment Corporation)
3. Canadian National
4. Petro-Canada
5. Via Rail Canada Inc.

Other OECD Countries

Guarantees by public sector entities wholly and directly owned by central governments of other OECD countries will be applied a factor of 1.6% (0.8% for qualifying participating) or, if in competition with the private sector, 2% (1% for qualifying participating).

Non-OECD Countries

PSEs in these countries will be applied a factor of 2% (1% for qualifying participating).

Asset Backed Securities

Asset backed securities include collateralized mortgage obligations and mortgage backed securities.

NHA Mortgage-Backed Securities

NHA mortgage-backed securities that are guaranteed by the Canada Mortgage and Housing Corporation shall carry a factor of 0% to recognize the fact that obligations incurred by CMHC are legal obligations of the Government of Canada.

Rated Asset Backed Securities

Refer to Annex 1 of Guideline B-5 for the credit risk factors that are applicable to asset backed securities that have been rated by a recognized, widely followed credit rating service.

Unrated Asset Backed Securities

The asset default factor is 8% (4% for qualifying participating) for unrated asset backed securities unless they are of the pass-through type and effectively a direct holding of the underlying assets, and the following conditions are met:

- the underlying asset pool may contain only assets that are fully performing when the asset-backed security is created;
- the securities must absorb their pro rata share of any losses incurred;
- a special-purpose vehicle should be established for securitization and administration of the pooled assets;
- the underlying assets are assigned to an independent third party for the benefit of the investors in the securities who will then own the underlying assets;
- the arrangements for the special-purpose vehicle and trustee must provide that these obligations are observed:
    - if an administrator or a servicer is employed to carry out administration functions, the vehicle and trustee must monitor the performance of the administrator or servicer;
    - the vehicle and/or trustee must provide detailed and regular information on structure and performance of the pooled assets;
    - the vehicle and trustee must be legally separate from the originator of the pooled assets; and
- the vehicle and trustee must be responsible for any damage or loss to investors created by their own or their servicer's mismanagement of the pooled assets;

- the trustee must have a first priority charge on underlying assets on behalf of the holders of the securities;
- the agreement must provide for the trustee to take clearly specified steps in cases when an asset goes into default;
- the holder of the security must have a pro rata share in the underlying assets or the vehicle that issues the security must have only liabilities related to the issuing of the asset-backed security;
- the cash flows of the underlying assets must meet the cash flow requirements of the security without undue reliance on any reinvestment income; and
- the vehicle or trustee may invest cash flows pending distribution to investors only in short-term money market instruments (without any material reinvestment risk) or in new assets that meet the terms and conditions of the security.

Where the investor bears less than pro rata share of credit risk, the C-1 factor is the highest factor associated with the underlying assets.

Where the underlying pool contains assets that have become impaired, that portion of the instrument requires an additional factor calculated in accordance with the treatment accorded to impaired investments as set out in section 3-1 of the MCCSR guideline.

Securities Lending

In securities lending, companies can act as principal to the transaction by lending their own securities or as agent by lending securities on behalf of clients.

When the company lends its own securities, the risk factor is the higher of:

- the factor related to the instrument lent; or
- 2% (1% for qualifying participating). This factor could be reduced if the lender held eligible collateral (reference section 3-2). Where the company lends securities through an agent and receives an explicit guarantee of the return of the securities, the company can reduce the factor as outlined in the guarantee section of the guideline (see section 3-3).

When the company, acting as agent, lends securities on behalf of a client and guarantees that the securities lent will be returned or the company will reimburse the client for the current market value, the capital requirement for this off-balance sheet risk is calculated in section 8-9. The risk could be reduced if the company held eligible collateral (reference section 3-2).

Index-Linked Products

These products have the following characteristics.

- Both assets and liabilities for these contracts are held in the general fund of the life insurance company.

- The policyholder is promised a certain return in the contract, based on an index. The following are examples of such returns:

    1. The same return as a specified public index. This includes, but is not limited to a public stock index, a bond index, an index maintained by a financial institution, etc.
    2. The same return as is earned by one of the company's segregated funds.
    3. The same return as is earned by one of the company's mutual funds.
    4. The same return as is earned by another company's mutual funds.

- The company may invest in assets that are not the same as those that constitute the indices.

The current C-1 asset default factors do not apply to assets backing index-linked products. All assets backing index-linked products must be segmented and included in the index-linked reporting form, and will attract capital factors based on correlation calculations (see below).

The following conditions must be adhered to.

- All assets backing index-linked products must be segmented into asset subgroups

- A separate asset subgroup must be maintained for each index referred to in the policies

- The returns (on a market basis) of each asset subgroup must be tracked

- Any transfers into or out of the asset subgroup must be at market

To determine the capital factor applicable to a particular subgroup of assets, a correlation factor (CF) must be calculated.

$$CF = A*(B/C)$$

where: A represents the historical correlation between the returns credited to the policyholder funds and the returns on the subgroup's assets

B represents the minimum of [standard deviation of asset returns, standard deviation of returns credited to policyholder funds]

C represents the maximum of [standard deviation of asset returns, standard deviation of returns credited to policyholder funds]

Note: the CF must be calculated for each asset subgroup.

The historical correlations and standard deviations must be calculated on a weekly basis, covering the previous 52-week period. The returns on the asset subgroups must be measured by the increase in their market value net of policyholder cash flows.

The MCCSR required capital factor is equal to 100% minus CF.

The CF for the previous 12 months, and the corresponding MCCSR required capital factor, are to be calculated each quarter.

The MCCSR required capital factor used at a quarter-end is equal to the highest required capital factor of the last four quarters' calculations.

The MCCSR capital requirement at a quarter-end is equal to the required capital factor applied to the market value at the quarter-end of the assets in the asset subgroup.

Instead of the use of policyholder funds in the calculations, a company could use cash surrender values or policy liabilities to measure the correlation. The basis used must be consistently applied in all periods.

For assets backing index-linked products that are not segmented into asset subgroups, or for which the CF cannot be calculated, the MCCSR required capital factor is 15% (i.e. CF = 85%).

Newly formed funds will have a 15% MCCSR required capital factor (i.e. CF = 85%) for the first three quarters. Combined with the requirement to use the highest capital factor of the last four quarters' calculations, this entails that the MCCSR required capital factor will be 15% (i.e. CF = 85%) for the first 18 months of newly formed funds.

When a synthetic index investment strategy is used, there is some C-1 risk that is not directly borne by the policyholder. For instance, this can be comprised of the C-1 requirements of the fixed income securities associated with the synthetic index strategies and the related counterparty

risks on the derivatives. These required C-1 amounts must also be held, in addition to the index-linked requirements of this section.

For those index-linked insurance policies that have a minimum death benefit guarantee, the appropriate MCCSR factor for segregated fund mortality guarantees should be applied. These factors may be obtained using the GetCost function as described in section 9-6. The required amounts may be reduced by reinsurance credits and by any policyholder liabilities covering this risk.

Assets Replicated Synthetically

Where a company has entered into off-balance sheet transactions that have the practical effect of transforming on-balance sheet assets into assets in a higher risk category, or that otherwise increase the company's exposure to C-1 risk, it must hold capital for the additional risks assumed. These exposures should be reported in the sections covering C-1 risk of the OSFI-86/87 return as if the assets whose risk is assumed under the transactions were actually held on the balance sheet. Examples of such transactions include exposures to equities undertaken through bond-equity swaps or purchased futures contracts, and exposures to credit risk assumed through the sale of credit derivatives. The C-1 factor for an asset exposure undertaken through a derivative contract would normally be applied to the notional amount of the contract rather than its mark-to-market value.

No additional capital is required for:

- Hedges of index-linked liabilities that have been taken into account in the correlation factor calculation, or
- Hedges of segregated fund guarantee risk undertaken as part of an OSFI-approved hedging program, or other hedges of segregated fund guarantee risk that have been designated for this purpose and that clearly mitigate the risk.

The above requirements are distinct from the requirements for counterparty credit risk arising from off-balance sheet transactions. Transactions referenced in this section remain subject to the charges for potential replacement cost as described in Section 8.

Mortality, Morbidity and Lapse Risk

Mortality Risk

New Methodology and Phase-in

The methodology described below is taken from the February 2005 CIA Research Paper "Mortality Requirements in MCCSR, TAAM and CAR" with only slight modifications.

The new methodology will be phased in starting at year-end 2005 and will be fully implemented by Q3 2008. During the phase-in period, the total requirement at each quarter-end will be the requirement calculated under the new methodology at the quarter-end multiplied by:

$$\alpha + (1-\alpha)\frac{n}{12}$$

where α is the ratio of the requirement calculated under the prior methodology to the requirement calculated under the new methodology at year-end 2005, and *n* is the number of quarters that have elapsed since the end of Q3 2005.

Insurance (including Accidental Death and Dismemberment)

The gross mortality component for life insurance (both individual and group) is the sum of the components for volatility risk and catastrophe risk. The gross requirement is reduced by credits for policyholder deposits, unregistered reinsurer deposits and stop-loss arrangements to arrive at the net requirement.

In order to compute the mortality requirement, a company must partition its book of business into sets of like products. Basic death and AD&D products may not be included in the same set, nor may individual and group products. All products within a set should have similar attributes with respect to adjustability and mortality guarantee duration.

All cashflow projections, benefit amounts and reserve amounts used to determine the mortality component should be calculated net of all reinsurance that is not deemed to be unregistered reinsurance under Guideline B-3. Cashflow projections should take into account all current valuation decrements and assumptions including margins for adverse deviation.

The net amount at risk for a policy or set of products, for both directly written business and business acquired through reinsurance, refers to the total net face amount of all of the included policies minus the total net reserve for the included policies, where both the face amount and the reserve are net of registered reinsurance.

For purposes of the mortality component, basic death benefits include supplementary term coverages, participating coverages arising out of dividends (paid-up additions and term additions), and increasing death benefits associated with universal life policies (i.e. policies where the death benefit is the face amount plus funds invested). More generally, any mortality risk supported by the general account should be included in the MCCSR calculation.

Reduced factors for adjustable and participating business may only be used for adjustable policies where mortality adjustability is reasonably flexible, and for qualifying participating policies that meet the criteria in Section 1. For adjustable, participating or universal life policies where mortality adjustability is not reasonably flexible, the factors for "all other" business should be used. The reasonable flexibility of the adjustability features should have been tested in pricing the policy or elsewhere, and should demonstrate that the company may recuperate at least half of any unexpected losses due to volatility or catastrophe risk. This would be done by comparing the price with and without future adjustments, using the regular or reduced component as appropriate. The tests performed should be available upon request.

Volatility Component

The capital required for volatility risk is:

$$\sqrt{\sum_{\text{Basic Death}} S^2} + \sqrt{\sum_{\text{AD\&D}} S^2}$$

where the sums are taken over all sets of basic death and AD&D products respectively, and *S* is the volatility component for the set of products. The formula for *S* is given by:

$$S = 2.5 \times A \times B \times E/F$$

where:

- *A* is the standard deviation of the upcoming year's projected net death claims for the set, defined by:

$$A = \sqrt{\sum q(1-q)b^2}$$

In the above equation, the sum is taken over all policies in the set (or over all certificates in the set if the set consists of group policies), *q* is equal to the valuation mortality (including the margin for adverse deviations) for a particular policy, and *b* is the net death benefit for the policy. The standard deviation of projected claims should be based on claims at the policy level, rather than claims per life insured. Multiple policies on the same life may be treated as separate policies, but distinct coverages of the same life under a single policy should be aggregated. If this aggregation is not done due to systems limitations, the impact should still be measured and accounted for in the total requirement.

- *B* is defined by:

$$B = \begin{cases} \max\left(\frac{1}{2}\ln(D), 1\right) & \text{for sets of adjustable and participating policies that meet the criteria for reduced factors} \\ \max\left(\ln(D), 1\right) & \text{for all other sets of policies} \end{cases}$$

where D is equal to the Macaulay duration of all projected net death claims for the policies in the set, calculated assuming a discount rate of 5% per year, and ln is the natural logarithm function.

- E is the total net amount at risk for the policies in the set, and
- F is the total net face amount for the policies in the set.

When there is insufficient data available to calculate A and B for a set of group basic death products, the following approximations may be used:

$$A \approx \frac{39 \times C}{\sqrt{N}}$$

$$B \approx \begin{cases} 1 & \text{for adjustable and participating products that meet the criteria for reduced factors, and for products having a mortality guarantee duration of 2 years or less} \\ 2 & \text{for all other products} \end{cases}$$

where C is the projected value of the upcoming year's total net death claims for all policies in the set (including claims projected to occur after policy renewal dates), and N is the total number of lives covered under the policies in the set. The above approximations may not be used for sets of individual products.

When there is insufficient data available to calculate A and B for a set of AD&D products, the volatility component S for the set may be approximated as:

$$0.3 \times \sqrt{\sum_{\substack{\text{Comparable} \\ \text{Basic Death}}} S^2} \times E/G$$

where:

- The sum is taken over a collection of sets of comparable basic death products, and S is the volatility component for the set.
- E is the total net amount at risk of the set of AD&D products whose volatility component is being estimated; and
- G is the total of the net amounts at risk of the sets of basic death products.

If the above approximation is employed, the sets of basic death products used should be reasonably comparable to the set of AD&D policies with respect to duration, extent of reinsurance, etc. It may not be appropriate to simply use the entire book of individual or group basic death products.

For group AD&D products, if no comparable sets of basic death products can be used, the approximation for group basic death products may be used with the approximation for *A* changed to:

$$A \approx \frac{78 \times C}{\sqrt{N}}$$

Where an insurer does not have sufficient data available to calculate *A* and *B* for a set of individual basic death products, and the set is not material relative to the insurer's entire book of business, the Appointed Actuary may approximate these values using any formula or technique that has been recommended specifically for immaterial blocks of individual life products by the CIA's Committee on Risk Management and Capital Requirements or by one of its subcommittees.

Catastrophe Component

The capital required for catastrophe risk is:

$$\sum_{\text{All Products}} K$$

where the book of business is partitioned into the same sets as in the volatility component, and *K* is the capital requirement for catastrophe risk for the set. The formula for *K* is given by:

$$K = \alpha \times C \times E/F$$

where:

- $\alpha = \begin{cases} 0.05 & \text{for sets of adjustable and participating policies that meet the criteria for reduced factors} \\ 0.1 & \text{for all other sets of products} \end{cases}$
- *C* is the projected value of the upcoming year's total net death claims for all policies in the set (including claims projected to occur after policy renewal dates),
- *E* is the total net amount at risk for the policies in the set, and
- *F* is the total net face amount for the policies in the set.

For purposes of the catastrophe component, group policies with no rate guarantee beyond the current year are considered adjustable.

When there is insufficient data available to calculate *C* for a set of AD&D products, the catastrophe risk requirement *K* for the set may be approximated as:

$$0.15 \times \sum_{\substack{\text{Comparable} \\ \text{Basic Death}}} K \times E/G$$

where:

- The sum is taken over a collection of sets of comparable basic death products, and *K* is the catastrophe risk requirement for the set.
- *E* is the total net amount at risk of the set of AD&D products whose catastrophe risk requirement is being estimated; and
- *G* is the total of the net amounts at risk of the sets of basic death products.

If the above approximation is employed, the sets of basic death products used should be reasonably comparable to the set of AD&D policies with respect to duration, extent of reinsurance, etc. It may not be appropriate to simply use the entire book of individual or group basic death products.

Adjustments for Group Business

For sets of group business, any death benefit amount (*b*) included in the calculation of *A* or projected death claim included in the calculation of *C* may be multiplied by a scaling factor if it is associated with a policy or benefit that has one of the following features:

1) "guaranteed no risk",
2) deficit repayment by policyholders, or
3) a "hold harmless" agreement where the policyholder has a legally enforceable debt to the insurer.

The scaling factor to be used is 0.05 if the group policyholder is the Canadian Government or a provincial or territorial government in Canada, and 0.15 for all other policyholders.

"Administrative Services Only" group contracts where the insurer bears no risk and has no liability for claims should be excluded from the calculation of the mortality component.

Deposits in excess of liabilities, excluding the liability for such deposits, may be used to reduce the mortality component. Such deposits must be:

1) made by policyholders,

2) available for claims payment (e.g., claims fluctuation and premium stabilization reserves, and accrued provision for experience refunds), and

3) returnable, net of applications, to policyholders on policy termination.

The amount by which the component may be reduced for a deposit made under a particular contract is limited to a maximum of:

$$\left(V - \left(\sqrt{\sum_{\substack{\text{Individual} \\ \text{Basic Death}}} S^2} + \sqrt{\sum_{\substack{\text{Individual} \\ \text{AD\&D}}} S^2} \right) + \sum_{\text{Group}} K \right) \times E/G$$

where:

- V is the gross component for volatility risk;
- S is the volatility component for the set of individual products being summed;
- K is the catastrophe risk requirement for the set of group products being summed;
- E is the annualised premium for the group contract; and
- G is the total of annualised premiums for all group business.

Claims fluctuation reserves or other deposits made as part of a reinsurance agreement to reduce the assuming company's risk, divided by 1.5 or another factor if specifically required by the Superintendent, may be used to reduce the mortality component in the same manner and subject to the same limit as policyholder deposits. The credit is applicable only to the reinsured group policies for which the deposit is made.

Credit for Reinsurance

All intermediate quantities used to determine the mortality component should be calculated net of all reinsurance that is not deemed to be unregistered reinsurance under Guideline B-3. Such reinsurance may include modco agreements, provided that the assuming company fully takes the agreement into account in its own mortality risk calculation.

For sets of products containing contracts where the direct or assumed premiums are guaranteed but the reinsurance premiums are adjustable, both the volatility component and the catastrophe risk requirement for the set should be calculated twice: once net of the reinsurance as if it were not adjustable, and once gross of the reinsurance. The volatility component and the catastrophe risk requirement used in the mortality risk calculation are then the averages of those found from the two calculations.

Deposits under the control of the company for a period not less than the mortality charge guarantee term remaining that are in excess of the reserves for the risk reinsured and that are made by reinsurers not subject to these requirements may be used to reduce the mortality

component. For Canadian business, the deposit must be held in Canada, and the company's relevant regulatory authority must have given the ceding company permission to reduce its reserves by the amount of the deposit corresponding to the reserves. The amount by which the component may be reduced on account of a deposit made by a particular unregistered reinsurer is limited to a maximum of:

$$(M_1 - M_2) \times E/G$$

where:

- M_1 is the gross mortality component calculated net of registered reinsurance only.
- M_2 is the gross mortality component calculated net of all reinsurance.
- E is the weighted net amount at risk ceded to the reinsurer under all agreements deemed to be unregistered reinsurance. For individual UL policies, individual adjustable-premium policies for which the mortality adjustability is reasonably flexible, and individual qualifying participating policies that meet the criteria in Section 1, a weight of 50% should be applied to the ceded net amounts at risk. For all other policies, the weight used should be 25% if the mortality guarantee term remaining is one year or less, 50% if the guarantee term is greater than one year but less than or equal to five years, and 100% otherwise.
- G is the total weighted net amount at risk ceded to all reinsurers under agreements deemed to be unregistered reinsurance.

Credit for Stop Loss Arrangements

Should a legally binding agreement exist whereby a company or branch substantially assumes all the claim costs for a block of policies in excess of a predetermined amount, the ceding company may reduce its mortality requirement subject to the prior approval of the Superintendent. To obtain such approval, the ceding company must justify the amount of the reduction it is seeking in terms of the reduction in risk achieved by the arrangement based on the results of the company's own modeling. The modeled results must include measurements of the stop-loss arrangement's effect on both loss volatility and catastrophic losses.

Where OSFI has granted credit for a stop-loss arrangement and the assuming company or branch is licensed to do business in Canada, the ceding company must retain in its records the assuming company's actuary's certification that the assuming company (i) is legally bound to pay all claims in excess of the predetermined amount, and (ii) has included the amount claimed by the ceding company in its own MCCSR mortality requirement calculation. Where the stop-loss arrangement is deemed to be unregistered reinsurance under Guideline B-3, credit may be taken by the ceding company only to the extent that deposits placed by the assuming company in excess of ceded reserves are available to cover the ceded mortality requirement.

Catastrophe covers are ineligible for stop-loss credit.

Disability and other Morbidity Risks

For policies classified as life insurance, calculate the component requirement as outlined for accident and sickness policies' treatment of morbidity risk.

Annuities Involving Life Contingencies

The risks associated with vested annuity mortality, financial, or asset risks are dominated by overall systematic risks (e.g., inadequate premium rates). Since risks of random statistical fluctuation are not material, no adjustment is necessary for differences in size.

The component requirement is 1% of the total policy liabilities, including any portion of the policy liability that does not involve life contingencies.

Morbidity Risk

Morbidity risk for accident and sickness insurance relates to risks arising from volatility in claims experience, and from events that would lead to increased claims. To compute the morbidity component, a factor is applied to the measure of exposure to risk. The resulting values are added to arrive at the morbidity risk component requirement.

The factors used in deriving the risk component vary with the guaranteed term remaining in the exposure measure. The measure of exposure to risk is as follows:

Risk	Measure of Exposure	Applicable Guaranteed Term
Disability Income, New Claims Risk	Annual earned premiums	length of the premium guarantee remaining
Disability Income, Continuing Claims Risk	Disability income reserves relating to claims of prior years	length of the benefit period remaining

Disability Income Insurance and Waiver of Premium Benefits

The additional risks associated with non-cancellable guaranteed premium business should be recognized. As well, increased volatility is characteristic of disability income insurance, as compared to medical and dental expense reimbursement business.

New Claims Risk

The new claims risk component relates to claims arising from the current year's coverage, and includes the risks of incidence and claims continuance. The factor applied to the measure of exposure is as follows:

Percentage of Annual Earned Premiums[19]		Length of Premium Guarantee Remaining
Individually Underwritten	Other	
12%	12%	less than or equal to 1 year
20%	25%	greater than 1 year, but less than or equal to 5 years
30%	40%	greater than 5 years

[19] For travel insurance, the capital charge should be applied to revenue premiums.

For benefits attached to group life insurance policies, the factors for individual coverages should be used.

These factors should be multiplied by 75% for benefit periods that do not exceed two years.

Continuing Claim Risk

The continuing claims component covers the risk of claims continuance arising from coverage provided in prior years. The factor applies to disability income or waiver of premium claim reserves related to claims incurred in prior years, including the portion of the provision for incurred but unreported claims.

The factor applied to the measure of exposure is as follows:

Duration of Disability			Length of Benefit Period Remaining
less than or equal to 2 years	**greater than 2 years but less than or equal to 5 years**	**greater than 5 years**	
4.0%	3.0%	2.0%	**less than or equal to 1 year**
6.0%	4.5%	3.0%	**greater than 1 year but less than or equal to 2 years**
8.0%	6.0%	4.0%	**greater than 2 years or lifetime**

Accidental Death and Dismemberment

These benefits should be included in the company-wide calculation of the mortality risk component, as outlined in the Insurance (including Accidental Death and Dismemberment) section. However, for automobile and common carrier accidental death and dismemberment coverages, only "all cause" policies solicited by mail should be included in the mortality risk component. Specific accident perils accidental death and dismemberment policies solicited by mail, and "free" coverages on premium credit card groups should be included in "Other Accident and Sickness Benefits".

Other Accident and Sickness Benefits

<u>New Claims Risk</u>

The component requirement is 12% of annual earned premiums. This approximates 15% of net annual premiums.

Continuing Claims Risk

The component requirement is 10% of the provision for incurred but unpaid claims relating to prior years. The use of prior years avoids a double component requirement for incurred but unpaid claims arising from coverage purchases by premiums paid in the current year.

Credit for Reinsurance and Special Policyholder Arrangements

Premium and reserve amounts used in calculating the requirement for morbidity risk should be determined net of all reinsurance that is not deemed to be unregistered reinsurance under Guideline B-3. For reinsurance arrangements that are deemed to constitute unregistered reinsurance, excess deposits placed by the reinsurer may be used to reduce the component requirement as described in Section 1-2.

The requirement for any group benefit may be multiplied by a scaling factor if it carries one of the following features:

1) "guaranteed no risk",
2) deficit repayment by policyholders, or
3) a "hold harmless" agreement where the policyholder has a legally enforceable debt to the insurer.

The scaling factor to be used is 0.05 if the group policyholder is the Canadian Government or a provincial or territorial government in Canada, and 0.15 for all other policyholders.

No component is required for "Administrative Services Only" group contracts where the insurer bears no risk and has no liability for claims.

Deposits in excess of liabilities, excluding the liability for such deposits, may reduce the component requirement for any group policy to a minimum of zero. Such deposits must be:

1) made by policyholders,
2) available for claims payment (e.g. claims fluctuation and premium stabilization reserves, and accrued provision for experience refunds), and
3) returnable, net of applications, to policyholders on policy termination.

Claims fluctuation reserves or other deposits made as part of a reinsurance agreement to reduce the assuming company's risk, divided by 1.5 or another factor if specifically required by the Superintendent, may be used to reduce the component requirement to a minimum of zero. The credit should be applied before the adjustment for statistical fluctuation, and is applicable only to the reinsured policies for which the deposit is made. (Companies may phase in linearly, on a quarterly basis over two years starting at year-end 2005, the factor by which deposit amounts are divided).

Adjustment for Statistical Fluctuation

The total capital and surplus requirements for morbidity risk is multiplied by a factor determined by interpolation from the following table:

Factor	Calculated Component Requirement
1.00	less than or equal to $ 10,000,000
0.95	$ 20,000,000
0.85	$ 50,000,000
0.75	greater than or equal to $ 100,000,000

The applicable factor may be determined using the aggregate of the calculated component requirement and the corresponding component requirements for life insurance subsidiaries where consolidation is appropriate.

The factor used by a subsidiary to adjust for statistical fluctuation may be the same as that of its parent if there exists a legally binding agreement between the two under which the parent fully guarantees all of the subsidiary's liabilities.

The factor used by a branch operation of a non-resident company to adjust for statistical fluctuation may only take account of its Canadian business.

Lapse Risk

The lapse risk component of required capital recognizes the risk that lapse experience may vary year to year from what has been assumed. The component is required for any individually priced policy or certificate that is subject to lapse risk and for which a lapse assumption is used in valuing the liabilities; this includes all individual life, individual health and funeral business, as well as each certificate under group policies for which premiums or reserves are based on individual insured characteristics. It is calculated by either increasing or decreasing the lapse assumption for each policy at each duration, depending on which adjustment produces a higher reserve. For policies having crossover points, the assumed lapse rate will be increased at some durations and decreased at others.

The lapse component is determined by:

1) Calculating total policy liabilities net of registered reinsurance only. This calculation may not take into account any cession, on any particular policy, that is deemed to be unregistered reinsurance under Guideline B-3.

2) Recalculating total net policyholder liabilities (taking into account only those reinsurance cessions included in the reserve in Step 1) using higher lapse margins for adverse deviation. The magnitude of the lapse margin at each policy duration should be increased by 7.5 percentage points for qualifying participating policies meeting the criteria in Section 1 and adjustable premium policies, and 15 percentage points for all other policies.

   For example, if a lower lapse assumption at a particular duration for a non-participating, non-adjustable premium policy produces a higher reserve, and the valuation assumption uses a best-estimate lapse rate of 6% reduced by a 10% margin to 5.4%, then the revised assumption should use a lapse rate of 6% reduced by a 25% margin to 4.5%. On the other hand, if a higher lapse assumption at a particular duration produces a higher reserve, and the valuation assumption uses a best-estimate lapse rate of 6% increased by a 10% margin to 6.6%, then the revised assumption should use a lapse rate of 6% increased by a 25% margin to 7.5%.

   All other assumptions remain unchanged from those used in Step 1.

3) Subtracting the reserve calculated in Step 1 from the reserve calculated in Step 2.

The 7.5% factor for adjustable business may only be used for adjustable policies where adjustability to recover losses from lapse experience is reasonably flexible. For adjustable, participating or universal life policies where lapse adjustability is not reasonably flexible, the 15% factor for "all other" business should be used. The reasonable flexibility of the adjustability features should have been tested in pricing the policy or elsewhere, and should demonstrate that the company may recuperate at least half of any unexpected losses due to lapse risk. This would be done by comparing the price with and without future adjustments, using the regular or reduced component as appropriate. The tests performed should be available upon request.

Although it is preferable to calculate the lapse risk component based on year-end reserves, companies may calculate the component based on a quarter end selected during the year. In this case, the increase in reserves from step 1) to step 2) is expressed as a percentage and is used for all MCCSR/TAAM calculations for the following 12 months.

In order to simplify the calculation of this component, companies are not expected to modify systems that make automatic mortality adjustments when lapse assumptions change.

Interest Margin Pricing Risk

Policy Liabilities

Interest margin pricing risk for life, and accident and sickness insurance is the part of the risk associated with inadequate pricing. Capital is necessary to protect against interest margin losses arising from future investment and pricing decisions on in force business.

Losses in interest can be occasioned by such events as communication problems between investment and pricing personnel, by the lack of sufficient volumes of new bond and mortgage investment opportunities, and by changes in the interest spread relationships between different investments. Any losses occasioned by past investment and pricing decisions must be reflected in the policy reserves. Losses arising from asset default (C-1) and changes in the interest rate environment (C-3) are accorded separate treatment in the development of required capital; as such, they are specifically excluded from this risk component.

To compute the interest margin pricing component, a factor is applied to the appropriate measure of exposure to risk. The resulting values are summed to arrive at the interest margin pricing component.

The measure of exposure to risk for the interest margin pricing component is the policy liabilities. Companies may take credit (reduce reserves) for business ceded to reinsurers that are federally regulated, approved provincial reinsurers, or where the reinsurance is not deemed to be unregistered reinsurance under the Unregistered Reinsurance Guideline B-3. The factors used in deriving the risk component are as follows:

Factor	Type of Business
0.005	All qualifying participating policies that meet the criteria in Section 1; and all non-participating policies with adjustable premiums, or adjustable interest credits (i.e., a repricing risk exists)
0.010	Other business[20]

The reduced factor for adjustable business may only be used for adjustable policies where the adjustability for lower than anticipated interest income is reasonably flexible. For adjustable, participating or universal life policies where this adjustability is not reasonably flexible, the factor for "other business" should be used. The reasonable flexibility of the adjustability features should have been tested in pricing the policy or elsewhere, and should demonstrate that the company may recuperate at least half of any unexpected losses due to interest margin pricing risk. This would be done by comparing the price with and without future adjustments, using the regular or reduced component as appropriate. The tests performed should be available upon request.

[20] Other business includes guaranteed premium non-par business.

No component is required for GIC - type deferred annuities where the contract offers renewal only at the rate for new business. Other situations require the 0.005 factor.

No component is required for business where there is no repricing risk; such as paid-up business not receiving policyholder dividends, experience refunds, or excess interest credits. This includes business purchased in form of annual single premiums, and disabled life reserves.

No component is required for business where the policy liabilities are not discounted for interest, such as unearned premiums.

Changes in Interest Rate Environment (C-3) Risk

Policy Liabilities

Changes in interest rate environment (C-3) risk is the risk associated with asset depreciation arising from interest rate shifts. Capital is necessary to cover the dependence of asset and liability cash flows on interest rate fluctuation.

The component for changes in interest rate environment risk specifically encompasses the risk occasioned by rising interest rates. Disintermediation may diminish cash flows, hamper investments at the higher rates, or prompt the liquidation of assets at depressed prices. Losses arising from asset default (C-1), and interest margin pricing risks are accorded separate treatment in the development of required capital; and as such, are specifically excluded from this risk component.

To compute the changes in interest rate environment component, a factor is applied to the appropriate measure of exposure to risk. The resulting values are summed to arrive at the changes in interest rate environment component.

The measure of exposure to changes in interest rate environment risk is the policy liabilities. Companies may take credit (reduce reserves) for business ceded to reinsurers that are federally regulated, approved provincial reinsurers, or where the reinsurance is not deemed to be unregistered reinsurance under the Unregistered Reinsurance Guideline B-3. The factors used in deriving the risk component are as follows:

Factor	Guaranteed Period Remaining on Premium Rates or Credited Interest	Product
0.01	less than 5 years	Life and Health Insurance, other than Universal Life
0.02	greater than or equal to 5 years, but less than 10 years	
0.03	greater than or equal to 10 years	
0.015	less than 5 years	Endowment Insurance, other than Universal Life
0.03	greater than or equal to 5 years, but less than 10 years	
0.05	greater than or equal to 10 years	
0.01	Single Premium Immediate Annuities (including RRIFs) and Disability Claims Payable in Instalments (including Disability Waiver)	

For the measure of exposure used in this calculation, policy liabilities should be net of policy loans where the policy loan rate is variable, and not subject to an upper limit; or where there is direct recognition of policy loans by policy in the dividend scale, or the crediting of excess interest. Policy loan interest rates based on an index would be considered variable.

The tabled factors are halved for insurance policies without guaranteed cash surrender values (including maturity values) in the next five years.

For qualifying participating policies that meet the criteria in Section 1, and for universal life policies that grant interest on a portfolio rate basis (where rates change freely), the appropriate factors in the preceding table for a guarantee period of less than five years should be used (notwithstanding the reference to "other than universal life"). A reduced factor may only be used for universal life policies where the credited rates are reasonably flexible. The reasonable flexibility of the crediting features should have been tested in pricing the policy or elsewhere, and should demonstrate that the company may recuperate at least half of any unexpected losses due to disintermediation risk. This would be done by comparing the price with and without future adjustments, using the regular or reduced component as appropriate. The tests performed should be available upon request.

Assets backing index-linked products identified in section 3-6 are exempt from the C-3 risk requirements.

For current premium rates that are significantly less than the maximum guaranteed premium rates, the guarantee term is that applicable to the current rates.

No component is required for business where the policy liabilities are not discounted for interest, and on which there is no interest credited.

Accumulation Funds

Separate treatment is accorded accumulation funds (including all amounts on deposit), deferred annuities, retirement income policies, and universal life products. The factors used in deriving the risk component vary with the guaranteed term remaining in the exposure measure, as well as with the plan type. The different plan types are defined as follows:

Type A At all times, funds may be withdrawn only

(i) with an adjustment to reflect changes in interest rates or asset values since fund receipt; or

(ii) by way of an immediate life annuity; or

(iii) in instalments over a minimum of five years; or

(iv) for amounts not greater than the annual interest credits allowed.

Type B Fund withdrawal is defined as for Type A, except that funds may be withdrawn at the end of the interest guarantee period in a single sum, or in instalments over less than five years.

Type C Funds may be withdrawn before the end of the guarantee period in a single sum, or in instalments over less than five years, either

- without adjustment to reflect changes in interest rates or asset values since fund receipt; or

- subject only to a fixed surrender charge, either in amount or as a percentage of the funds.

The factors used in deriving the risk component for accumulation funds (including all amounts on deposit), deferred annuities, retirement income policies, and universal life products are as follows:

Factor	Type of Plan
0.005	** daily interest accounts being credited with market short-term interest, and with interest rate guarantee periods remaining of six months or less
0.010	guaranteed period remaining less than 10 years (other than in **) for Plan Types A and B
0.020	guaranteed period remaining greater than or equal to 10 years for Plan Types A and B
0.020	guaranteed period remaining greater than 6 months but less than 18 months for Plan Type C
0.050	guaranteed period remaining greater than 18 months but less than 10 years for Plan Type C
0.100	guaranteed period remaining greater than or equal to 10 years for Plan Type C

For accumulation funds, the guarantee period is the number of years remaining until the next interest rate reset date. Accumulation funds include claim fluctuation reserves, stabilization reserves, and provisions for experience rating refunds.

For group plans, for purposes of distinguishing between Plan Types, fund withdrawal does not include employee withdrawals upon termination of employment, retirement, disability, or death. Withdrawals occasioned by adverse aggregate group experience, such as claim fluctuation reserves, are also excluded.

Single premium funeral insurance may be classified as a Type A or Type B accumulation fund for purposes of the C-3 risk component calculation, with the duration (guaranteed period remaining) set equal to the average expected remaining life of the portfolio, so that the applicable factor is either 0.010 or 0.020. However, funeral insurance with periodic premiums must be classified as a regular insurance product. In order to receive a preferential factor, a funeral insurance product must have all of the following characteristics:

- The insurance policy provides a relatively small cash death benefit to cover the cost of a funeral;
- Most or all of the death benefit is assigned to a funeral home to provide specific funeral goods and services pre-arranged between the policyholder and the funeral home;
- The average age at issue is relatively advanced (e.g. 60 or older); and
- The proceeds of the policy are payable directly to a funeral home.

Debt obligations

Debt obligations, as defined in the Insurance Companies Act, contracted by life insurers that do not qualify as capital by virtue of these characteristics will receive a factor of 1%. The Insurance Companies Act prescribes that "debt obligation" means a bond, debenture, note or other evidence of indebtedness of an entity, whether secured or unsecured.

Asset Cash Flow Uncertainty Risk

The asset cash flow uncertainty risk component covers against losses caused by the prepayment and extension of investments that are sensitive to interest rate fluctuations.

C-3 component is not required for:

- traditional fixed income investments including non-callable, callable and extendible bonds;
- residential mortgages and commercial mortgages with prepayment penalties or prepayment conditions;
- commercial mortgage backed securities supported by pools of commercial mortgages with prepayment penalties or prepayment conditions;
- Canadian pass-through MBSs and Canadian CMOs supported by pools of NHA insured mortgages with prepayment penalties or prepayment conditions;
- assets backed by a pool of automobile and light truck loans, credit card receivables and trade receivables;
- asset backed securities with floating rate coupons; and
- franchise loans with treasury make whole clauses.
- assets backing index-linked products identified in section 3-6

A C-3 factor of 1% applies to:

- residential mortgages and commercial mortgages that have no prepayment penalties or conditions;
- Canadian CMOs supported by a pool of mortgages that have no prepayment penalties or clauses; and
- pass-through asset backed securities collateralized by home improvement loans and manufactured housing loans.

U.S. Pass-through MBSs and CMOs

OSFI has adapted the Flow Uncertainty Index (FLUX) that was developed for the National Association of Insurance Commissioners as a measure of the relative cash flow variability of CMO bands.

FLUX scores of U.S. MBSs and CMOs determine the C-3 factor that applies to these investments:

FLUX Score	C-3 Factor
≥0 & <5	0.5%
≥5 & <10	1%
≥19 & <12	2%
≥12 & <14	4%
≥14 & <16	6%
≥16 & <18	8%
≥18 & <20	10%
≥20 & <30	15%
≥30 & <40	30%
≥40 & <50	50%
≥50	75%

Other Fixed Income Assets

If the appointed actuary has conducted tests on a fixed income investment not covered above under an appropriate range of interest rate scenarios, has completed and documented the work, and has concluded that:

- the investment has a degree of cash flow uncertainty risk no greater than that of a U.S. CMO with a FLUX score of less than 5, or no more than two times greater than that of a non callable bond with the same maturity, C-3 factor is **0.5%** for the investment;
- the degree of cash flow uncertainty is equivalent to that of a U.S. CMO with a FLUX score of between 5 and 10, or five times that of a non-callable bond of the same maturity, the C-3 factor is **1%**;
- the degree of cash flow uncertainty is greater than that of a U.S. CMO with a FLUX score of 10, the C-3 factor is **8%.**

The 8% factor also applies to untested investments as well as to leveraged derivatives and leveraged structured notes.

C-3 factors for cash flow uncertainty may be reduced by 50% for assets backing cash flow tested reserves.

Companies Operating in Canada on a Branch Basis

Companies Operating in Canada on a Branch Basis

Under Section 608 of the *Insurance Companies Act*, foreign life insurers are required to maintain an adequate margin of assets in Canada over liabilities in Canada. The test of Adequacy of Assets in Canada and Margin Requirements (TAAM) set out in this guideline provides the framework within which the Superintendent assesses whether companies operating in Canada on a branch basis maintain an adequate margin pursuant to subsection 608(1).

Companies operating in Canada on a branch basis are required to maintain assets in Canada, in respect of their life insurance business in Canada, that are sufficient to cover:

1) reserves for actuarial and other policy liabilities;
2) unpaid claims;
3) other liabilities and amounts related to the carrying on of its life insurance business in Canada; and
4) a margin of assets in Canada over liabilities in Canada.

These requirements are prescribed in accordance with the *Assets (Foreign Companies) Regulations*.

Test of Adequacy Ratio

The test of adequacy ratio measures the adequacy of assets available to meet the margin requirements as determined in accordance with this Guideline. The ratio is defined as Available Margin divided by Required Margin. Available Margin is the difference between Assets Required and Assets Available. The determination of Assets Required, Assets Available, and Required Margin is described below.

Assets Required

Assets Required consists of:

- reserves for actuarial and other policy liabilities[21];
- provisions for policyholder dividends and experience rating refunds;
- outstanding claims and adjustment expenses;
- policyholder amounts on deposit;
- accounts payable;
- income taxes payable;
- mortgage loans and other real estate encumbrances;
- net deferred gains or losses on disposal of portfolio investments;

[21] For TAAM purposes, policy liabilities should include future income taxes under valuation assumptions as required by the Canadian Institute of Actuaries Standards, prior to any accounting adjustment for balance sheet presentation.

- future income tax liabilities;
- other Canadian liabilities;
- policy liabilities ceded to unregistered reinsurers (see section 1-2);
- negative reserves calculated policy by policy;
- cash surrender value deficiencies calculated on an aggregate basis;
- equity investments in corporations in which the branch has a substantial investment but does not control (tab 2-9);
- first loss facilities or transfer of assets with recourse (in accordance with the *Asset Securitization Guideline B-5*); and
- reinsurance claims fluctuation reserves used by the assuming company to reduce its MCCSR Capital Required or TAAM Required Margin. Any reinsurance claims fluctuation reserve (CFR), experience rating refund (ERR) or similar provision that has been used to reduce the liabilities reported by a Branch or otherwise reduce its TAAM Assets Required, and by which the assuming company reduces its MCCSR Capital Required capital or TAAM Required Margin must be included on a tax-adjusted basis in Assets Required of the ceding Branch unless the reinsurance CFR-ERR is shared between the ceding and assuming companies. In situations where the CFR-ERR is shared, the ceding and assuming companies must agree on the capital treatment of the reinsurance CFR-ERR and the Appointed Actuaries of both companies must explain the treatment of this matter in their annual reports to OSFI.

less:

- loans secured by policies in Canada;
- agents' debit balances and outstanding premiums;
- the credit for unregistered reinsurance (see section 1-2); and
- amounts due from federally regulated insurers and approved reinsurers that can be legally netted against the actuarial liabilities of the Branch.

Negative reserves arising from the following two classes of business may be reduced by 30% in calculating the amount included Assets Required, in order to account for the effect of income taxes:

1) Active life reserves for Canadian individual health business, and
2) Canadian individual life business issued after 1995.

No tax reduction is allowed for negative reserves relating to any other type of business.

In order to deduct an amount due from a federally regulated insurer or approved reinsurer from Assets Required, a Branch must satisfy OSFI that, at a minimum, the following conditions have been met:

- The amount due is from an insurer to which the Branch has a liability of an equal or greater amount. (Amounts due in excess of the liability may not be deducted from Assets

Required; they may only be included in *Other Admitted Assets*, below).

- The Branch has a netting contract or agreement with the insurer to which the liability is owed that creates a single legal obligation. The result of such an arrangement must be that the Branch would have only one obligation for payment or one claim to receive funds based on the net sum of the liabilities and amounts due in the event of default, bankruptcy, liquidation or similar circumstances of the Branch or the counterparty to the agreement.
- The netting arrangement provides that only the liabilities of the Branch to the counterparty may be taken into consideration in determining the net amount owed. In particular, the counterparty must not be able to net amounts due to the Branch against any liabilities of the parent company or affiliates of the Branch that are not liabilities of the Branch itself.
- The Branch must have written and reasoned legal opinions that in the event of any legal challenge, the relevant courts and authorities would find the amount owed to be the net amount under: a) the law of the jurisdiction where the counterparty is incorporated, and the laws of any jurisdiction applicable to the branches involved; b) the law governing the individual insurance transaction; and c) the law governing any contracts or agreements required to effect the netting arrangement.
- The Branch must have procedures in place to ensure that a regular review of the legal characteristics of the netting arrangement for possible changes in law is undertaken to maintain the validity of the contract.

Assets Available

Assets Available consists of :

- admitted assets vested in trust under the control of the Minister;
- investment income due and accrued on admitted vested assets;
- net deferred gains or losses on disposal of portfolio investments that were not taken into account in the valuation of policy liabilities; and
- *Other Admitted Assets*, as specified below.

For the purpose of calculating the test of adequacy ratio, vested assets are to be valued in accordance with the *Assets (Foreign Companies) Regulations*.

Required Margin

The Required Margin is equal to the sum of the risk components described under tabs 3, 4, 5, 6, 8 and 9, plus the component for foreign exchange risk, and applies to:

- assets under the control of the Minister;
- liabilities in Canada; and

- the book value of assets under the control of the Chief Agent, if these are taken into consideration in determining *Other Admitted Assets* below.

The component for foreign exchange risk must be calculated separately for each foreign currency, and is equal to 8% of the net unmatched position (i.e. the absolute difference between assets and liabilities in that currency) converted to Canadian dollars at the current exchange rate.

Other Admitted Assets

In calculating Assets Available, a branch may include the lesser of:

A) 50% of the Required Margin; or

B) the sum of:

i) the total book value of the following assets under the control of the chief agent, all of which must be unencumbered:

- automobiles, furniture and equipment, computer hardware, leasehold improvements; and
- amounts due from federally regulated insurers and approved reinsurers not in arrears;

ii) the lesser of:

a) all amounts included in Assets Required on account of negative reserves; and
b) the *Negative Reserve Limit*, as defined below

and;

iii) 75% of the cash surrender value deficiencies calculated on an aggregate basis.

Assets under the control of the Chief Agent will be considered only if the following conditions are met:

- records and record keeping facilities in Canada are satisfactory to the Superintendent,
- the branch has received an unqualified auditor's opinion, and
- the Superintendent receives an undertaking from the head office of the company and the Chief Agent specifying that the assets under section B)(i) under the control of the Chief Agent will be maintained in Canada.

Negative Reserve Limit

The limit that is applied to the amount of negative reserves that can be included in Other Admitted Assets is a percentage of the excess of assets over liabilities, where assets and liabilities are determined as follows:

Assets

Total assets under control of the Minister (excluding segregated funds) valued in accordance with the *Assets (Foreign Companies) Regulations.*

Less: - Equity investments in corporations in which a substantial investment has been placed under the control of the Minister[22,23].

- The capital requirement (calculated according to this Guideline) of a corporation in which a controlling interest has been placed under the control of the Minister[24].

Liabilities

Total liabilities (excluding segregated fund liabilities)

Less: - Policy loans

- Agents' debit balances and outstanding premiums

- Amounts due from federally regulated insurers and approved reinsurers that can be legally netted against the actuarial liabilities of the Branch.

[22] Substantial investments in corporations will be deducted based on the equity method of accounting. No asset default factor will be applied to investments in corporations that are deducted from the available margin.

[23] If it appears that the risks associated with these investments are greater than the amount invested, the Superintendent might impose an additional requirement.

Off-Balance Sheet Activities

Off-Balance Sheet Activities

The term "off-balance sheet activities", as used in this guideline, encompasses guarantees, commitments, derivatives, and similar contractual arrangements whose full notional principal amount may not necessarily be reflected on the balance sheet. Such instruments are subject to a capital charge under this section irrespective of whether they have been recorded on the balance sheet at market value.

The major risk to life insurance companies associated with off-balance sheet activities is the default of the counterparty to a transaction, i.e., credit risk. The face amount of an off-balance sheet instrument does not always reflect the amount of the credit risk. To approximate the potential credit exposure, the face amount of the instrument must be multiplied by a credit conversion factor to derive a credit equivalent amount (reference section 8-2). The resulting credit equivalent amount is then assigned a factor appropriate to the counterparty (reference section 8-3) or, if relevant, a factor assigned to the collateral security (reference section 3-2) or to the guarantor (reference section 3-3).

Some off-balance sheet transactions involving guarantees or credit derivatives fall outside the scope of this section. Guarantee transactions should be classified and treated as follows:

- A transaction under which a company receives credit protection is subject to the treatment accorded guarantees in section 3-3.
- A transaction under which a company provides credit protection on a rated debt instrument should be treated as a synthetic asset under section 3-7.
- A transaction under which a company provides credit protection on any other obligation should be treated as a direct credit substitute under this section.

Companies should also refer to the Asset Securitization Guideline (B-5). The guideline outlines the regulatory framework for asset securitization transactions and for other types of asset transfers with recourse. The purpose of the guideline is to ensure that financial institutions maintain adequate capital to protect themselves against risks arising as a result of these transactions and to insulate themselves to the extent possible from any moral recourse obligations.

Credit Conversion Factors

The face amount (notional principal amount) of off-balance sheet instruments does not always reflect the amount of credit risk in the instrument. To approximate the potential credit exposure of non-derivative instruments, the notional amount is multiplied by the appropriate credit conversion factor to derive a credit equivalent amount. The process for determining the credit equivalent amounts of derivative instruments is covered in section 8-6. The resulting credit equivalent amount is then treated in a manner similar to an on-balance sheet instrument and is assigned the risk factor appropriate to the counterparty or, if relevant, the guarantor or collateral. The categories of credit conversion factors are outlined below.

100% Conversion Factor

- Direct credit substitutes (general guarantees of indebtedness and guarantee-type instruments, including standby letters of credit serving as financial guarantees for, or supporting, loans and securities).
- Acquisitions of risk participations in bankers' acceptances and participations in direct credit substitutes (for example, standby letters of credit).
- Sale and repurchase agreements.
- Forward agreements (contractual obligations) to purchase assets, including financing facilities with certain drawdown.
- Written put options on specified assets with the character of a credit enhancement.[24]

50% Conversion Factor

- Transaction-related contingencies (for example, bid bonds, performance bonds, warranties, and standby letters of credit related to a particular transaction).
- Commitments with an original maturity exceeding one year, including underwriting commitments and commercial credit lines.
- Revolving underwriting facilities (RUFs), note issuance facilities (NIFs) and other similar arrangements.

20% Conversion Factor

- Short-term self-liquidating trade-related contingencies, including commercial/documentary letters of credit.

0% Conversion Factor

- Commitments with an original maturity of one year or less or that are unconditionally cancellable at any time without prior notice.

[24] Written put options expressed in terms of market rates for currencies or financial instruments bearing no credit risk are excluded from the framework.

Categories of off-balance sheet instruments are described in Annex I (section 8-10) of this guideline.

Separate credit conversion factors have been developed for forwards, swaps, purchased options and similar derivatives. The maturity of these contracts is also taken into account in their conversion to the credit equivalent on-balance sheet instrument. Under specified circumstances companies may net off-balance sheet exposures (reference 8-7).

Counterparty Factors

The counterparty factors are as follows. These factors apply only to section 8 of the Guideline.

Factor		Counterparty
Regular	**Qualifying Participating**	
0%	0%	OECD central governments and central banks or organizations with the guarantee of OECD central governments (e.g., Export Development Corporation); provincial and territorial governments and agents of the federal, provincial or territorial governments in Canada whose debts are, by virtue of their enabling legislation, direct obligations of the parent government.
1.6%	0.8%	PSEs directly and wholly owned by a federal, provincial or territorial government in accordance with section 3-3; Canadian municipalities, school boards and universities and hospitals and social service programs that receive regular government financial support; Multilateral development banks (reference 8-4); OECD incorporated banks, Canadian life insurers and Canadian deposit-taking institutions and their branches (reference 8-5); Non-domestic OECD public-sector entities, excluding central government.
4%	2%	Credit risk equivalent of off-balance sheet exposures arising from forwards, swaps, purchased options and other similar derivatives to counterparties that would otherwise attract an 8% factor.
8%	4%	Private sector; Central governments and central banks outside the OECD; entities in which a government may have an ownership interest but that do not meet the 0% or 1.6% factor criteria in section 3-3 (Guarantees by PSEs); entities directly and wholly owned by a government, but where the assignment of a factor of 1.6% would, in the opinion of the parent government, seriously disadvantage private sector competition; U.N. agencies (other than the IBRD and the IFC) and EUROFIMA; Non-bank parents or affiliates of OECD banks, unless specifically guaranteed by an OECD bank or a Canadian life insurer or a Canadian deposit-taking institution; Council of Europe and the European Space Agency and all other international agencies not included in the list of institutions classified as Multilateral Development Banks (reference 8-4) unless explicitly and unconditionally guaranteed by OECD governments.

Multilateral Development Banks (MDBs) and OECD Countries

The following institutions are classified as MDBs:

International Bank for Reconstruction and Development (IBRD)
International Finance Corporation (IFC)
Inter-American Development Bank (IDB)
Asian Development Bank (AsDB)
African Development Bank (AfDB)
European Investment Bank (EIB)
Caribbean Development Bank (CDB)
Nordic Investment Bank (NIB)
Social Development Fund (SDF)
European Bank for Reconstruction and Development (EBRD)

For purposes of this guideline, the OECD comprises countries that are full members of the OECD or that have concluded special lending arrangements with the IMF associated with the Fund's General Arrangements to Borrow, but exclude any country within this group that has rescheduled its external sovereign debt in the previous five years. Currently, OECD countries qualifying for a preferential counterparty factor are:

Australia	Hungary	Norway
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Italy	Saudi Arabia
Czech Republic	Japan	Spain
Denmark	Korea	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	the Netherlands	United Kingdom
Greece	New Zealand	United States

For the purpose of determining whether a bank is in the OECD, the place of incorporation is relevant. For example, a loan made to a branch located in an OECD country of a non-OECD incorporated bank should be classified as a loan to a non-OECD bank.

Similarly, a loan made to a subsidiary of a non-OECD bank, where the subsidiary is located and incorporated in an OECD country, should be classified as a loan to an OECD bank.

Canadian Life Insurers, Deposit-Taking Institutions and Banks

Canadian life insurers include federally and provincially regulated institutions that carry on life insurance business. Canadian deposit-taking institutions include federally and provincially regulated institutions that take deposits and lend money. The latter include banks, trust and loan companies and cooperative credit societies.

The term "bank" refers to those institutions that are regarded as banks in the countries in which they are incorporated and supervised by the appropriate banking supervisory or monetary authority. In general, banks will engage in the business of banking and have the power to accept deposits in the regular course of business.

For banks incorporated in countries other than Canada, the definition of bank will be that used in the capital adequacy regulations of the host jurisdiction. Where the host jurisdiction does not have a definition of bank for capital adequacy purposes, a foreign institution in whose name the word bank, banker or banking appears will be considered a bank for this purpose, with the exception of international institutions or agencies such as development banks.

Forwards, Swaps, Purchased Options and Other Similar Derivative Contracts

The treatment of forwards, swaps, purchased options and similar derivative contracts needs special attention because companies are not exposed to credit risk for the full face value of their contracts (notional principal amount), but only to the potential cost of replacing the cash flow (on contracts showing a positive value) if the counterparty defaults. The credit equivalent amounts are calculated using the current exposure method (reference section 8-6) and are assigned a factor appropriate to the counterparty. However, in recognition of the quality of market participants, a 4% factor (2% for qualifying participating) in respect of counterparties that would otherwise attract an 8% factor (4% for qualifying participating) is applied.

The add-on (reference section 8-6) applied in calculating the credit equivalent amount depends on the maturity of the contract and on the volatility of the rates and prices underlying that type of instrument. Instruments traded on exchanges may be excluded where they are subject to daily receipt and payment of cash variation margin. Options purchased over the counter are included with the same conversion factors as other instruments. Credit derivatives, whether traded on an exchange or over the counter, are not subject to a capital charge for potential replacement cost.

A. Interest rate contracts include:

- single currency interest rate swaps;
- basis swaps;
- forward rate agreements and products with similar characteristics;
- interest rate futures; and
- interest rate options purchased.

B. Exchange rate[25] contracts include:

- gold contracts[26];
- cross-currency swaps;
- cross-currency interest rate swaps;
- outright forward foreign exchange contracts;
- currency futures; and
- currency options purchased.

[25] Exchange rate contracts with an original maturity of 14 calendar days or less may be excluded.

[26] Gold contracts are treated the same as exchange rate contracts for the purpose of calculating credit risk except that contracts with original maturity of 14 calendar days or less are included.

C. Equity contracts include:
- futures
- forwards;
- swaps;
- purchased options; and
- similar derivative contracts based on both individual equities as well as on equity indices.

D. Precious metals (e.g., silver, platinum, and palladium) contracts, except gold contracts, include:
- futures
- forwards;
- swaps;
- purchased options; and
- similar contracts based on precious metals.

E. Contracts on other commodities include:
- futures
- forwards;
- swaps;
- purchased options;
- similar derivatives contracts based on energy contracts, agricultural contracts, base metals (e.g., aluminum, copper, and zinc); and
- other non-precious metal commodity contract.

A company should calculate the credit equivalent amount of these contracts using the **current exposure method.** Under this method, a company adds:

- the total replacement cost (obtained by "marking to market") of all its contracts with positive value; and

- an amount for potential future credit exposure (or "add-on"). This is calculated by multiplying the notional principal amounts by the following factors:

Residual Maturity	Interest Rate	Exchange Rate and Gold	Equity	Precious Metals Except Gold	Other Commodities
One year or less	0.0%	1.0%	6.0%	7.0%	10.0%
Over one year to five years	0.5%	5.0%	8.0%	7.0%	12.0%
Over five years	1.5%	7.5%	10.0%	8.0%	15.0%

Notes:

1. Instruments traded on exchanges do not require capital for counterparty credit risk where they are subject to daily margining requirements.
2. For contracts with multiple exchanges of principal, the factors are to be multiplied by the number of remaining payments in the contract.
3. For contracts that are structured to settle outstanding exposure following specified payment dates and where the terms are reset so that the market value of the contract is zero on these specified dates, the residual maturity is considered to be the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year and that meet the above criteria, the add-on factor is subject to a floor of 0.5%.
4. Contracts not covered by any of the columns of this matrix are to be treated as "other commodities."
5. No potential credit exposure would be calculated for single currency floating/floating interest rate swaps; the credit exposure on these contracts would be evaluated solely on the basis of their mark-to-market value.
6. The add-ons are based on effective rather than stated notional amounts. In the event that the stated notional amount is leveraged or enhanced by the structure of the transaction, companies must use the actual or effective notional amount when determining potential future exposure. For example, a stated notional amount of $1 million with payments calculated at two times LIBOR would have an effective notional amount of $2 million.
7. Potential credit exposure is to be calculated for all OTC contracts (with the exception of single currency floating/floating interest rate swaps), regardless of whether the replacement cost is positive or negative.

Netting of Forwards, Swaps, Purchased Options and Other Similar Derivative Contracts

Companies may net contracts that are subject to novation or any other legally valid form of netting. Novation refers to a written bilateral contract between two counterparties under which any obligation to each other to deliver a given currency on a given date is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previous gross obligations.

Companies who wish to net transactions under either novation or another form of bilateral netting will need to satisfy OSFI that the following conditions are met:

i. The company must have a netting contract or agreement with each counterparty which creates a single legal obligation, covering all included transactions subject to netting. The result of such an arrangement would be that the company only has one obligation for payment or one claim to receive funds based on the net sum of the positive and negative mark-to-market values of all the transactions with that counterparty in the event of default, bankruptcy, liquidation or similar circumstances.

ii. The company must have written and reasoned legal opinions that in the event of any legal challenge the relevant courts and authorities would find the exposure to be the net amount under; a) the law of the jurisdictions where the counterparties are incorporated and the laws of any jurisdiction applicable to branches involved; b) the law governing the individual transactions; and c) the law governing any contracts or agreements required to effect netting.

iii. The company must have procedures in place to ensure that a regular review of the legal characteristics of netting arrangements for possible changes in law is undertaken to maintain the validity of such contracts.

Any contract containing a walkaway clause will not be eligible to qualify for netting for the purpose of calculating capital requirements. A walkaway clause is a provision within the contract that permits a non-defaulting counterparty to make only limited payments, or no payments, to the defaulter.

Credit exposure on bilaterally netted forwards, swaps, purchased options and similar derivatives transactions is calculated as the sum of the net mark-to-market replacement cost, if positive, plus an add-on based on the notional principal of the individual underlying contracts. However, for purposes of calculating potential future credit exposure of contracts subject to legally enforceable netting agreements in which notional principal is equivalent to cash flows, notional principal is defined as the net receipts falling due on each value date in each currency.

The reason that these contracts are treated as a single contract is that offsetting contracts in the same currency maturing on the same date will have lower potential future exposure as well as lower current exposure. For multilateral netting schemes, current exposure (i.e., replacement cost) is a function of the loss allocation rules of the clearing house.

The calculation of the gross add-ons should be based on the legal cash flow obligations in all currencies. This is calculated by netting all receivable and payable amounts in the same currency for each value date. The netted cash flow obligations are converted to the reporting currency using the current forward rates for each value date. Once converted the amounts receivable for the value date are added together and the gross add-on is calculated by multiplying the receivable amount by the appropriate add-on factor.

The future credit exposure for netted transactions (A_{Net}) equals the sum of: (i) 40% of the add-on as presently calculated (A_{Gross})[27]; and (ii) 60% of the add-on multiplied by the ratio of net current replacement cost to positive current replacement cost (NPR). Where,

NPR = level of net replacement cost/level of positive replacement cost for transactions subject to legally enforceable netting agreements.

The calculation of NPR can be made on a counterparty by counterparty basis or on an aggregate basis for all transactions subject to legally enforceable netting agreements. On a counterparty by counterparty basis a unique NPR is calculated for each counterparty. On an aggregate basis, one NPR is calculated and applied to all counterparties.

Steps for determining the credit equivalent amount of netted contracts

Step 1. For each counterparty subject to bilateral netting determine the add-ons and replacement costs of each transaction. A worksheet similar to that set out below could be used for this purpose:

Counterparty

Transaction	Notional Principal Amount	X	Add-on Factor (ref. 8-6)	=	Potential Credit Exposure	Positive Replacement Cost	Negative Replacement Cost
1							
2							
3							
etc.							
Total					A_{gross}	R^+	R^-

[27] A_{gross} equals the sum of the potential future credit exposures (i.e., notional principal amount of each transaction times the appropriate add-on factors from 8-6) for all transactions subject to legally enforceable netting agreements.

Step 2. Calculate the net replacement cost for each counterparty; it is equal to the greater of:

- zero, or
- the sum of the positive and negative replacement costs ($R^+ + R^-$) (note: negative replacement costs for one counterparty cannot be used to offset positive replacement costs for another counterparty).

Step 3. Calculate the NPR. For companies using the counterparty by counterparty basis, the NPR is the net replacement cost (from step 2) divided by the positive replacement cost (amount R^+ calculated in step 1).

For companies using the aggregate basis, the NPR is the sum of the net replacement costs of all counterparties subject to bilateral netting divided by the sum of the positive replacement costs for all counterparties subject to bilateral netting.

A simple example of calculating the NPR ratio is set out below:

Transaction	**Counterparty 1**		**Counterparty 2**		**Counterparty 3**	
	Notional amount	**Mark to Market Value**	**Notional amount**	**Mark to market value**	**Notional amount**	**Mark to market value**
Transaction 1	100	10	50	8	30	-3
Transaction 2	100	-5	50	2	30	1
Positive replacement cost (R^+)		10		10		1
Net replacement cost (NR)		5		10		0
NPR (per counterparty)	0.5		1		0	
NPR (aggregate)	$\sum NR/\sum R^+ = 15/21 = 0.71$					

Step 4. Calculate A_{Net}. A_{Net} must be calculated for each counterparty subject to bilateral netting, however the NPR applied will depend on whether the company is using the counterparty by counterparty basis or the aggregate basis. The company must choose which basis it will use and use it consistently for all netted transactions.

A_{Net} is:

for netted contracts where the net replacement cost is > 0

$(.4 * A_{gross}) + (.6 * NPR * A_{gross})$

for netted contracts where the net replacement cost = 0

$.4 * A_{gross}$

Step 5. Calculate the credit equivalent amount for each counterparty by adding the net replacement cost (step 2) and A_{Net} (step 4). Aggregate the counterparties by the factors appropriate to each type of counterparty and enter the total credit equivalent amount on the appropriate *Contracts Subject to Netting* page.

Note: Contracts may be subject to netting among different types of derivative instruments (e.g., interest rate, foreign exchange, equity, etc.). If this is the case, allocate the net replacement cost to the types of derivative instrument by pro-rating the net replacement cost among those instrument types which have a gross positive replacement cost.

Example of Netting Calculation for Potential Future Exposure with Contracts Subject to Novation

Assume an institution has 6 contracts with the same counterparty and has a legally enforceable netting agreement with that counterparty:

Contract	Notional Principal Amount	Marked to Market
A	10	1
B	20	-2
C	10	-1
D	40	4
E	30	3
F	20	-2

Contracts A and B are subject to novation, as are contracts C and D. Under novation, the two contracts are replaced by one new contract. Therefore to calculate the capital requirements, the institution would replace contracts A and B for contract A+ and contracts C and D for contract C+, netting the notional amounts and calculating a new marked to market amount.

Contract	Notional Principal Amount	Marked to Market
A+	10	-1
C+	30	3
E	30	3
F	20	-2

Assume the add-on factor for all contracts is 5%. The potential credit exposure is calculated for each contract. A_{Gross} is the sum of the potential credit exposures:

Contract	Notional Principal Amount	Add-on Factor (5%)	Potential Credit Exposure	Positive Replacement Cost	Negative Replacement Cost
A+	10	.05	0.5	0	-1
C+	30	.05	1.5	3	0
E	30	.05	1.5	3	0
F	20	.05	1.0	0	-2
Total			4.5	6	-3

The net replacement cost is 3 (i.e., 6-3; the greater of zero or the sum of the positive and negative replacement costs).

The NPR is 0.5 (i.e., 3/6; the net replacement cost divided by the positive replacement cost).

A_{Net} is (.4*4.5) + (.6*.5*4.5) = 3.15.

The credit equivalent amount is 6.15 (i.e., 3+3.15; the net replacement cost plus A_{Net}).

Repurchase and Reverse Repurchase Agreements

A securities repurchase (repo) is an agreement whereby a transferor agrees to sell securities at a specified price and repurchase the securities on a specified date and at a specified price. Since the transaction is regarded as a financing for accounting purposes, the securities remain on the balance sheet. Given that these securities are temporarily assigned to another party, the factor accorded to the asset should be the higher of the factor of the security and the factor of the counterparty (reference section 8-3) to the transaction (net of any eligible collateral (see section 3-2)).

A reverse repurchase agreement is the opposite of a repurchase agreement, and involves the purchase and subsequent sale of a security. Reverse repos are treated as collateralized loans, reflecting the economic reality of the transaction. The risk is therefore to be measured as an exposure to the counterparty (reference section 8-3). Where the asset temporarily acquired is a security that attracts a preferential factor, this would be recognized as collateral and the factor would be reduced accordingly.

Guarantees Provided in Securities Lending

In securities lending, companies can act as principal to the transaction by lending their own securities or as agent by lending securities on behalf of clients.

When the company lends its own securities, the requirements are defined in section 3-5 of the Guideline.

When the company, acting as agent, lends securities on behalf of a client and guarantees that the securities lent will be returned or the company will reimburse the client for the current market value, the credit risk is based on the counterparty credit risk of the borrower of the securities. This risk could be reduced if the lender held eligible collateral (reference section 3-2).

Annex I

Categories of Off-Balance Sheet Instruments

The definitions in this section apply to off-balance sheet exposures.

Direct Credit Substitutes (100% conversion factor)

Direct credit substitutes include guarantees or equivalent instruments backing financial claims. With a direct credit substitute, the risk of loss to the company is directly dependent on the creditworthiness of the counterparty.

Examples of direct credit substitutes include:

- guarantees given on behalf of customers to stand behind the financial obligations of the customer and to satisfy these obligations should the customer fail to do so; for example, guarantees of:
    - payment for existing indebtedness for services,
    - payment with respect to a purchase agreement,
    - lease, loan or mortgage payments,
    - payment of uncertified cheques,
    - remittance of (sales) tax to the government,
    - payment of existing indebtedness for merchandise purchased,
    - payment of an unfunded pension liability, and
    - reinsurance of financial obligations;
- standby letters of credit or other equivalent irrevocable obligations, serving as financial guarantees, such as letters of credit supporting the issue of commercial paper;
- risk participations in bankers' acceptances and risk participations in financial letters of credit. Risk participations constitute a guarantee by the acquiring company such that if there is a default by the underlying obligor, they will indemnify the selling company for the full principal and interest attributable to them;
- securities lending transactions, where the company is liable to its customer for any failure to recover the securities lent.

Transaction-related Contingencies (50% conversion factor)

Transaction-related contingencies relate to the ongoing business activities of a counterparty, where the risk of loss to the reporting institution depends on the likelihood of a future event that is independent of the creditworthiness of the counterparty. Essentially, transaction-related contingencies are guarantees that support particular performance of non financial or commercial contracts or undertakings rather than supporting customers' general financial obligations. Performance-related guarantees specifically exclude items relating to non-performance of financial obligations.

Performance-related and non-financial guarantees include items such as:

- performance bonds, warranties and indemnities. Performance standby letters of credit represent obligations backing the performance of non-financial or commercial contracts or undertakings. These include arrangements backing:
    - subcontractors' and suppliers' performance,
    - labour and material contracts,
    - delivery of merchandise, bids or tender bonds,

  and guarantees of repayment of deposits or prepayments in cases of non-performance;

- customs and excise bonds. The amount recorded for such bonds should be the reporting institution's maximum liability.

Trade-related Contingencies (20% conversion factor)

These include short-term self-liquidating trade-related items such as commercial and documentary letters of credit issued by the company that are, or are to be, collateralized by the underlying shipment.

Letters of credit issued on behalf of a counterparty back to back with letters of credit of which the counterparty is a beneficiary ("back to back" letters) should be reported as documentary letters of credit.

Letters of credit advised by the company for which the company is acting as reimbursement agent should not be considered a risk asset.

Sale and Repurchase Agreements (100% conversion factor)

A *repurchase agreement* is a transaction that involves the sale of a security or other asset with the simultaneous commitment by the seller that after a stated period of time, the seller will repurchase the asset from the original buyer at a pre-determined price. A *reverse repurchase agreement* consists of the purchase of a security or other asset with the simultaneous commitment by the buyer that after a stated period of time, the buyer will resell the asset to the original seller at a predetermined price.

Forward Asset Purchases (100% conversion factor)

A commitment to purchase a loan, security or other asset at a specified future date, usually on prearranged terms.

Forward/Forward Deposits (100% conversion factor)

An agreement between two parties whereby one will pay and the other receive an agreed rate of interest on a deposit to be placed by one party with the other at some predetermined date in the future. Such deposits are distinct from future forward rate agreements in that, with forward/forwards, the deposit is actually placed.

Partly Paid Shares and Securities (100% conversion factor)

Transactions where only a part of the issue price or notional face value of a security purchased has been subscribed and the issuer may call for the outstanding balance (or a further instalment), either on a date predetermined at the time of issue or at an unspecified future date.

Note Issuance/Revolving Underwriting Facilities (50% conversion factor)

These are arrangements whereby a borrower may issue short-term notes, typically three to six months in maturity, up to a prescribed limit over an extended period of time, commonly by means of repeated offerings to a tender panel. If at any time the notes are not sold by the tender at an acceptable price, an underwriter (or group of underwriters) undertakes to buy them at a prescribed price.

Commitments (see Annex II)

A *commitment* involves an obligation (with or without a material adverse change or similar clause) of the company to fund its customer in the normal course of business should the customer seek to drawdown the commitment. Normally commitments involve a written contract or agreement and a commitment fee, or some other form of consideration.

Future/Forward Rate Agreements (see Section 8-6)

These are agreements between two parties where, at some predetermined future date, a cash settlement will be made for the difference between the contracted rate of interest and the current market rate on a predetermined notional principal amount for a predetermined period.

Interest Rate Swaps (see Section 8-6)

In an *interest rate swap*, two parties contract to exchange interest service payments on the same amount of notional indebtedness. In most cases, fixed interest rate payments are provided by one party in return for variable rate payments from the other and vice versa. However, it is possible that variable interest payments may be provided in return for other variable interest rate payments.

Interest Rate Options and Currency Options (see Section 8-6)

An option is an agreement between two parties where the seller of the option, for compensation (premium/fee), grants the buyer the future right, but not the obligation, to buy from the seller, or to sell to the seller, either on a specified date or during a specified period, a financial instrument or commodity at a price agreed when the option is arranged. Other forms of interest rate options include interest rate capping agreements and collar (floor/ceiling) agreements.

Options traded on exchanges may be excluded where they are subject to daily margining requirements.

Forward Foreign Exchange Contracts (see Section 8-6)

A *forward foreign exchange contract* is an agreement between a company and a counterparty in which the company agrees to sell to or purchase from the counterparty a fixed amount of foreign currency at a fixed rate of exchange for delivery and settlement on a specified date in the future or within a fixed optional period.

Cross Currency Swaps (see Section 8-6)

A *cross currency swap* is a transaction in which two parties exchange currencies and the related interest flows for a period of time. Cross currency swaps are used to swap fixed interest rate indebtedness in different currencies.

Cross Currency Interest Rate Swaps (see Section 8-6)

Cross currency interest rate swaps combine the elements of currency and interest rate swaps.

Financial and Foreign Currency Futures (see Section 8-6)

A future is a standardized contractual obligation to make or take delivery of a specified quantity of a commodity (financial instrument, foreign currency, etc.) on a specified future date at a specified price established in a central regulated marketplace. These transactions are not to be reported where they are subject to daily margining requirements.

Precious Metals Contracts and Financial Contracts on Commodities (see Section 8-6)

Precious metals contracts and financial contracts on commodities can involve spot, forward, futures and options contracts. Precious metals are mainly gold, silver and platinum. Commodities are bulk goods such as grains, metals and foods traded on commodities exchange or on the spot market. For capital purposes, gold contracts are treated the same as foreign exchange contracts.

Non-equity Warrants (see Section 8-6)

Non-equity warrants include cash settlement options/contracts whose values are determined by the movements in a given underlying index, product or foreign exchange over time. Where non-equity warrants or the hedge for such warrants expose the financial institution to counterparty credit risk, the credit equivalent amount should be determined using the current exposure method for foreign exchange rate contracts.

Annex II

Commitments

Commitments are arrangements that obligate a company, at a client's request, to:

- extend credit in the form of loans or participations in loans, lease financing receivables, mortgages, overdrafts, acceptances, letters of credit, guarantees or loan substitutes; or
- purchase loans, securities, or other assets.

Normally, commitments involve a written contract or agreement and some form of consideration, such as a commitment fee.

Commitments exclude policy loans, i.e., part of a policy's cash value that has not been taken in the form of a policy loan.

Credit Conversion Factors

The credit conversion factor applied to a commitment is dependent on its maturity. Longer maturity commitments are considered to be of higher risk because there is a longer period between credit reviews and less opportunity to withdraw the commitment if the credit quality of the drawer deteriorates.

The conversion factors to be applied to commitments can generally be categorized as:

0% Commitments with an original maturity of one year and under.

Commitments with an original maturity of over one year where:

- the company has full discretion to withdraw the commitment at any time without notice; and
- the company conducts a formal review of the facility at least annually, thus giving it an opportunity to take note of any perceived deterioration in credit quality.

50% Commitments with an original maturity of over one year.

NIFs and RUFs.

The undrawn portion of a commitment to provide a loan that will be drawn down in a number of tranches, some less than and some over one year.

Forward commitments (where the company makes a commitment to issue a commitment) if the loan can be drawn down more than one year after the company's initial undertaking is signed.

Maturity

Companies should use original maturity (as defined below) to report these instruments.

Original Maturity

The maturity of a commitment should be measured from the date when the commitment was accepted by the customer, regardless of whether the commitment is revocable or irrevocable, conditional or unconditional, until the earliest date on which:

- the commitment is scheduled to expire, or

- the company can, at its option, unconditionally cancel the commitment.

A material adverse change clause is not considered to give sufficient protection for a commitment to be considered unconditionally cancellable.

Where the company commits to granting a facility at a future date (a forward commitment), the original maturity of the commitment is to be measured from the date the commitment is accepted until the final date that drawdowns are permitted.

Renegotiations of a Commitment

If both parties agree, a commitment may be renegotiated before its term expires. If the renegotiation process involves a credit assessment of the customer consistent with the company's credit standards, and provides the company with the total discretion to renew or extend the commitment and to change any other terms and conditions of the commitment, then on the date of acceptance by the customer of the revised terms and conditions, the original commitment may be deemed to have matured and a new commitment begun. If new terms are not reached, the original commitment will remain in force until its original maturity date.

This process must be clearly documented.

In syndicated and participated transactions, a participating company must be able to exercise its renegotiation rights independent of the other syndicate members.

Where these conditions are not met, the original start date of the commitment must be used to determine maturity.

Specific Types of Commitments

Undated/Open-ended Commitments

A 0% credit conversion factor is applied to undated or open-ended commitments, such as unused credit card lines, personal lines of credit, and overdraft protection for personal chequing accounts that are unconditionally cancellable at any time.

Evergreen Commitments

Open-ended commitments that are cancellable by the company at any time subject to a notice period do not constitute unconditionally cancellable commitments and are converted at 50%. Long-term commitments must be cancellable without notice to be eligible for the 0% conversion factor.

Commitments Drawdown in a Number of Tranches

A 50% credit conversion factor is applied to a commitment to provide a loan (or purchase an asset) to be drawn down in a number of tranches, some one year and under and some over one year. In these cases, the ability to renegotiate the terms of later tranches should be regarded as immaterial. Often these commitments are provided for development projects from which the company may find it difficult to withdraw without jeopardizing its investment.

Where the facility involves unrelated tranches, and where conversions are permitted between the over- and under-one-year tranches (i.e., where the borrower may make ongoing selections as to how much of the commitment is under one year and how much is over), then the entire commitment should be converted at 50%.

Where the facility involves unrelated tranches with no conversion between the over- and under-one-year tranches, then each tranche may be converted separately, depending on its maturity.

Commitments for Fluctuating Amounts

For commitments that vary in amount over the life of the commitment, such as the financing of a business subject to seasonal variation in cash flow, the conversion factor should apply to the maximum unutilized amount that can be drawn under the remaining period of the facility.

Commitment to Provide a Loan with a Maturity of Over One Year

A commitment to provide a loan that has a maturity of over one year but that must be drawn down within a period of less than one year may be treated as an under-one-year instrument, as long as any undrawn portion of the facility is automatically cancelled at the end of the drawdown period.

However, if through any combination of options or drawdowns, repayments and redrawn-downs, etc., the client can access a line of credit past one year, with no opportunity for the company to

unconditionally cancel the commitment within one year, the commitment shall be converted at 50%.

Commitments for Off-Balance Sheet Transactions

Where there is an undertaking to provide a commitment on an off-balance sheet item, companies are to apply the lower of the two applicable credit conversion factors.

Segregated Fund Guarantee Risk

Documentation and Reporting

Segregated Fund Guarantee Risk

This component is for the risk associated with investment or performance-related guarantees on segregated funds or other similar products. The risk is determined using prescribed or approved factors, or an approved internal model.

OSFI permits, subject to materiality considerations, criteria and explicit prior approval, the use of internal models for the development of segregated fund capital requirements. Institutions seeking to use their internal models must follow the requirements outlined in OSFI's *Instruction Guide on Use of Internal Models for Determining Required Capital for Segregated Fund Risks (MCCSR)*.

Products

Capital factors are provided for a variety of standardized product forms for guaranteed minimum death and maturity benefits commonly offered for segregated fund guarantee products in Canada and the United States. Below is a general description of the product forms modelled. More details can be found in Table 5 of Section 9-4.

Guaranteed Minimum Death Benefit (GMDB) forms modelled include the following:

1) ***Return of Premium (ROP):*** provides a death benefit guarantee equal to the higher of the account value or the premiums paid.

2) ***5% Annual Roll-up (ROLL):*** provides a guaranteed benefit that increases 5% per annum compounded at each contract anniversary with the guarantee frozen at age 80.

3) ***Maximum Anniversary Value/Annual Ratchet (MAV):*** automatic annual reset of guarantee at each contract anniversary with resets frozen at age 80.

4) ***10-year Rollover Contract (GMDB_10):*** guarantee can reset and term-to-maturity also will reset to 10 years. No resets are permitted in the final 10 years prior to contract maturity.

Guaranteed Minimum Maturity Benefits (GMMB) forms modelled include:

1) ***Fixed Maturity Date (FIXED):*** guarantee is level and applies up to the fixed maturity date.

2) ***10-year Rollover Maturity Benefit (GMMB_10):*** guarantee can be reset and term-to-maturity also resets to 10 years. No resets are permitted in the 10 years prior to contract maturity.

3) ***Guaranteed Minimum Surrender Benefit After 10 Years (GMSB_10):*** guarantee comes into effect 10 years after contract issue. If the guaranteed value at 10 years is greater than the account value at surrender, a "top-up" benefit equal to the difference is paid.

Documentation and Reporting

Given the complexity of this calculation, for auditing purposes the Appointed Actuary is required to keep supporting schedules of all the calculations for each step building up to the final numbers detailed in the MCCSR form. Also, the Appointed Actuary is required to detail the calculation in the segregated fund section of the Appointed Actuary's Report. Forms 90.010 and 90.015 must be completed.

Phase-in of New Requirement

OSFI's prescribed factors have been updated to reflect recent market experience, and will be phased in over a period of two years beginning at year-end 2005. The capital requirement during the phase-in period for companies using prescribed factors will be:

$$A + \text{Phase-in rate} \times (B - A)$$

where A is the capital requirement for the company's current portfolio calculated using the factors in effect at year-end 2004, B is the capital requirement for the company's current portfolio calculated using the factors described in this section, and the phase-in rate is 12.5% multiplied by the number of quarters that have elapsed since the end of Q3 2005.

As an alternative to phasing in the new requirement, a company may adopt the new prescribed factors in full (using a phase-in rate of 100%) at year-end 2005 and thereafter if the capital requirement for its current portfolio calculated using the new factors is higher than the capital requirement for its current portfolio calculated using the factors in effect at year-end 2004.

Form Details

The columns of the reporting form on page 90.010 are filled in as follows:

Column 01 - **Guaranteed Value**

This is the amount guaranteed in all segregated funds. If the funds are subject to guarantees of differing amounts, for example 100% on death and 75% on maturity, report the larger amount here.

Column 02 - **Market Value**

This is the market value of all segregated funds.

Column 03 - **Total Gross Calculated Requirements**

This is the total gross calculated requirement for all segregated funds.

Column 04 - **Credit for Reinsurance Ceded**

Report credit for amounts ceded in column 04. Note that amounts ceded to unregistered reinsurers per Guideline B-3, must be deducted from Total Capital on page 20.030, line 085 of the OSFI 87 form by Canadian companies, and on page 25.010, line 050 of the OSFI 86 form by foreign branches. Deposits held for unregistered reinsurance, for a period not less than the remaining guarantee term, in excess of policy liabilities and any required margins (see section 1-2) can be used to reduce the net required segregated fund risk component on the reinsured policies to a minimum of zero.

Column 05 - **Net Requirements**

This is determined as:

(Total Gross Calculated Requirements – Credit for Reinsurance Ceded)

Column 06 – **Credit for OSFI-Approved Hedging Programs**

This is the dollar equivalent of the maximum allowable reduction. It is determined as:

(Maximum allowable percentage reduction * Net Requirements)

where the maximum percentage reduction is limited to 50% of the percentage reduction shown by the models. See Instruction Guide "Capital Offset for Segregated Fund Hedging Programs (MCCSR)".

Column 07 - **Net Actuarial Liabilities Held**

This is the total net actuarial liability held on the balance sheet for segregated fund guarantee risks.

Column 08 - **Net Required Component**

This is determined as:

(Net Requirements (column 5) – Credit for OSFI-Approved Hedging Programs – Net Actuarial Liabilities Held)

Line 099 must not be less than zero in total.

The columns of the reporting form on page 90.015 are filled in as follows:

Column 01 - **Factor Requirements**

This is the gross calculated requirement based on the OSFI-approved factors.

Column 02 - **OSFI Approved Internal Model Requirements**

For OSFI-approved models, this is the gross calculated requirement based on company-specific internal models.

Column 03 - **Total Gross Calculated Requirements**

For OSFI-approved models, transition rules apply:

In the first year of approval, Total Gross Calculated Requirements = 50% of the Factor Requirements + 50% of the Internal Model Requirements.

Thereafter, Total Gross Calculated Requirements = 100% of the Internal Model Requirements.

Otherwise, Total Gross Calculated Requirements = 100% of the Factor Requirements.

Column 04 - **Credit for Reinsurance Ceded**

Report credit for amounts ceded in column 04. Note that policy liabilities ceded to unregistered reinsurers with respect to foreign business, per Guideline B-3, must be deducted from Total Capital on page 20.030, line 085 of the OSFI 87 form by Canadian companies, and on page 25.010, line 050 of the OSFI 86 form by foreign branches. Deposits held for unregistered reinsurance, for a period not less than the remaining guarantee term, in excess of policy liabilities and any required margins (see section 1-2) can be used to reduce the net required segregated fund risk component on the reinsured policies to a minimum of zero.

Column 05 - **Net Requirements**

This is determined as:

(Total Gross Calculated Requirements – Credit for Reinsurance Ceded)

Column 06 - **Credit for OSFI-Approved Hedging Programs**

This is the dollar equivalent of the maximum allowable reduction. It is determined as:

(Maximum allowable percentage reduction * Net Requirements)

where the maximum percentage reduction is limited to 50% of the percentage reduction shown by the models. See OSFI Instruction Guide "*Capital Offset for Segregated Fund Hedging Programs (MCCSR)"*

Column 07 - **Net Actuarial Liabilities Held**

This is the total net actuarial liability held on the balance sheet for segregated fund guarantee risks.

Column 08 - **Net Required Component**

This is determined as:

(Net Requirements (column 5) – Credit for OSFI Approved Hedging Programs – Net Actuarial Liabilities Held)

Note that the amount reported on page 90.010, column 08, line 230 should be the same as the amount reported on page 90.015, column 08, line 100.

Total Gross Calculated Requirement

It is expected that the MCCSR methodology for Total Gross Calculated Requirement ("*TGCR*") will be applied on a policy-by-policy basis (i.e., seriatim). If the company adopts a cell-based approach, only materially similar contracts should be grouped together. Specifically, all policies comprising a "cell" must display substantially similar characteristics for those attributes expected to affect risk-based capital (e.g., definition of guaranteed benefits, attained age, policy duration, years-to-maturity, market-to-guaranteed value, asset mix, etc.).

The portfolio *TGCR* is the sum of the *TGCR* calculations for each policy or cell. The result for any given policy (cell) may be negative, zero or positive. In total, the TGCR cannot be negative.

The *TGCR* for a given policy is equal to: $TGCR = GV \times \hat{f}\left(\tilde{\theta}\right) - AV \times \hat{g}\left(\tilde{\theta}\right)$, where GV = current guaranteed minimum benefit, AV = current account balance, $\hat{f}\left(\tilde{\theta}\right)$ = benefit cost factor, $\hat{g}\left(\tilde{\theta}\right)$ = margin offset factor and $\tilde{\theta}$ is a vector that defines the risk characteristics for the policy. The factors $\hat{f}\left(\tilde{\theta}\right)$ and $\hat{g}\left(\tilde{\theta}\right)$ are described more fully in section 9-6. The *TGCR* is calculated separately for each guaranteed minimum benefit (i.e., death, maturity and surrender).

The model assumptions for the *TGCR* Factors are documented in Sections 9-2-5 and 9-2-6.

There are four (4) major steps in determining the *TGCR* for a given policy/cell:

a) Classify the asset exposure (Section 9-3);
b) Determine the risk attributes (Section 9-4);
c) Retrieve the appropriate nodes (Section 9-5);
d) Use the supplied functions to determine the requirement (Section 9-6).

The first step requires the company to categorize the asset value for the given policy/cell by mapping the entire exposure to one of the prescribed "fund classes" as described in Section 9-3. *TGCR* factors are provided for each asset class.

The second step requires the company to determine (or derive) the appropriate attributes for the given policy or cell. The attributes needed to access the factor tables and calculate the required values are:

- Product form ("Guarantee Definition"), *P*.
- Guarantee level, *G*.
- Adjustment to guaranteed value upon partial withdrawal ("GMDB/GMMB Adjustment"), *A*.
- Fund class, *F*.

- Attained age of the policyholder, X, (for GMDB only, use a 4-year setback for female lives).
- Contract maturity age, M, (for GMDB only, use a 4-year setback for female lives).
- Time-to-next maturity date, T.
- Ratio of account value to guaranteed value, ϕ.
- Total "equivalent" account-based charges, *MER* ("management expense ratio").
- Reset utilization rate, R (where applicable).
- In-the-money termination rate, S (guaranteed surrender benefits only).

Other required policy values include:

- Total account value on which the guaranteed benefit is calculated, *AV*.
- Current *GMDB*, *GMMB* and/or *GMSB*.
- Total net spread available to fund guaranteed benefits ("margin offset"), α.

The next steps – retrieving the appropriate nodes and using the supplied functions to determine the requirement – are explained in Sections 9-5 and 9-6. Software tools have been developed to assist companies in these efforts. If an insurer is unable to use the supplied tools, it will be required to develop software of its own. In such a situation, the insurer should contact OSFI for specific guidance on how to develop its own lookup and extraction routines. A calculation example demonstrating the application of the various component factors to a sample policy is provided in Sections 9-6-6 to 9-6-9.

In this document, *GMDB, GMMB, GMSB* are generically denoted by *GV*. *AV* generically denotes either Account Value or Market Value. The total "equivalent" account charges should include *all* amounts assessed against policyholder accounts, expressed as a level spread per year (in basis points). This quantity is called the Management Expense Ratio ("MER") and is defined as the average amount (in dollars) charged against policyholder funds in a given year divided by average account value. Normally, the MER would vary by fund class and be the sum of investment management fees, mortality & expense charges, guarantee fees/risk premiums, etc. The total spread available to fund the guaranteed benefits (i.e., GMDB, GMMB, GMSB costs) is called the "margin offset" (denoted by α) and should be net of spread-based costs and expenses (e.g., net of maintenance expenses, investment management fees, trailer commissions, amounts required to provide for amortization of deferred acquisition costs, etc.). Section 9-7 describes how to determine *MER* and α .

The GMDB/GMMB/GMSB definition for a given policy/cell may not exactly correspond to those provided. In some cases, it may be reasonable to use the factors/formulas for a different product form. In other cases, the company might determine the TGCR based on two different guarantee definitions and interpolate the results to obtain an appropriate value for the given policy/cell. However, if the policy form is sufficiently different from those provided and there is

no practical or obvious way to obtain a reasonable result, the insurer should follow the instructions outlined in Section 9-9.

The general form of the *TGCR* may be written as:

$$TGCR = GV \times h(\circ) \times w(\circ) \times f(\circ) - \frac{\alpha}{100} \times AV \times g(\circ)$$

where:

GV = current guaranteed minimum benefit (dollars)

AV = current account value (dollars)

$f(\circ) = f(\tilde{\theta})$ = cost factor per \$1 of GV

$g(\circ) = g(\tilde{\theta})$ = margin offset factor per \$1 of AV (assuming 100 bps of available spread)

$h(\circ) = h(\tilde{\theta})$ = asset mix diversification factor

$w(\circ) = w(\tilde{\theta})$ = time diversification factor

Under this notation, $\tilde{\theta}$ is used to generically represent the risk attribute set (e.g., product form, guaranteed level, asset class, attained age, etc.) for the policy, or some relevant subset thereof. α is the company-determined net spread ("margin offset", in basis points per annum) available to fund the guaranteed benefits.

Where more than one feature (i.e., guaranteed benefit) is present in a product, unless the company has a justifiable alternative for allocating the total available spread between the benefit types (e.g., explicitly defined risk charges), the split should be based on the proportionate gross guaranteed benefit costs. An example is provided in section 9-6-6 to 9-6-9 to illustrate this concept.

In practice, $f(\circ)$, $g(\circ)$, $h(\circ)$ and $w(\circ)$ are values interpolated from the factor grid. The use of the factor grid is discussed more fully in Section 9-6. The factor grid is a large pre-computed table developed using stochastic modeling for a wide array of combinations of the risk attribute set. The risk attribute set is defined by those policy/product characteristics that affect the risk profile (exposure) of the business: product form (guarantee definition), fund class, attained age, AV/GV ratio, time-to-maturity, etc.

Assumptions for TGCR Methodology Published Factors

Each node in the factor grid is effectively the modeled result for a given "cell" assuming a $100 single deposit.

Table 1: Model Assumptions & Product Characteristics

Account Charges (MER)	Vary by fund class. See Table 2 later in this section.
Base Margin Offset	100 basis points per annum.
GMDB Description	▪ ROP = return of premium. ▪ ROLL = 5% compound roll-up, frozen at age 80. ▪ MAV = annual ratchet (maximum anniversary value), frozen at age 80. ▪ GMDB_10 = 10-year rollover contract.
GMMB & GMSB Descriptions	▪ FIXED = fixed maturity date. ▪ GMSB_10 = 10-year guaranteed surrender benefit. ▪ GMMB_10 = 10-year rollover maturity benefit.
GV Adjustment on Withdrawal	"Pro-Rata by Market Value" and "Dollar-for-Dollar" are tested separately.
Surrender Charges	Ignored (i.e., zero).
Base Policy Lapse Rate	6% p.a. at all policy durations. See also "Dynamic Lapse Multiplier".
Partial Withdrawals	Flat 4% p.a. at all policy durations (as a % of AV). No dynamics.
(a) Rollover (Renewal) Rate	85% at the end of each 10-year term (GMDB_10 and GMMB_10 only).
Dynamic Lapse Multiplier	Actual lapse rate = $\lambda \times$ [Base Policy Lapse Rate], where: $\lambda = MIN\left[\lambda^{+}, MAX\left[\lambda^{-}, \left[a + b \times \left(\frac{AV}{GV}\right)\right] \times \left[c + d \times MIN(h, T)\right]\right]\right]$ $\lambda^{+} = 1.6667$, $\lambda^{-} = 0.3333$, $a = -0.0952$, $b = 0.8010$, $c = 0.6279$, $d = 0.0654$, $h = 10$ and T = time-to-next maturity.
(b) Mortality	100% of CIA 1986–92 ALB Male Aggregate Ultimate.
Fixed Expenses, Annual Fees	Ignored (i.e., zero).
Discount Rate	5.5% annual effective (non-dynamic).
(c) Elective Reset of GV	Whenever the AV/GV ratio exceeds 115% (maximum 2 resets per year). No resets are permitted in the 10 years prior to the final "contract" maturity date.
(d) In-The-Money Surrender (GMSB_10 only)	Whenever the benefit is payable (i.e., 10 years after issue or last reset) and the AV/GV ratio is less 85%.

Notes on Factor Development

- The GMDB roll-up is compounded (not simple interest, not stepped at each anniversary) and is applied to the previous roll-up guaranteed value.

- The "Base Policy Lapse Rate" is the rate of policy termination (surrenders). Policy terminations (surrenders) are assumed to occur throughout the policy year (not only on anniversaries).

- Partial withdrawals are assumed to occur at the end of each time period (quarterly).

- Account charges ("MER") represent the total amount (annualized, in basis points) assessed against policyholder funds (e.g., sum of investment management fees, mortality and expense charges, risk premiums, policy/administrative fees, etc.). They are assumed to occur throughout the policy year (not only on anniversaries).

- For the GMDB_10 and GMMB_10 products, the contract rolls over (renews) at the end of each 10-year term for another 10 years. The guaranteed benefit resets to Z% of MV (after payment of any top-up maturity benefit for in-the-money maturity guarantees) where Z is typically 75 or 100.

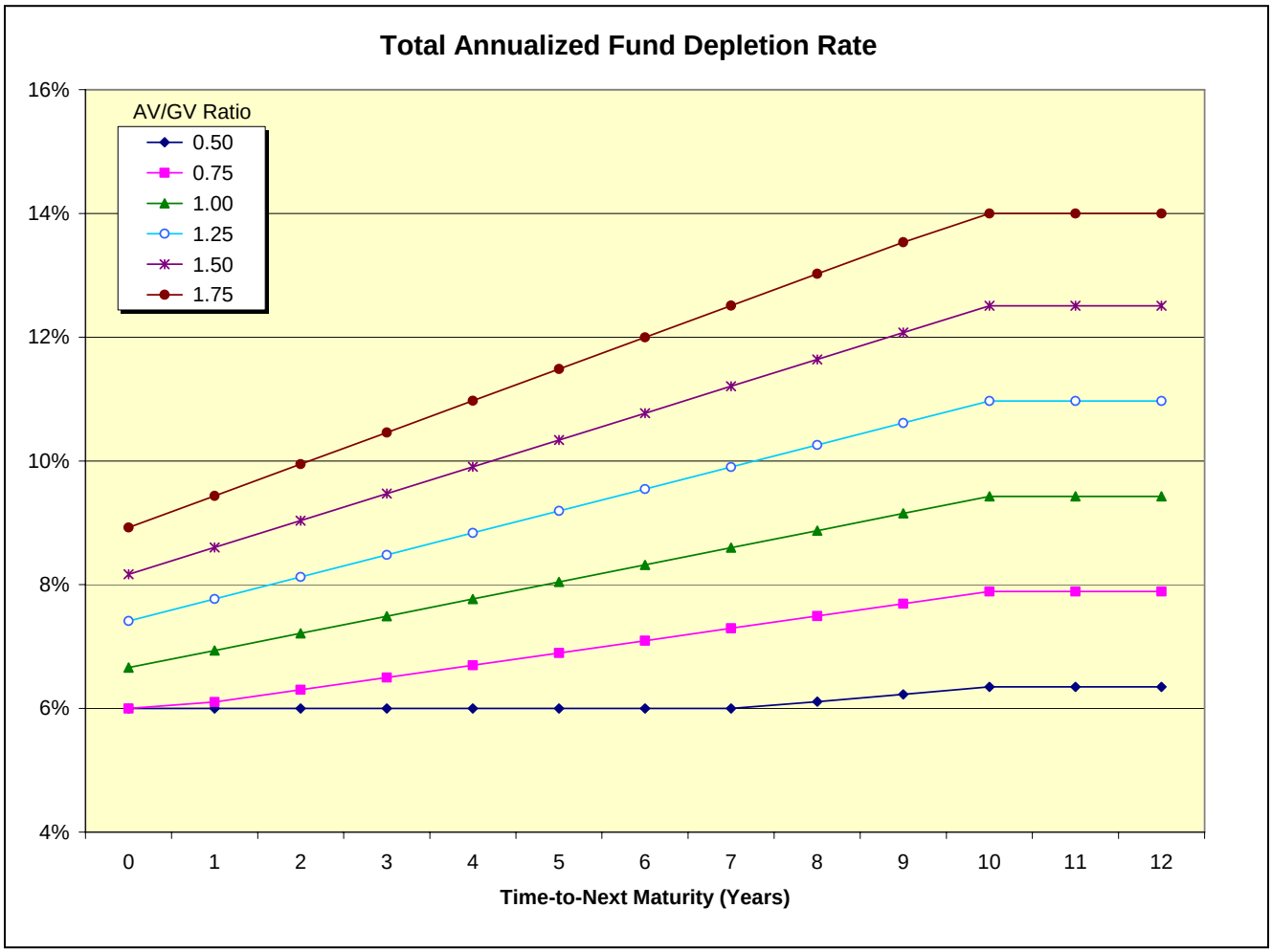
- The guaranteed minimum surrender benefit (GMSB_10) comes into effect 10 years after contract issue. If the guaranteed value at 10 years is greater than the account value at surrender, a "top-up" benefit equal to the difference is paid.

Table 2: Account-Based Fund Charges (bps per annum)

Asset Class / Fund	Account Value Charges (MER)
Money Market	110
Fixed Income (Bond)	200
Balanced	250
Low Volatility Equity	265
Diversified Equity	265
Intermediate Risk Equity	280
Aggressive or Exotic Equity	295

The annualized total fund depletion rates (i.e., including the fixed 4% per annum partial withdrawal) are illustrated in Figure 1 for various AV/GV ratios and times to maturity.

Figure 1: Fund Depletion Rates (Lapse + Partial Withdrawal) by AV/GV Ratio & Time-to-Maturity



Classifying the Asset Exposure

The following criteria should be used to select the appropriate factors, parameters and formulas for the exposure represented by a specified guaranteed benefit. When available, the volatility of the long-term annualized total return for the fund(s) – or an appropriate benchmark – should conform to the limits presented. For this purpose, "long-term" is defined as twice the average projection period that would be applied to test the product in a stochastic model (generally, at least 25 years).

Where data for the fund or benchmark are too sparse or unreliable, the fund exposure should be moved to the next higher volatility class than otherwise indicated. In reviewing the asset classifications, care should be taken to reflect any additional volatility of returns added by the presence of currency risk, liquidity (bid-ask) effects, short selling and speculative positions.

All exposures/funds must be categorized into one of the following seven (7) asset classes:

1. Money Market/Short-Term
2. Fixed Income
3. Balanced
4. Low Volatility Equity
5. Broad-Based Diversified Equity
6. Intermediate Risk Equity
7. Aggressive or Exotic Equity

Money Market/Short-Term. The fund is invested in money market instruments with an average remaining term-to-maturity of less than 365 days.

Fixed Income. The fund is invested primarily in investment grade fixed income securities. Up to 25% of the fund within this class may be invested in diversified equities or high-yield bonds. The expected volatility of the fund returns will be lower than the Balanced fund class.

Balanced. This class is a combination of fixed income securities with a larger equity component. The fixed income component should exceed 25% of the portfolio. Additionally, any aggressive or 'specialized' equity component should not exceed one-third (33.3%) of the total equities held. Should the fund violate either of these constraints, it should be categorized as an equity fund. These funds usually have a long-term volatility in the range of 8% – 13%.

Low Volatility Equity. This fund is comparable to the Broad-Based Diversified Equity class with the additional attributes noted below. Only funds that otherwise would be classified as Broad-Based Diversified Equity are candidates for this fund classification. For foreign funds, volatility should take into account the impact of currency fluctuations.

The expected volatility of the fund should be less than 15.5% (annualized) and the aggressive/exotic equity component of the equity holdings should be less than 33.3% of the total equities by market value. Further, the overall asset holdings should satisfy at least one of the following conditions:

- The fund permanently maintains a relatively large cash or fixed income position (greater than 10% of the market value of assets) as part of its investment strategy;
- The fund is "income" oriented and contains a significant (greater than 10% of the market value of assets) proportion of stocks paying material and regular dividends that are automatically reinvested in the fund.

***Broad-Based Diversified Equity*.** The fund is invested in a well-diversified mix of Canadian, U.S. or global equities. The foreign equity component must be comprised of liquid securities in well-developed markets. Funds in this category would exhibit long-term volatility comparable to that of the TSX. These funds should usually have a long-term volatility in the range of 13% – 19%.

***Intermediate Risk Equity*.** The fund has a mix of characteristics from both the Diversified and Aggressive Equity Classes. These funds have a long-term volatility in the range of 19% – 25%.

***Aggressive or Exotic Equity*.** This class comprises more volatile funds where risk can arise from: (a) underdeveloped markets, (b) uncertain markets, (c) high volatility of returns, (d) narrow focus (e.g., specific market sector), etc. The fund (or market benchmark) either does not have sufficient history to allow for the calculation of a long-term expected volatility, or the volatility is very high. This class would be used whenever the long-term expected annualized volatility is indeterminable or exceeds 25%.

Selecting Appropriate Investment Classes

The selection of an appropriate investment type should be done at the level for which the guarantee applies. For guarantees applying on a deposit-by-deposit basis, the fund selection is straightforward. However, where the guarantee applies across deposits or for an entire contract, the approach can be more complicated. In such instances, the approach is to identify for each policy where the "grouped holdings" fit within the categories listed and to classify the associated assets on this basis.

A seriatim process is used to identify the "grouped" fund holdings, to assess the risk profile of the current fund holdings (possibly calculating the expected long-term volatility of the funds held with reference to the indicated market proxies), and to classify the entire 'asset exposure' into one of the specified choices. Here, 'asset exposure' refers to the underlying assets (segregated and/or general account investment options) on which the guarantee will be determined. For

example, if the guarantee applies separately for each deposit year within the contract, then the classification process would be applied separately for the exposure of each deposit year.

In summary, mapping the benefit exposure (i.e., the asset exposure that applies to the calculation of the guaranteed minimum benefits) to one of the prescribed asset classes is a multi-step process:

1. Map each separate and/or general account investment option to one of the prescribed asset classes. For some funds, this mapping will be obvious, but for others it will involve a review of the fund's investment policy, performance benchmarks, composition and expected long-term volatility.

2. Combine the mapped exposure to determine the expected long-term volatility of current fund holdings. This will require a calculation based on the expected long-term volatilities for each fund and the correlations between the prescribed asset classes as given in Table 3.

3. Evaluate the asset composition and expected volatility (as calculated in step 2) of current holdings to determine the single asset class that best represents the exposure, with due consideration to the constraints and guidelines presented earlier in this section.

In step 1, the company should use the fund's actual experience (i.e., historical performance, inclusive of reinvestment) only as a guide in determining the expected long-term volatility. Due to limited data and changes in investment objectives, style and/or management (e.g., fund mergers, revised investment policy, different fund managers, etc.), the company may need to give more weight to the expected long-term volatility of the fund's benchmarks. In general, the company should exercise caution and not be overly optimistic in assuming that future returns will consistently be less volatile than the underlying markets.

In step 2, the company should calculate the "volatility of current fund holdings" (σ for the exposure being categorized) by the following formula using the volatilities and correlations in Table 3.

$$\sigma = \sqrt{\sum_{i=1}^{n}\sum_{j=1}^{n} w_i w_j \rho_{ij} \sigma_i \sigma_j}$$

where $w_i = \dfrac{AV_i}{\sum_k AV_k}$ is the relative value of fund *i* expressed as a proportion of total contract value, ρ_{ij} is the correlation between asset classes *i* and *j* and σ_i is the volatility of asset class *i* (see Table 3). An example is provided in Table 4.

Table 3: Volatilities and Correlations for Prescribed Asset Classes

ANNUAL VOLATILITY		GENERAL ACCOUNT	MONEY MARKET	FIXED INCOME	BALANCED	LOW VOL EQUITY	DIVERSE EQUITY	INTERM EQUITY	AGGR EQUITY
1%	GENERAL ACCOUNT	**1**	0.50	0.15	0	0	0	0	0
1%	MONEY MARKET	0.50	**1**	0.20	0	0	0	0	0
6%	FIXED INCOME	0.15	0.20	**1**	0.50	0.25	0.25	0.20	0.10
11%	BALANCED	0	0	0.50	**1**	0.80	0.95	0.75	0.65
15%	LOW VOL EQUITY	0	0	0.25	0.80	**1**	0.80	0.75	0.65
17%	DIVERSE EQUITY	0	0	0.25	0.95	0.80	**1**	0.75	0.65
22%	INTERM EQUITY	0	0	0.20	0.75	0.75	0.75	**1**	0.70
26%	AGGR EQUITY	0	0	0.10	0.65	0.65	0.65	0.70	**1**

As an example, suppose three funds (Fixed Income, Diversified Equity and Aggressive Equity) are offered to clients on a product with a contract level guarantee (i.e., across all funds held within the policy). The current fund holdings (in dollars) for five sample contracts are shown in Table 4.

Table 4: Fund Categorization Example

	1	**2**	**3**	**4**	**5**
MV Fund X (Fixed Income):	5,000	6,000	8,000	-	5,000
MV Fund Y (Diversified Equity):	9,000	5,000	2,000	5,000	-
MV Fund Z (Aggressive Equity):	1,000	4,000	-	5,000	5,000
Total Market Value:	$15,000	$15,000	$10,000	$10,000	$10,000
Total Equity Market Value:	$10,000	$9,000	$2,000	$10,000	$5,000
Fixed Income % (*A*):	33%	40%	80%	0%	50%
Fixed Income Test (*A*>75%):	No	No	Yes	No	No
Aggressive % of Equity (B):	10%	44%	n/a	50%	100%
Balanced Test (*A*>25% & *B*<33.3%):	Yes	No	n/a	No	No
Volatility of Current Fund Holdings:	12.0%	12.1%	6.5%	19.6%	13.6%
Fund Classification:	**Balanced**	**Diversified***	**Fixed Income**	**Intermediate**	**Diversified**

* *Although the volatility suggests "Balanced Fund", the Balanced Fund criteria were not met. Therefore, this 'exposure' is moved "up" to Diversified Equity. For those funds classified as Diversified Equity, additional analysis would be required to assess whether they can be reclassified as "Low Volatility Equity". In the examples above, none qualify.*

The "Volatility of Fund Holdings" for policy #1 is calculated as $\sqrt{A+B} = 12.04\%$ where:

$$A = \left(\frac{5}{15}\times 0.06\right)^2 + \left(\frac{9}{15}\times 0.17\right)^2 + \left(\frac{1}{15}\times 0.26\right)^2$$
$$= 1.1104\%$$
$$B = 2\cdot\left(\frac{5}{15}\cdot\frac{9}{15}\right)(0.25\times 0.06\times 0.17) + 2\cdot\left(\frac{5}{15}\cdot\frac{1}{15}\right)(0.10\times 0.06\times 0.26) + 2\cdot\left(\frac{9}{15}\cdot\frac{1}{15}\right)(0.65\times 0.17\times 0.26)$$
$$= 0.3388\%$$

Importantly, the volatility would be understated if we assumed zero correlation (e.g., all market returns are independent) since *B* contributes materially to the final value.

Determining the Risk Attributes

The 'Tabular' approach for the *TGCR* component creates a multi-dimensional grid (array) by testing a very large number of combinations for the policy attributes. The results are expressed as factors. The *TGCR* is calculated by looking into (based on a "key") the large, pre-computed multi-dimensional tables and using multi-dimensional linear interpolation. The lookup "key" depends on the risk attributes for the policy $\tilde{\theta} = (P, G, A, F, X, M, T, \phi, \Delta, R, S)$ where ϕ is the AV/GV ratio for the benefit exposure under consideration, Δ is the "MER Delta", R is the utilization rate of the elective reset option (if applicable) and S is the "in-the-money" termination rate on GMSB_10 policies. The "MER Delta" is calculated based on the difference between the actual MER and that assumed in the factor testing (see Table 2), subject to a cap (floor) of 100 bps (–100 bps). See Table 5 for more details.

For GMDB, there are $4 \times 2 \times 2 \times 7 \times 4 \times 4 \times 5 \times 7 \times 3 \times 2 = 376{,}320$ "nodes" in the "Basic Factor" grid. Interpolation will only be permitted across the six (6) dimensions: Contract Maturity Age (M), Attained Age (X), Time to Next Maturity (T), AV/GV Ratio (ϕ), MER Delta (Δ) and Reset Utilization Rate (R). The "In-the-Money" termination rate (S) is not used for GMDBs.

For GMMB, there are $3 \times 2 \times 2 \times 7 \times 1 \times 7 \times 5 \times 7 \times 3 \times 2 \times 2 = 246{,}960$ "nodes" in the "Basic Factor" grid. Interpolation will only be permitted across the six (6) dimensions: Contract Maturity Age (M), Time to Next Maturity (T), AV/GV Ratio (ϕ), MER Delta (Δ), Reset Utilization Rate (R) and In-the-Money Termination Rate (S). The "In-the-Money" termination rate (S) is only applies to the "GMSB_10" product form. The testing for guaranteed minimum maturity and surrender benefits assumed all lives were attained age 55 at the calculation date.

Functions are available to assist the company in applying the *TGCR* Methodology. More fully described in Section 9-6, these functions perform the necessary factor table lookups and associated multi-dimensional linear interpolations. If the insurer is unable to use the supplied functions, it will be required to develop its own. In such a case, the insurer should contact OSFI for specific details.

The GMDB and GMMB/GMSB factors are respectively contained in the files "GMDBFactors_CTE95.csv" and "GMMBFactors_CTE95.csv". These are comma-separated value text files where each "row" represents the factors for a test policy as identified by its lookup key. Rows are terminated by new line and line feed characters. Factors are also provided at the CTE80 confidence level – the factor files are "GMDBFactors_CTE80.csv" and "GMMBFactors_CTE80.csv". For the determination of capital requirements, the "GMDBFactors_CTE95.csv" and "GMMBFactors_CTE95.csv" factors are to be used.

Each row in the factor tables consists of three entries, described further below.

1	2	3
Test Case Identifier (Key)	Basic Cost or Diversification Factor	Basic Margin Offset Factor or Zero (N/A)

An individual test case (i.e., a node on the multi-dimensional matrix of factors) can be uniquely identified by its key, which is the concatenation of the relevant individual policy attribute keys (or some subset thereof) prefixed by a leading 'factor code'. The factor codes are shown below.

Factor Code	Description
1	Basic GMDB "Cost" and "Margin Offset" factors.
2	Basic GMMB and GMSB "Cost" and "Margin Offset" factors.
3	Asset Mix Diversification factors for GMDB options.
4	Asset Mix Diversification factors for GMMB and GMSB options.
5	Time Diversification factors for GMDB options.
6	Time Diversification factors for GMMB and GMSB options.

Basic Cost Factor. This is the term $f(\circ)$ in the formula for *TGCR*. The values in the factor grid represent CTE95 (or CTE80) of the sample distribution[28] for the present value of guaranteed minimum benefit cash flows (in excess of account value) in all future years (i.e., to the earlier of contract maturity and 30 years), normalized by current guaranteed value.[29] The policy attribute keys for the Cost factors are shown in Table 5.

Basic Margin Offset Factor. This is the term $g(\circ)$ in the formula for *TGCR*. The values in the factor grid represent CTE95 (or CTE80) of the sample distribution for the present value of margin offset cash flows in all future years (i.e., to the earlier of contract maturity and 30 years), normalized by current account balance. The Basic Margin Offset Factors assume $\hat{\alpha} = 100$ basis points of "margin offset" (net spread available to fund the guaranteed benefits). The policy attribute keys for the Margin Offset factors are shown in Table 5.

Asset Mix Diversification Factor. This is the term $h(\circ)$ in the formula for *TGCR*. $h(\circ) = h(P, G, R, S)$ is an adjustment factor that reflects the benefits of fund diversification (asset mix) at the company (i.e., total portfolio) level. Note that $h(\circ) \le 1$ depends on product form "*P*",

[28] Technically, the sample distribution for "present value of net cost" = PV[benefit claims] – PV[Margin Offset] was used to determine the scenario results that comprise the CTE95 risk measure. Hence, the "Cost Factors" and "Base Margin Offset Factors" are calculated from the same scenarios.

[29] In other words, the *Basic Cost Factors* are expressed "per $1 of current guaranteed benefit" and the *Margin Offset Factors* are "per $1 of account balance", assuming 100 basis points (per annum) of available spread.

guarantee level "*G*", reset utilization rate "*R*" (where applicable) and in-the-money termination rate "*S*" (GMSB only). The lookup keys for the Asset Mix Diversification factors are given in Table 6.

DF should be set equal to 1 in the `GetCost and GetTGCR` functions (see Section 9-6-2).

Time Diversification Factor. This is the term $w(\circ)$ in the formula for *TGCR*. $w(\circ) = w(P,G,F,R,S)$ is an adjustment factor that attempts to capture the benefits (i.e., net reduction in guaranteed benefit costs) of a dispersed maturity profile. This adjustment applies on to maturity benefit factors only; it does not apply to death benefit factors. Note that $w(\circ) \le 1$ also depends on fund class "*F*". If the company does not satisfy the time diversification criteria, then $w(\circ) = 1$ (i.e., no time diversification benefit). Although the structure permits otherwise, the time diversification factors for GMDB are set to 1. The lookup keys for the Time Diversification factors are given in Table 7.

This factor is set either to zero or one, based on the results of a time diversification test.

To perform the test, the in-force maturity dates for each product/maturity guarantee form are grouped by "quarter-to-maturity" (i.e., 1, 2, …, *N*). For limited-term contracts that offer the client the opportunity to renew ("rollover"), the next maturity date should be used (not final contract maturity). Using current market value (at the calculation date), the current market value in each future 3-month time period is determined.

If the current market value in any given quarter exceeds 10% of the total, then the portfolio fails the test. If the current market value in each quarter is less than or equal to 10% of the total, the portfolio passes the test. If the portfolio fails the test, *DT* is set equal to zero in the `GetCost and GetTGCR` functions (see Section 9-6-2). Otherwise, *DT* is set equal to one.

Table 5: Grid of Cost and Margin Offset Factors

Policy Attribute		Key : Possible Values & Description
Product Definitions, *P*.	**GMDB**	0 : Return-of-premium. 1 : Roll-up (5% per annum). 2 : Maximum Anniversary Value (MAV). 3 : 10-year rollover.
	GMMB & GMSB	0 : Fixed maturity date. 1 : 10-year CSV (benefit paid on surrender) 2 : *Not used*. 3 : 10-year rollover.
Guarantee Level (% of deposits), *G*.		0 : 75% 1 : 100%
GV Adjustment Upon Partial Withdrawal, *A*.		0 : Pro-rata by market value. 1 : Dollar-for-dollar.
Fund Class, *F*.		0 : *Not used*. 1 : Money Market. 2 : Fixed Income (Bond). 3 : Balanced Asset Allocation. 4 : Low Volatility Equity. 5 : Diversified Equity. 6 : Intermediate Risk Equity. 7 : Aggressive / Exotic Equity.
Contract Maturity Age, *M*. (years from valuation date)	**GMDB**	0 : 5 years 1 : 15 years 2 : 25 years 3 : 30 years
	GMMB & GMSB	0 : 1 year 4 : 10 years 1 : 3 years 5 : 20 years 2 : 5 years 6 : 30 years 3 : 8 years
Attained Age (Last Birthday), *X*.	**GMDB**	0 : 35 2 : 65 1 : 55 3 : 75
	GMMB & GMSB	0 : 55
Time to Next Maturity, *T*. (years from valuation date)		0 : 1 year 3 : 8 years 1 : 3 years 4 : 10+ years 2 : 5 years
Account Value-to-Guaranteed Value Ratio, ϕ.		0 : 0.25 4 : 1.25 1 : 0.50 5 : 1.50 2 : 0.75 6 : 2.00 3 : 1.00
Annualized Account Charge Differential from Table 2 Assumptions ("MER Delta"), Δ		0 : –100 bps 1 : 0 bps 2 : +100 bps
Reset Utilization Rate, *R*.		0 : 0% 1 : 100%
In-the-Money Surrender Rate (GMSB only), *S*.		0 : 0% 1 : 100%

It is important to note that the lookup keys for the factor tables define certain values differently from the parameters (arguments) passed to the lookup/retrieval functions, as indicated in the following table. More details are provided in Section 9-6.

Policy Attribute	Key Interpretation	Function Arguments
Contract Maturity Age, M.	Years from Valuation Date. Equal to [Contract Maturity Age] less [Attained Age].	Actual contract maturity age.
AV/GV Ratio, ϕ.	Ratio of current Account Balance (AV) to Guaranteed Value (GV).	AV and GV are provided separately.
MER Delta, Δ.	[Actual MER] less [Assumed MER], in basis points. The "Assumed MERs" are shown in Table 2.	MER (annualized, in basis points p.a.) is passed directly.

Table 6: Grid of Asset Mix Diversification Factors

Policy Attribute		Key : Possible Values & Description
Product Definitions, *P*.	**GMDB**	0 : Return-of-premium. 1 : Roll-up (5% per annum). 2 : Maximum Anniversary Value (MAV). 3 : 10-year rollover.
	GMMB & GMSB	0 : Fixed maturity date. 1 : 10-year CSV (benefit paid on surrender). 2 : *Not used*. 3 : 10-year rollover.
Guarantee Level (% of deposits), *G*.		0 : 75% 1 : 100%
Reset Utilization Rate, *R*.		0 : 0% 1 : 100%
In-the-Money Surrender Rate (GMSB only), *S*.		0 : 0% 1 : 100%

Table 7: Grid of Time Diversification Factors

Policy Attribute		Key : Possible Values & Description
Product Definition, *P*.	**GMDB**	0 : Return-of-premium. 1 : Roll-up (5% per annum). 2 : Maximum Anniversary Value (MAV). 3 : 10-year rollover.
	GMMB & GMSB	0 : Fixed maturity date. 1 : 10-year CSV (benefit paid on surrender). 2 : *Not used*. 3 : 10-year rollover.
Guarantee Level (% of deposits), *G*.		0 : 75% 1 : 100%
Fund Class, *F*.		0 : *Not used*. 1 : Money Market. 2 : Fixed Income (Bond). 3 : Balanced Asset Allocation. 4 : Low Volatility Equity. 5 : Diversified Equity. 6 : Intermediate Risk Equity. 7 : Aggressive / Exotic Equity.
Reset Utilization Rate, *R*.		0 : 0% 1 : 100%
In-the-Money Surrender Rate (GMSB only), *S*.		0 : 0% 1 : 100%

Retrieving the Appropriate Nodes

Table 8 provides some sample lookup keys (assuming the annualized fund based charges equal the base assumption, hence $\Delta = 0$), while Table 9 shows the "Basic Cost" and "Basic Margin Offset" values from the factor grid for some sample GMDB and GMMB policies. All sample policies in Table 9 use a 100% guarantee level, base MERs and no resets. As mentioned earlier, the Base Margin Offset factors (in the tables) assume 100 basis points of "available spread". The "Margin Offset Factors" are therefore scaled by the ratio $\frac{\alpha}{100}$, where α = the actual margin offset (in basis points per annum) for the policy being valued. Hence, the margin factor for the 7th policy is exactly half the factor for node '11105214210' (the 4th sample policy in Table 9). That is, 0.02093 = 0.5 × 0.04187.

Where more than one feature (i.e., guaranteed benefit) is present in a product, unless the company has a justifiable alternative for allocating the total available spread between the benefit types (e.g., explicitly defined risk charges), the split should be based on the proportionate gross guaranteed benefit costs. An example of this allocation is provided in Sections 9-6-6 to 9-6-9.

Table 8: Sample Lookup Keys

KEY	NODE TYPE	PRODUCT / GV%	GV ADJUST	FUND CLASS	ATT.. AGE / MAT. AGE	NEXT MAT.	AV/GV	RESET UTIL.%	ITM TERM%
10103214110	A	GMDB-ROP / 100%	Pro-rata	Balanced Allocation	65 / 80	10+	50%	0%	n/a
200150444110	A	GMMB-Fixed / 75%	$-for-$	Diverse Equity	55 / 75	5	125%	100%	n/a
3311	B	GMDB_10 / 100%	n/a	n/a	n/a	n/a	n/a	100%	n/a
43100	B	GMMB_10 / 100%	n/a	n/a	n/a	n/a	n/a	0%	n/a
611411	C	GMSB_10 / 100%	n/a	Low Vol. Equity	n/a	n/a	n/a	100%	100%

A = Basic Cost and Margin Offset Factors; B = Asset Mix Diversification Factors; C = Time Diversification Factors.

Table 9: Sample Nodes on the Basic Factor Grids

KEY	PRODUCT	GV ADJUST	FUND CLASS	ATT. AGE / MAT.AGE	NEXT MAT.	AV/GV	OFFSET	COST FACTOR	MARGIN FACTOR
10113124310	GMDB ROP	$-for-$	Balanced Allocation	55 / 80	10+	1.00	100	0.01802	0.05762
10113214310	GMDB ROP	$-for-$	Balanced Allocation	65 / 80	10+	1.00	100	0.03926	0.04747
10113302310	GMDB ROP	$-for-$	Balanced Allocation	75 / 80	5	1.00	100	0.04443	0.02653
11105214210	GMDB 5% Rollup	Pro-rata	Diverse Equity	65 / 80	10+	0.75	100	0.16780	0.04187
11105214310	GMDB 5% Rollup	Pro-rata	Diverse Equity	65 / 80	10+	1.00	100	0.13091	0.04066
11105214410	GMDB 5% Rollup	Pro-rata	Diverse Equity	65 / 80	10+	1.25	100	0.09925	0.03940
11105214210	GMDB 5% Rollup	Pro-rata	Diverse Equity	65 / 80	10+	0.75	50	0.16780	0.02093
231050513100	GMMB_10	Pro-rata	Diverse Equity	55 / 75	3	1.00	100	0.32250	0.05609
231050523100	GMMB_10	Pro-rata	Diverse Equity	55 / 75	5	1.00	100	0.25060	0.05505
231050533100	GMMB_10	Pro-rata	Diverse Equity	55 / 75	8	1.00	100	0.16758	0.05545

Use of Supplied Functions to Determine the Requirement

Special functions have been supplied in the file OSFIFactorCalc.dll (C++ dynamic linked library) to retrieve the "cost", "margin offset" and "diversification" factors from the factor files *and* perform the multi-dimensional linear interpolation. Cover functions in the Microsoft® Visual Basic "Add-In" are provided in the file OSFIFactorCalc.xla so that the C++ routines are callable from Microsoft Excel through VBA[30]. The function arguments are described in Table 10. Not all parameters apply to all functions (i.e., some are optional and/or not applicable). The keys for the input parameters are given in Table 5.

Installation instructions are given later in this section. A call to an Excel function (built-in or VBA) must be preceded by a "+" or "=" character.

Table 10: Input Parameters (Arguments) to Supplied Lookup/Retrieval Functions

Input Parameter – Variable Name	Variable Type	Description
B – BenefitType	Long Integer	Benefit Type code (1=GMDB, 2=GMMB/GMSB).
P – ProductCode	Long Integer	Product Definition code.
G – GuarCode	Long Integer	Guarantee Level code.
A – GVAdjustCode	Long Integer	GV Adjustment Upon Partial Withdrawal.
F – FundCode	Long Integer	Fund Class code.
M – FinalMatAge	Floating Point Double	Contract Maturity Age of annuitant (in years).
X – AttainedAge	Floating Point Double	Attained Age of annuitant (in years).
T – TimeToMat	Floating Point Double	Time to Next Maturity Date (in years).
MVGV – MVGV	Floating Point Double	Ratio of Account Balance to Guaranteed Value (AV/GV).
MER – MER	Floating Point Double	Total Equivalent Account Charges (annualized, in bps).
R – ResetUtil	Floating Point Double	Reset Utilization Rate (from 0 to 1).
S – SurrenderUtil	Floating Point Double	In-The-Money Termination Rate (from 0 to 1).
RC – RiskCharge	Floating Point Double	Margin Offset (annualized, in basis points).
AV – AccountValue	Floating Point Double	Current Account Balance, in dollars.
GV – GuarValue	Floating Point Double	Current Guaranteed Value, in dollars.
DF – FundDivAdj	Floating Point Double	The fraction of the Asset Mix Diversification adjustment reflected in the Adjusted Cost Factor (from 0 to 1).
DT – TimeDivAdj	Floating Point Double	The fraction of the Time Diversification adjustment reflected in the Adjusted Cost Factor (from 0 to 1).

[30] Visual Basic for Applications.

See Section 9-4-3 for instructions on setting the parameters for DF and DT.

Using the notation given earlier,

$$TGCR = GV \times h(\circ) \times w(\circ) \times [BasicCostFactor] - \frac{\alpha}{100} \times AV \times [BasicMarginFactor]$$
$$= GV \times h(\circ) \times w(\circ) \times f(\tilde{\theta}) - \frac{\alpha}{100} \times AV \times g(\tilde{\theta})$$
$$= GV \times \hat{f}(\tilde{\theta}) - AV \times \hat{g}(\tilde{\theta})$$
$$= \hat{F}(\tilde{\theta}) - \hat{G}(\tilde{\theta})$$

The VBA functions are:

`GetCost`(B, P, G, A, F, M, X, T, AV, GV, MER, R, S, RC, DF, DT)

– Returns the *Adjusted Dollar Cost* $\hat{F}(\tilde{\theta})$, interpolating between nodes where necessary. S and RC are required arguments, but RC is ignored in the calculations (i.e., the margin offset does not affect the "cost" component). Also, S is ignored for GMDB calculations (i.e., S = 0 if B = 1). DF and DT are optional, but assumed to be zero if not supplied.

`GetMargin`(B, P, G, A, F, M, X, T, AV, GV, MER, R, S, RC, DF, DT)

– Returns the *Adjusted Dollar Margin Offset* $\hat{G}(\tilde{\theta})$, interpolating between nodes where necessary. S is required, but ignored for GMDB calculations (i.e., S = 0 if B = 1). DF and DT are optional, but ignored regardless (i.e., the diversification factors only apply to the "cost" component).

`GetTGCR`(B, P, G, A, F, M, X, T, AV, GV, MER, R, S, RC, DF, DT)

– Returns the *Adjusted Dollar TGCR* $= \hat{F}(\tilde{\theta}) - \hat{G}(\tilde{\theta})$, interpolating between nodes where necessary. S is required, but ignored for GMDB calculations (i.e., S = 0 if B = 1). DF and DT are optional, but assumed to be zero if not supplied.

To retrieve the *Basic Cost Factor* $f(\tilde{\theta})$, simply use the function `GetCost` with AV = AV/GV, GV = 1 and DF = DT = 0. Similarly, the *Basic Margin Factor* $g(\tilde{\theta})$ may be obtained by calling `GetMargin` with GV = GV/AV, AV = 1 and RC = 100.

For reference, the underlying C++ routines are listed below. These tools are also available as VBA functions where the name is prefixed with an "x" (e.g., `xGetGMDBCostFactor`).

`GetGMDBCostFactor`(P, G, A, F, M, X, T, MVGV, MER, R)

– Returns the GMDB *Basic Cost Factor* $f(\tilde{\theta})$, interpolating between nodes where necessary.

`GetGMDBMarginFactor`(P, G, A, F, M, X, T, MVGV, MER, R, RC)

– Returns the GMDB *Scaled Margin Offset Factor* $\hat{g}\left(\tilde{\theta}\right)$, interpolating between nodes where necessary. In this case, the Basic (i.e., tabular) Margin Offset Factor has already been scaled by the ratio $\frac{\alpha}{100}$ to account for the actual available spread. To extract the tabular factor $g\left(\tilde{\theta}\right)$, use RC = 100.

`GetGMDBFundDiversification`(P, G, R)

– Returns the GMDB *Asset Mix Diversification Factor* $h\left(\tilde{\theta}\right)$, interpolating between nodes where necessary.

`GetGMDBTimeDiversification`(P, G, F, R)

– Returns the GMDB *Time Diversification Factor* $w\left(\tilde{\theta}\right)$, interpolating between nodes where necessary. Currently, $w\left(\tilde{\theta}\right)=1$ for all nodes, so this function call is unnecessary for GMDB.

`GetGMMBCostFactor`(P, G, A, F, M, X, T, MVGV, MER, R, S)

– Returns the GMMB/GMSB *Basic Cost Factor* $f\left(\tilde{\theta}\right)$, interpolating between nodes where necessary.

`GetGMMBMarginFactor`(P, G, A, F, M, X, T, MVGV, MER, R, S, RC)

– Returns the GMMB/GMSB *Scaled Margin Offset Factor* $\hat{g}\left(\tilde{\theta}\right)$, interpolating between nodes where necessary. In this case, the Basic (i.e., tabular) Margin Offset Factor has already been scaled by the ratio $\frac{\alpha}{100}$ to account for the actual available spread. To extract the tabular factor $g\left(\tilde{\theta}\right)$, use RC = 100.

`GetGMMBFundDiversification`(P, G, R, S)

– Returns the GMMB/GMSB *Asset Mix Diversification Factor* $h\left(\tilde{\theta}\right)$, interpolating between nodes where necessary.

`GetGMMBTimeDiversification`(P, G, F, R, S)

– Returns the GMMB/GMSB *Time Diversification Factor* $w\left(\tilde{\theta}\right)$, interpolating between nodes where necessary.

Installing and Using the OSFI Factor Calculation Routines

The files shown in Table 11 comprise the "OSFI Factor Calculation" tools, supplied by OSFI to assist the company in calculating the *TGCR* for GMDB, GMMB and GMSB options.

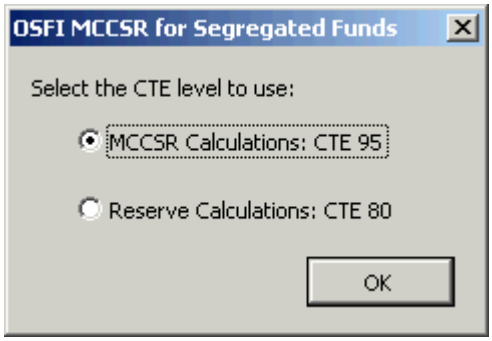
Table 11: OSFI Factor Calculation Tools – Required Files

File Name	Description
Setup.exe	Windows® setup program to unzip and install the calculation tools.
OSFIFactorCalc.xla	Microsoft® Excel Visual Basic Add-In. This functionality 'wraps' the C++ routines, allowing them to be called directly from Microsoft Excel workbooks (i.e., can be invoked the same way as built-in Excel functions).
OSFIFactorCalc.dll	The C++ dynamic linked library that contains the lookup and interpolation functions as described in this section.
GMDBFactors_CTE95.csv GMMBFactors_CTE95.csv	Comma separated value (flat text) files containing the factors and parameters described in Section 9-4. Each "row" in the file corresponds to a test policy as identified by the lookup keys shown in Table 5. Each row consists of three entries and is terminated by new line and line feed characters. See Section 9-4 for more details. Files are also provided at the CTE80 confidence level.

To install the OSFI factor calculation routines, run the setup utility and follow the instructions. This will unzip (decompress) the files and register the DLL in the Windows program registry.

The Microsoft Add-In must be loaded (into Excel) before the VBA functions can be called. The factor files and the Microsoft Excel Add-In (*.xla) must reside in the same folder. Simply open "OSFIFactorCalc.xla" from Microsoft Excel. To view the VBA program, press [Alt-F11].

The following dialog should appear when the Add-In "OSFIFactorCalc.xla" is loaded, prompting the user to select the appropriate CTE confidence level for calculation (either CTE95 or CTE80). This controls which factor tables are read into memory. For a given workbook, only a single set of factor files can be accessed (i.e., either CTE80 *or* CTE95).



Calculation Example

Suppose we have the policy/product parameters as specified in Table 12. Further assume that the portfolio satisfies the criteria in order to apply the "Time Diversification" factors.

Table 12: Results for 10-year GMMB with Elective Resets, Level ROP GMDB without Resets

a) Parameter / Attribute	Value	Description and/or Notes
Account Value (AV)	$90.00	Total account value at valuation date, in dollars.
Original Deposit	$100.00	Original deposit, in dollars.
GMDB (GV)	$100.00	Current guaranteed death maturity benefit, in dollars.
GMMB (GV)	$100.00	Current guaranteed minimum maturity benefit, in dollars.
Guarantee Level	100%	Initial guaranteed value as % of original deposit.
Gender	Female	Use 4-year age setback for X and M (GMDB only).
Actual Attained Age (X)	62	Attained age at the valuation date (in years).
Contract Maturity Age (M)	85	Contract maturity age (in years).
Time to Next Maturity (T), GMDB	23	Time to next maturity/rollover date (in years).
Time to Next Maturity (T), GMMB	3	Time to next maturity/rollover date (in years).
GV Adjustment	Pro-Rata	GV adjusted pro-rata by MV upon partial withdrawal.
Fund Class	Diversified Equity	Contract exposure mapped to Diversified Equity as per the Fund Categorization instructions in 9-3.
MER	265	Total charge against policyholder funds (bps).
GMDB Product Code (P)	0	Product Definition code as per lookup key in Table 5.
GMMB Product Code (P)	3	Product Definition code as per lookup key in Table 5.
Guarantee Level Code (G)	1	Guarantee Code as per key in Table 5.
GV Adjustment Code (A)	0	GV Adjustment Upon Partial Withdrawal as per Table 5.
Fund Code (F)	5	Fund Class code as per lookup key in Table 5.
GMMB Reset Utilization (R)	0.35	Reset utilization rate (from 0 to 1).
In-The-Money Termination (S)	0	In-the-money termination rate (from 0 to 1).
Total Allocated Spread (RC)	80	Total margin offset (bps p.a.) for GMDB & GMMB combined.
Asset Mix Diversification (DF)	1	Credit for asset mix diversification.
Time Diversification (DT)	1	Credit for time diversification (GMMB).

Using the notation from Section 9-6-2,

$$TGCR = GV \times h(\circ) \times w(\circ) \times [BasicCostFactor] - \frac{\alpha}{100} \times AV \times [BasicMarginFactor]$$
$$= GV \times h(\circ) \times w(\circ) \times f(\tilde{\theta}) - \frac{\alpha}{100} \times AV \times g(\tilde{\theta})$$
$$= GV \times \hat{f}(\tilde{\theta}) - AV \times \hat{g}(\tilde{\theta})$$
$$= \hat{F}(\tilde{\theta}) - \hat{G}(\tilde{\theta})$$

$\hat{f}_{GMDB}(\tilde{\theta})$ = `GetCost( 1, 0, 1, 0, 5, 81, 58, 23, 0.9, 1, 265, 0, 0, 80, 1, 1 )`

$= 0.04592$

$\hat{f}_{GMMB}(\tilde{\theta})$ = `GetCost( 2, 3, 1, 0, 5, 85, 62, 3, 0.9, 1, 265, 0.35, 0, 80, 1, 1 )`

$= 0.32849$

In the absence of specific and well-defined risk charges for each guaranteed benefit, we allocate the total spread by the claims cost and obtain (in bps per annum):

$\alpha_{GMDB} = \frac{0.04592}{(0.04592 + 0.32849)} \times 80 = 0.12264 \times 80 = 9.81$ basis points per annum available to fund the GMDB claims and $\alpha_{GMMB} = 80 - 9.81 = 70.19$ bps p.a. to fund GMMB payouts.

$\hat{F}_{GMDB}(\tilde{\theta})$ = `GetCost( 1, 0, 1, 0, 5, 81, 58, 23, 90, 100, 265, 0, 0, 9.81, 1, 1 )`

$= \$4.59 = 0.04592 \times \$100$

$$\hat{F}_{GMMB}\left(\tilde{\theta}\right) = \texttt{GetCost}(\ 2,\ 3,\ 1,\ 0,\ 5,\ 85,\ 62,\ 3,\ 90,\ 100,\ 265,\ 0.35,\ 0,\ 70.19,\ 1,\ 1\ )$$
$$= \$32.85 = 0.32849 \times \$100$$

For reference, the *Basic Cost Factors* (i.e., before diversification adjustments) are:

$$f_{GMDB}\left(\tilde{\theta}\right) = \texttt{GetCost}(\ 1,\ 0,\ 1,\ 0,\ 5,\ 81,\ 58,\ 23,\ 0.9,\ 1,\ 265,\ 0,\ 0,\ 9.81\ )$$
$$= 0.04794$$

$$f_{GMMB}\left(\tilde{\theta}\right) = \texttt{GetCost}(\ 2,\ 3,\ 1,\ 0,\ 5,\ 85,\ 62,\ 3,\ 0.9,\ 1,\ 265,\ 0.35,\ 0,\ 70.19\ )$$
$$= 0.36461$$

$$g_{GMDB}\left(\tilde{\theta}\right) = \texttt{GetMargin}(\ 1,\ 0,\ 1,\ 0,\ 5,\ 81,\ 58,\ 23,\ 0.9,\ 1,\ 265,\ 0,\ 0,\ 100\ )$$
$$= 0.04227 = 0.04697 \times 0.9$$

$$g_{GMMB}\left(\tilde{\theta}\right) = \texttt{GetMargin}(\ 2,\ 3,\ 1,\ 0,\ 5,\ 85,\ 62,\ 3,\ 0.9,\ 1,\ 265,\ 0.35,\ 0,\ 100\ )$$
$$= 0.06201 = 0.06890 \times 0.9$$

$$\hat{G}_{GMDB}\left(\tilde{\theta}\right) = \texttt{GetMargin}(\ 1,\ 0,\ 1,\ 0,\ 5,\ 81,\ 58,\ 23,\ 90,\ 100,\ 265,\ 0,\ 0,\ 9.81\ )$$
$$= \$0.41 = 0.04697 \times \$90 \times \left(\frac{9.81}{100}\right)$$

$$\hat{G}_{GMMB}\left(\tilde{\theta}\right) = \texttt{GetMargin}(\ 2,\ 3,\ 1,\ 0,\ 5,\ 85,\ 62,\ 3,\ 90,\ 100,\ 265,\ 0.35,\ 0,\ 70.19\ )$$
$$= \$4.35 = 0.06890 \times \$90 \times \left(\frac{70.19}{100}\right)$$

$TGCR_{GMDB}$ = `GetTGCR( 1, 0, 1, 0, 5, 81, 58, 23, 90, 100, 265, 0, 0, 9.81, 1, 1 )`

= \$4.18

= \$4.59 – \$0.41

$TGCR_{GMMB}$ = `GetTGCR( 2, 3, 1, 0, 5, 85, 62, 3, 90, 100, 265, 0.35, 0, 70.19, 1, 1 )`

= \$28.50

= \$32.85 – \$4.35

Finally, the *TGCR* for the policy is \$4.18 + \$28.50 = \$32.68

If desired, the Asset Mix and Time Diversification Factors may be obtained through additional function calls by setting DF or DT to zero as required and solving for the other factor. For example, if we set DF = 1 and DT = 0, we obtain for the GMMB component:

0.34307 = `GetCost( 2, 3, 1, 0, 5, 85, 62, 3, 0.9, 1, 265, 0.35, 0, 80, 1, 0 )`

However, with DF = 1 and DT = 1 we obtained $\hat{f}_{GMMB}\left(\tilde{\theta}\right) = 0.32849$ (see earlier in this section).

Hence, the GMMB *Time Diversification* Factor is equal to $0.9575 = \frac{0.32849}{0.34307}$.

Margin Offset Adjustment

The total equivalent account charge ("MER") is meant to capture *all* amounts that are deducted from policyholder funds, not only those that are commonly expressed as spread-based fees. The MER, expressed as an equivalent annual basis point charge against account value, should include (but not be limited to) the following: investment management fees, mortality & expense charges, administrative loads, policy fees and risk premiums. It may be necessary to estimate an equivalent MER if there are fees withdrawn from policyholder accounts that are not expressed as basis point charges against account value.

The margin offset, α, represents the total amount available to fund the guaranteed benefit claims and amortization of the unamortized surrender charge allowance after considering most other policy expenses (including overhead). The margin offset, expressed as an equivalent annual basis point charge against account value, should be deemed permanently available in all future scenarios. However, the margin offset should not include per policy charges (e.g., annual policy fees) since these are included in fixed expenses. It is often helpful to interpret the margin offset as $\alpha = MER - X$, where X is the sum of:

- Investment management expenses and advisory fees;
- Commissions, bonuses (dividends) and overrides;
- Maintenance expenses; and
- Amounts required to amortize unamortized acquisition costs (net of available surrender charges).

Credit for Reinsurance Ceded or Capital Markets Hedging

This is the reduction in the *TGCR* available on account of risk mitigation strategies, including reinsurance and hedging.

For registered reinsurance of segregated fund liabilities that is directly expressible in terms of the component factors, ceding companies may take credit through an appropriate reduction of the factors.

For more complex reinsurance arrangements that cannot be expressed using the factors, the impact will need to be modelled (refer to *Modelling and Calibration* in Section 9-9) and submitted to OSFI for approval. For example, a reinsurance treaty that has the ceding company retain losses to a predetermined level (a "deductible"), with the reinsurer assuming losses above this level, but with a cap on the reinsurance claims (e.g., a maximum annual payment cap under the treaty) would normally require the use of suitable valuation model.

Policy liabilities ceded to unregistered reinsurers, per Guideline B-3, must be reported on page 20.030, line 085 by Canadian companies, and on page 25.010, line 050 by foreign branches.

Deposits held for unregistered reinsurance per section 1-2, for the period not less than the fund guarantee term remaining which are in excess of the actuarial liabilities for the risk reinsured, may reduce the net required segregated fund risk component requirement on the reinsured policies to a minimum of zero (report this amount in column 04 on page 90.010). For Canadian business, the deposits must be held in Canada, and OSFI must have given the company permission to reduce its reserves by the deposits held corresponding to the reserves. The reduction is limited to that available had the business been ceded to a reinsurer subject to these requirements.

Institutions seeking to obtain credit for segregated funds for hedging programs should refer to OSFI Instruction Guide "*Capital Offset for Segregated Fund Hedging Programs (MCCSR)*" for instructions and requirements.

Custom Factors and Internal Models

Custom Factors

Should the company be evaluating a product type that is materially different from those presented in the tables, or where a company needs to evaluate a complex reinsurance or hedging arrangement, it will be necessary to use stochastic modelling to calculate factors for the particular product or treaty.

The use of modelling to calculate factors specific to a product requires approval by the Actuarial Division of OSFI. Life Insurers should contact OSFI's Actuarial or Capital Division for specific details.

Approved factors apply until new factors or an internal model are approved by OSFI.

With the passage of time, the assumptions underlying approved factors may not reflect emerging experience and can become inconsistent with the current valuation assumptions.

In such instances, an inconsistency between the TGCR calculated using the approved factors and that determined at CTE (95) using the company's stochastic model with current valuation assumptions might develop. The actuary should regularly review this relationship to ensure that the TGCR held using the approved factors is not materially less than that calculated at CTE (95) using the company's stochastic model with current valuation assumptions. *If the TGCR using the previously approved factors is materially less than the TGCR calculated at CTE (95) using the company's stochastic model with current valuation assumptions, the institution should use the higher TGCR and apply to OSFI for approval of new factors or make an application to use its internal model to calculate capital requirements.*

Internal Models

OSFI permits, subject to criteria, the use of internal models for the development of segregated fund capital requirements. Institutions seeking to use their internal models must follow the requirements outlined in OSFI's *Instruction Guide on Use of Internal Models for Determining Required Capital for Segregated Fund Risks (MCCSR)*. Internal model usage requires OSFI's prior written approval and is subject to materiality considerations. The requirements also include transitional rules: in the first year of approval, only 50% credit is permitted (i.e., the Total Gross Calculated Requirement is equal to 50% of the value calculated under the approved internal model plus 50% of the value calculated using the factor requirements). However, in subsequent years, the requirement is based 100% upon the value determined by the approved internal model.

Analysis of Results

The development of capital requirement factor grids using stochastic methods is a complex process. While the work done in developing the factors was extensive, there is still the possibility that the factors may contain anomalies.

Many insurers use their own stochastic models to determine liability requirements. An insurer that uses a stochastic model that has not been approved should regularly compare the present value of net costs at CTE(95) that is output by its model with OSFI's capital requirements based on the application of the factor grid. Insurers should report to OSFI any unusual results that appear to be caused by logical or methodological errors within the capital requirements.