



# Guideline

**Subject: Capital Adequacy Requirements**

**No: A - Part I**

**Date: January 2001**

Canadian banks and federally regulated trust and loan companies are required to meet capital adequacy standards prescribed by the Superintendent of Financial Institutions. For this purpose, the Superintendent has established two minimum standards: assets to capital multiple, and risk-based capital ratio. The first test provides an overall measure of the adequacy of an institution's capital. The second measure focuses on the credit risk of the specific on- and off-balance sheet asset categories. This guideline outlines these frameworks. It encompasses the international standards agreed upon in July 1988 at the Bank for International Settlements. The 1996 amendment to the 1988 Capital Accord that sets out a framework for calculating the capital requirements for market risk is covered in Guideline A - Part II, Capital Adequacy Requirements - Market Risk.

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**Overview**

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## Overview

Outlined below is an overview of the capital adequacy requirements for federally regulated deposit-taking institutions (DTIs). In this guideline, 'federally regulated deposit-taking institutions' means banks and all federally regulated trust and loan companies. More detailed information on specific components of the calculations is contained under subsequent tabs. Guidance notes may be issued as clarifications or additional capital guidance are required.

### *The Entity*

Capital adequacy requirements will be applied to each DTI on a consolidated basis. The consolidated entity includes all subsidiaries (entities that are controlled) except insurance subsidiaries or other regulated financial institutions whose leverage is inappropriate for a deposit-taking institution and that, because of their size, would have a material impact on the leverage of the consolidated entity.

### *Assets to Capital Multiple*

Federally regulated deposit-taking institutions will be expected to meet an assets to capital multiple test. The assets to capital multiple is calculated by dividing the DTI's total assets, including specified off-balance sheet items, by its total capital. The definition of total capital to be used for this purpose is described below and expanded upon in tab 2. It is the same as that used for the risk-based capital ratio, and all items that are deducted from capital are excluded from total assets. Off-balance sheet items for this test are direct credit substitutes<sup>1</sup>, including letters of credit and guarantees, transaction-related contingencies, trade-related contingencies and sale and repurchase agreements, as described in tab 4. These are included at their notional principal amount. In the case of derivative contracts, where DTIs have legally binding netting agreements (meeting the criteria established in section 4-4), the resulting on-balance sheet amounts can be netted for the purpose of calculating the assets to capital multiple.

Under this test, total assets should be no greater than 20 times capital, although this multiple can be exceeded with the Superintendent's prior approval to an amount no greater than 23 times (see Assets to Capital Multiple Guidance Note). Alternatively, the Superintendent may prescribe a lower multiple. In setting the assets to capital multiple for individual DTIs, the Superintendent will consider such factors as operating and management experience, strength of parent, earnings, diversification of assets, type of assets and appetite for risk.

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<sup>1</sup> When a DTI, acting as an agent in a securities lending transaction, provides a guarantee to its client, the guarantee does not have to be included as a direct credit substitute for the assets to capital multiple if the agent complies with the collateral requirements of Guideline B-4, Securities Lending.

*Risk-based Capital Adequacy Framework*

Under the risk-based capital adequacy framework, a DTI's minimum capital requirement is defined as a ratio of total capital divided by the sum of risk-weighted assets and risk-weighted off-balance sheet items. At present, the framework for calculating risk-weighted amounts covers counterparty credit risk and, for qualifying DTIs, market risk. This guideline describes the counterparty credit risk framework; the companion market risk framework is addressed in Guideline A - Part II, Capital Adequacy Requirements - Market Risk. The Superintendent may in the future adjust capital requirements so that other risks - interest rate risk (not covered in CAR - Part II), operational risk and concentration risk - may be formally considered.

As with the assets to capital multiple, the Superintendent may prescribe a risk-based capital ratio requirement for each DTI. Where a higher ratio has not been prescribed specifically, DTIs will be expected to meet a minimum ratio of 8.0%.

*Definition of Capital (reference tab 2)*

The three primary considerations for defining the capital of a DTI 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 depositors and other creditors of the institution.

Total capital will comprise two tiers. Tier 1 (core capital) comprises the highest quality capital elements. Tier 2 elements (supplementary capital) 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. The definition of tier 2 capital differentiates between what are referred to as hybrid (tier 2A) and limited life instruments (tier 2B). The capital elements comprising tiers 1 and 2, as well as the various limits, restrictions and deductions to which they are subject, are described in tab 2.

### ***Risk-weighted Assets***

#### ***On-balance sheet (reference tab 3)***

To derive the denominator of the risk-based capital ratio, the assets of a DTI and credit equivalent amounts for off-balance sheet items are assigned to one of four broad risk categories:

- 0% cash and claims on OECD governments;
- 20% claims on Canadian deposit-taking institutions, OECD banks and non-domestic OECD public sector entities;
- 50% residential mortgages; and
- 100% all other claims.

Classification is according to the nature of the counterparty or, if relevant, of the guarantor or of the collateral.

Amounts included in these categories are multiplied by the risk weight for the category, with the resulting weighted values added together to arrive at total risk-weighted assets.

The amount of the assets deducted from capital is risk-weighted at 0%. Such assets might include goodwill, investments in unconsolidated subsidiaries, or back-to-back securities.

Recognition of collateral in reducing the credit risk of claims is limited to cash or securities issued by OECD central governments, OECD central banks, OECD public sector entities (reference tab 3-5 for definition of Canadian public sector entities), and specified multilateral development banks. That portion of a claim that is covered by collateral will be assigned the weight given to the collateral (that is, 0% or 20% - reference tab 5).

Loans or other exposures unconditionally guaranteed by OECD central governments, OECD public sector entities, OECD incorporated banks or Canadian deposit-taking institutions will attract the weight allocated to a direct claim on the guarantor. Claims guaranteed by non-OECD-incorporated banks will be assigned a 20% risk weight only where the underlying transaction has a residual maturity not exceeding one year.

Off-balance sheet assets (reference tab 4)

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 for non-derivative products, the face amount of the instrument must be multiplied by a credit conversion factor to derive a credit equivalent amount. Broadly, the credit conversion factors are:

- 100% direct credit substitutes;
- 50% transaction-related contingencies, such as bid bonds, performance bonds, etc.;
- 20% short-term, self-liquidating trade-related contingencies; and
- 0% unused portions of commitments with an original maturity of one year or less, or that are unconditionally cancellable at any time.

The resulting credit equivalent amount is then treated as an on-balance sheet instrument and is assigned the weight appropriate to the counterparty or, if relevant, the weight assigned to the guarantor or the collateral security.

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 DTIs may net off-balance sheet exposures (reference tab 4).



**Capital**

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## Capital

### *Summary of Capital Components*

#### *Tier 1: Core Capital*

- Common shareholders' equity, defined to include common shares, contributed surplus<sup>1</sup>, and retained earnings;
- Qualifying non-cumulative perpetual preferred shares;
- Qualifying innovative instruments; and
- Qualifying non-controlling interests arising on consolidation from tier 1 capital instruments.

#### *Deductions from Tier 1*

- Goodwill; and
- Identified intangible assets in excess of 5% of gross tier 1 capital.

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

#### *Tier 2: Supplementary Capital<sup>2</sup>*

- A. Hybrid (debt/equity) capital instruments:
  - Cumulative perpetual preferred shares;
  - Qualifying 99-year debentures;
  - Qualifying non-controlling interests arising on consolidation from tier 2 hybrid capital instruments; and
  - General allowances (up to 0.75% of risk-weighted assets, with written approval from OSFI).
- B. Limited life instruments:
  - 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.

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<sup>1</sup> Where repayment is subject to the Superintendent's approval.

<sup>2</sup> Tier 2 capital components are subject to straight-line amortization in the five years prior to maturity or the effective dates governing holders' retraction rights.

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

*Deductions from Total Capital (total of tier 1 and tier 2)*

- Investment in unconsolidated subsidiaries and in unconsolidated corporations in which the DTI has a substantial investment<sup>3</sup>.
- Other facilities that are treated as capital by unconsolidated subsidiaries and by unconsolidated corporations in which the DTI has a substantial investment.
- Back-to-back placements of new capital issues, arranged either directly or indirectly, between financial institutions.
- First-loss facilities as required under Guideline B-5, Asset Securitization.

*Limitations*

- A strongly capitalized DTI 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 DTI must immediately notify OSFI and provide an acceptable plan showing how the DTI proposes to quickly eliminate the excess.
- The amount of capital, 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 capital shall not exceed a maximum of 50% of net tier 1 capital.

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<sup>3</sup> The term “substantial investment” used in this guideline is defined in section 10 of the *Bank Act* and the *Trust and Loan Companies Act*.

### *Tier 1 Capital*

Tier 1 capital elements are restricted to the types listed in the summary on page 2-1-1, subject to requirements established by the Superintendent. Tier 1 capital instruments are intended to be permanent. Where tier 1 preferred shares provide for redemption by the issuer after five years with supervisory approval, OSFI would not normally prevent such redemptions by healthy and viable institutions, 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. The redemption or purchase for cancellation of tier 1 capital instruments requires the prior approval of the Superintendent.

#### *Preferred Shares (Tier 1)*

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

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

#### *Subordination*

Preferred shares must be subordinated to depositors and unsecured creditors of the DTI. If preferred shares are issued by a subsidiary or intermediate holding company for the funding of the DTI 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 was issued by the DTI.

#### *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;
- redemption within the first five years of issuance; and

- any step-up<sup>4</sup> 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;
- 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.

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

- 1) paying dividends on any shares ranking junior to the preferred shares (other than stock dividends in any shares ranking junior to the preferred shares);
- 2) 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);

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<sup>4</sup> An increase over the initial rate after taking into account any swap spread between the original reference index and the new reference index.

- 3) redeeming, purchasing or otherwise retiring less than all such preferred shares; or
- 4) 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 the interim appendix issued July 1999.

### *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 institution 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)*

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:

- unsecured, subordinated and fully paid up;
- 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;
- 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 DTI would not support payment.

Where hybrid instruments provide for redemption by the issuer after five years with supervisory approval, OSFI would not normally prevent such redemptions by healthy and viable institutions 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.

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 can be regarded as involving disguised capital repayment. To qualify for tier 2A, capital should not have a limited life.



Perpetual<sup>5</sup> debentures meeting the criteria for hybrid capital instruments<sup>6</sup> and with the following characteristics will be eligible for tier 2A capital:

- unsecured, subordinated and fully paid up:
- 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;
- available to participate in losses while the issuer is still a going concern. Therefore, if the retained earnings 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
- 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)

Limited life instruments are not permanent and include subordinated term debt and term preferred shares. The maximum amount of limited life instruments that can be included in tier 2 capital is 50% of net tier 1 capital. Limited life capital instruments must, at a minimum, have the following characteristics:

- subordination to deposit obligations and other senior creditors; and
- an initial minimum term greater than, or equal to, five years.

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<sup>5</sup> Perpetual includes debentures with a 99-year term.

<sup>6</sup> Bank debentures meeting the criteria of former guideline G-14 continue to be eligible for tier 2A capital.

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.

In the case of trust and loan companies, 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<sup>7</sup>, and would not trigger cross-default clauses under the covenants of other borrowing agreements of either the institution or the parent.

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<sup>7</sup> Including the principal amount of debt owed.

*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 deposits of the DTI due to a parent company guarantee or by any other contractual means.

If a subsidiary issues capital instruments for the funding of the DTI 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 was issued by the DTI 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, it is likely that this treatment will only be applicable to 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.

*Deductions/Adjustments*

The following items will be deducted from tier 1 capital:

- goodwill; and
- identified intangible assets in excess of 5% of gross tier 1 capital.<sup>8</sup> This rule applies to identified intangible assets purchased directly or acquired in conjunction with or arising from the acquisition of a business. These include, but are not limited to, trademarks, core deposit intangibles, mortgage servicing rights and purchased credit card relationships.

The following items will be deducted from the sum of tier 1 and 2 capital:

- investments<sup>9</sup> in unconsolidated subsidiaries and in unconsolidated corporations in which the DTI has a substantial investment<sup>10</sup>;
- other facilities that are treated as capital by unconsolidated subsidiaries and by unconsolidated corporations in which the DTI has a substantial investment;
- new capital issues between two or more financial institutions that represent, either directly or indirectly, back-to-back placements; and
- first loss facilities as required under Guideline B-5, Asset Securitization.

All items that are deducted from capital are excluded from total assets in calculating the assets to capital multiple and are risk-weighted at 0% in the risk-based capital adequacy framework.

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<sup>8</sup> For institutions with excess intangibles as at June 30, 1999, this deduction is to be phased in equally over 60 months. For example, a DTI with an October 31 year end and with intangible assets that exceed the 5% limit by \$100 would deduct the following amounts from tier 1 capital:

Fiscal Year	Amount	
Ending	Deducted	
1999	\$ 7	(4 months)
2000	27	
2001	47	
2002	67	
2003	87	
2004	100	

<sup>9</sup> The amount deducted will be based on the equity method of accounting.

<sup>10</sup> The term "substantial investment" used in this guideline is defined in section 10 of the *Bank Act* and the *Trust and Loan Companies Act*.

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.

*Limitations*

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

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

- a strongly capitalized DTI should not have innovative instruments and perpetual non-cumulative 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 a DTI's net tier 1 capital. If at any time this limit is breached, the DTI must immediately notify OSFI and provide an acceptable plan showing how the DTI 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; and
- 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 these tests; however, they will be taken into account when reviewing the overall strength of the DTI.

### *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.<sup>11</sup> 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 DTI 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 DTI with identical terms and conditions and capital attributes.

Superintendent approval is required for redemption at any time.

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<sup>11</sup> As noted on page 2-3-3, redemption of tier 2B instruments at the option of the issuer is permitted in the first five years with the prior written consent of OSFI.

### *Hedging of Subordinated Debentures*

When a DTI 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 depositors, the DTI 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 within the last three years to maturity will qualify as a full hedge; hedges to a call date or to a period greater than three years before maturity will not.

In addition, the DTI should disclose information of the hedging arrangement, the amount of the translation gains/losses and the accounting treatment accorded the translation gains/losses in a note to the capital adequacy 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.

*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 DTI 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:

<i>Years to Maturity</i>	<i>Included in Capital</i>
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 depositors.

Note:

Where the redemption is not subject to the Superintendent's approval, amortization should begin after year 5 for a 20-year debenture or share that can be redeemed at the DTI's option any time after the first 10 years. This would 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.

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 November 1, 1995 and be reflected in the January 31, 1996 capital adequacy return. An additional 20% amortization would be reflected in each subsequent January 31 return.



**On-Balance Sheet**

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## On-Balance Sheet

### *Risk Weight Categories: On-Balance Sheet and Off-Balance Sheet Credit Equivalent Amounts<sup>1</sup>*

#### *0% Risk Weight*

- Cash and gold bullion held in the DTI's own vaults or on an allocated basis to the extent backed by bullion liabilities.
- Claims on central governments and central banks denominated in national currency and funded in that currency.
- Other claims on OECD central governments and central banks or claims on organizations with the guarantee of OECD central governments (e.g., Export Development Corporation).
- Claims on 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.
- Residential mortgages insured under the NHA or equivalent provincial mortgage insurance programs.
- NHA mortgage-backed securities that are guaranteed by the Canada Mortgage and Housing Corporation.
- Unrealized gains and accrued receivables on foreign exchange and interest rate-related off-balance sheet transactions where they have been included in the off-balance sheet calculations.
- All deductions from capital, as specified on pages 2-1-1 and 2-1-2.

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<sup>1</sup> Risk weights can be reduced where a claim has been collateralized or guaranteed (reference tab 5).

*20% Risk Weight*

- Claims on securities firms incorporated in the OECD subject to comparable supervisory and regulatory arrangements (e.g., IDA in Canada, SEC in U.S.), in particular risk-based capital requirements<sup>2</sup> and claims guaranteed by these securities firms.
- Claims on PSEs directly and wholly-owned by a government in accordance with section 3-5.
- Claims on Canadian municipalities, school boards, universities, hospitals and social service programs that receive regular government financial support.
- Claims on multilateral development banks (reference 3-4).
- Claims, other than capital instruments, on OECD-incorporated banks and Canadian deposit-taking institutions, and their branches (reference 3-2).
- Claims, other than capital instruments, on banks incorporated in countries outside the OECD with a residual maturity of up to and including one year.
- Claims on non-domestic OECD public-sector entities, excluding central governments.
- Cheques and other items in transit.

*50% Risk Weight*

- Loans secured by first mortgages on one- to four-unit residential dwellings, provided that such loans are not 90 days or more past due and do not exceed a loan-to-value ratio of 75%.
- Collateral mortgages (first and junior) 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 and such loans are not more than 90 days past due and do not, collectively, exceed a loan-to-value ratio of 75%.

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<sup>2</sup> i.e., capital requirements that are comparable to those applied to DTT's in Part I and II of this guideline. Implicit in the meaning of the word "comparable" is that the securities firm (but not necessarily its parent) is subject to consolidated regulation and supervision with respect to any downstream affiliates.

- Holdings of mortgage-backed securities fully and specifically secured against qualifying residential mortgage loans (reference 3-7).
- Credit risk equivalent of off-balance sheet exposures arising from forwards, swaps, purchased options and other similar derivatives to counterparties that would otherwise attract a 100% risk weight.

*100% Risk Weight*

- Claims on the private sector.
- Claims on banks incorporated outside the OECD with residual maturity of over one year.
- Claims on central governments and central banks outside the OECD (unless denominated in national currency and funded in that currency).
- Claims on entities in which a government may have an ownership interest but that do not meet the 0% or 20% risk weight criteria.
- Claims on entities directly and wholly-owned by a government, but where the assignment of a 20% risk weight would, in the opinion of the parent government, seriously disadvantage private sector competition.
- Claims on U.N. agencies (other than the IBRD and the IFC) and EUROFIMA.
- Claims on non-bank parents or affiliates of OECD banks.
- Consolidated claims of a foreign subsidiary incorporated in a non-OECD country on the local central government or central bank (unless denominated and funded in local currency), even though the foreign subsidiary would be entitled to a 0% weight on such claims.
- Claims on the 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 3-4).
- Holdings of subordinated bonds issued by multilateral development banks.
- Premises, plant and equipment and other fixed assets.

- Real estate and other investments (including non-consolidated investment participation in other companies).
- Capital instruments issued by other financial institutions (unless deducted from capital).
- Amount receivable resulting from the sale of mortgages under the NHA mortgage-backed securities program.
- All other assets.

*Canadian Deposit-taking Institutions and Banks*

Canadian deposit-taking institutions include federally and provincially regulated institutions that take deposits and lend money. These include banks, trust and loan companies and co-operative 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.

*OECD Countries*

For purposes of this guideline, the OECD (Organization for Economic Co-operation and Development) 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 excludes any country within this group that has rescheduled its external sovereign debt in the previous five years. Currently, OECD countries qualifying for a preferential risk weight are:

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

***Multilateral Development Banks (MDBs)***

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)



*Risk Weights for Public Sector Entities (PSEs)*

*Canada*

The following is the set of criteria for risk weights to be assigned to the obligation of PSEs in Canada:

*0% Risk Weight*

- 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.

*20% Risk Weight*

- Entities directly and wholly-owned by a government.
- School boards, hospitals, universities and social service programs that receive regular government financial support, and municipalities.

*100% Risk Weight*

- Entities in which a government may have an ownership interest, but that do not meet the 0% or 20% risk weight criteria.
- Entities that meet the 20% risk weight criteria, but where the assignment of a 20% risk weight would, in the opinion of the parent government, seriously disadvantage private sector competition.

*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 receiving a risk weight lower than 100% would seriously disadvantage private sector competitors. Therefore, PSEs in this list should be assigned a 100% risk weight unless banks verify that the debt obligations have been fully, unconditionally and explicitly guaranteed in accordance with 3-6.

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 these guarantees, banks will be permitted to reduce the risk weight of 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

*Quebec*

1. Société de récupération, d'exploitation et de développement forestiers du Québec (REXFOR)
  - Les produits forestiers Bellerives – 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*

Claims on other OECD countries' public sector entities are risk-weighted at 20% or, if in the opinion of the host government in competition with the private sector, 100%.

Similarly, other OECD countries will uniformly risk weight claims on Canadian public sector entities at 20% or, if in the opinion of the host government in competition with the private sector, 100%.

*Non-OECD Countries*

PSEs in these countries are risk-weighted at 100%.

### *Securities Lending*

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

When the DTI lends its own securities, the credit risk is based on the higher of:

- the counterparty credit risk on the instrument lent; or
- the counterparty credit risk of the borrower of the securities. This risk could be reduced if the DTI held eligible collateral (reference 5-1). Where the DTI lends securities through an agent and receives an explicit guarantee of the return of the securities, the DTI's counterparty is the agent.

When the DTI, acting as agent, lends securities on behalf of a client and guarantees that the securities lent will be returned or the DTI 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 DTI held eligible collateral.

### *Mortgage-backed Securities*

NHA mortgage-backed securities that are guaranteed by the Canada Mortgage and Housing Corporation (CMHC) shall carry a 0% risk weight in recognition of the fact that obligations incurred by CMHC are legal obligations of the Government of Canada.

Mortgage-backed securities that are of the pass-through type and are effectively a direct holding of the underlying assets shall receive the risk weight associated with the underlying assets, provided all the following conditions are met:

- the underlying mortgage pool may contain only mortgages that are fully performing when the mortgage-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 mortgage loans;
- the underlying mortgages are assigned to an independent third party for the benefit of the investors in the securities who will then own the underlying mortgages;
- the arrangements for the special-purpose vehicle and trustee must provide that these obligations are observed:
  - if a mortgage administrator or a mortgage 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 mortgage loans;
  - the vehicle and trustee must be legally separate from the originator of the pooled mortgage loans;
  - the vehicle and trustee must be responsible for any damage or loss to investors created by their own or their mortgage servicer's mismanagement of the pooled mortgages; and
  - 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 the mortgagor defaults;
- the holder of the security must have a pro-rata share in the underlying mortgage assets or the vehicle that issues the security must have only liabilities related to the issuing of the mortgage-backed security;
- the cash flows of the underlying mortgages 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 mortgage loans.

Mortgage-backed securities that do not meet these conditions will receive a risk weight of 100%. Stripped mortgage-backed securities or different classes of securities (senior/junior debt, residual tranches) that bear more than their pro-rata share of losses would automatically receive a 100% risk weight.

Where the underlying pool of assets are composed of assets that would attract different risk weights, the risk weight for the securities will be the highest risk weight associated with the underlying assets.



***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 risk weighting accorded to the asset should be the higher of the risk weight of the security and the risk weight of the counterparty to the transaction (net of any eligible collateral (reference 5-1)).

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. Where the asset temporarily acquired is a security that attracts a preferential risk weighting, this would be recognized as collateral and the risk weighting would be reduced accordingly.

**Off-Balance Sheet**

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Forwards, Swaps, Purchased Options and Other  
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## Off-Balance Sheet

### *Categories of Off-Balance Sheet Instruments (Credit Conversion Factor)*

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 DTI 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 participation in bankers' acceptances and risk participation in financial letters of credit. Risk participation constitutes guarantees by the participating DTIs such that, if there is a default by the underlying obligor, they will indemnify the selling DTI for the full principal and interest attributable to them; and
- securities lending transactions, where the DTI 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 DTI 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 DTI for which the institution is acting as reimbursement agent should not be considered as 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 pre-determined price. In any circumstance where these are not reported on-balance sheet, they should be reported as an off-balance sheet exposure with a 100% conversion factor.

*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 pre-determined 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 pre-determined 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 4-5)*

A commitment involves an obligation (with or without a material adverse change or similar clause) of the DTI to fund its customer in the normal course of business should the customer seek to draw down 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 4-3)*

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

*Interest Rate Swaps (see 4-3)*

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 4-3)*

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 4-3)*

A forward foreign exchange contract is an agreement between a DTI and a counterparty in which the DTI 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 4-3)*

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 4-3)*

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

*Financial and Foreign Currency Futures (see 4-3)*

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 4-3)*

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

*Non-equity Warrants (see 4-3)*

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 exchange rate contracts.

### *Credit Conversion*

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 4-3. The resulting credit equivalent amount is then treated in a manner similar to an on-balance sheet instrument and is assigned the risk weight appropriate to the counterparty or, if relevant, the guarantor or collateral. The categories of credit conversion factors are outlined below.

#### *Credit Conversion Factors*

##### *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 participation in bankers' acceptances and participation 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 characteristics of a credit enhancement.<sup>1</sup>

##### *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.

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<sup>1</sup> Written put options expressed in terms of market rates for currencies or financial instruments bearing no credit risk are excluded from the framework.



*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.

*Forwards, Swaps, Purchased Options and Other Similar Derivative Contracts*

The treatment of forwards, swaps, purchased options and other similar derivatives needs special attention because DTIs 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 4-3-2) and are assigned the risk weight appropriate to the counterparty. However, in recognition of the quality of market participants, a 50% weight is applied in respect of counterparties that would otherwise attract a 100% weight.

The add-on (reference 4-3-2) 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.

- 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. Foreign exchange rate contracts include:
- gold contracts<sup>2</sup>;
  - cross-currency swaps;
  - cross-currency interest rate swaps;
  - outright forward foreign exchange contracts;
  - currency futures; and
  - currency options purchased.
- C. Equity contracts include:
- futures;
  - forwards;
  - swaps;
  - purchased options; and
  - similar contracts based on both individual equities as well as on equity indices.

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<sup>2</sup> Gold contracts are treated the same as foreign exchange rate contracts for the purpose of calculating credit risk except that contracts with original maturity of 14 calendar days or less are included.

D. Precious metals (i.e., silver, platinum, and palladium) 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., aluminium, copper, and zinc); and
- other non-precious metal commodity contracts.

DTIs should calculate the credit equivalent amount of these contracts using the **current exposure method**. Under this method, an institution adds:

- the amount for potential future credit exposure (or "add-on") of all contracts (this is calculated by multiplying the notional principal amounts by the add-on factors in the following table); plus
- the replacement cost (obtained by "marking to market") of all its contracts<sup>3</sup> with positive value.

<b>Add-on Factors</b>					
<b>Residual Maturity</b>	<b>Interest Rate</b>	<b>Foreign Exchange Rate and Gold</b>	<b>Equity</b>	<b>Precious Metals Except Gold</b>	<b>Other Commodities</b>
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%

<sup>3</sup> Foreign exchange rate contracts with an original maturity of 14 calendar days or less may be excluded from the capital calculation but should be reported on CAR 4 Appendix 1.

A worksheet similar to that set out below could be used to determine the risk-weighted equivalent of non-netted contracts (for netted contracts refer to page 4-4-1):

<b>Type of Contract</b>	<b>Notional Principal Amount 1</b>	<b>Positive Replacement Cost (MTM) 2</b>	<b>Add-On Factor % 3</b>	<b>Potential Credit Exposure 1 x 3 = 4</b>	<b>Credit Equivalent 2 + 4 = 5</b>	<b>Risk Weight % 6</b>	<b>Risk-Weighted Equivalent 5 x 6 = 7</b>
<b>Interest Rate</b>							
≤ 1 year			0.0 0.0 0.0			0 20 50	
> 1 year ≤ 5 years			0.5 0.5 0.5			0 20 50	
>5 years			1.5 1.5 1.5			0 20 50	
<b>Foreign Exchange Rate and Gold</b>							
≤ 1 year			1.0 1.0 1.0			0 20 50	
> 1 year ≤ 5 years			5.0 5.0 5.0			0 20 50	
> 5 years			7.5 7.5 7.5			0 20 50	

Type of Contract	Notional Principal Amount 1	Positive Replacement Cost (MTM) 2	Add-On Factor % 3	Potential Credit Exposure 1 x 3 = 4	Credit Equivalent 2 + 4 = 5	Risk Weight % 6	Risk-Weighted Equivalent 5 x 6 = 7
<b>Equity</b>							
≤ 1 year			6.0 6.0 6.0			0 20 50	
> 1 year ≤ 5 years			8.0 8.0 8.0			0 20 50	
> 5 years			10.0 10.0 10.0			0 20 50	
<b>Precious Metals Except Gold</b>							
≤ 1 year			7.0 7.0 7.0			0 20 50	
> 1 year ≤ 5 years			7.0 7.0 7.0			0 20 50	
> 5 years			8.0 8.0 8.0			0 20 50	
<b>Other Commodities</b>							
≤ 1 year			10.0 10.0 10.0			0 20 50	
> 1 year ≤ 5 years			12.0 12.0 12.0			0 20 50	
> 5 years			15.0 15.0 15.0			0 20 50	

Notes to the matrix and worksheet:

1. Instruments traded on exchanges may be excluded 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 such that the market value of the contract is zero on these specified dates, the residual maturity would be set equal to 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 these criteria, the add-on factor is subject to a floor of 0.5%.
4. Contracts not covered by any of the rows 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 (replacement cost).
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, DTIs 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 whether the replacement cost is positive or negative.
8. Exchange rate contracts with an original maturity of 14 calendar days or less may be excluded from the capital calculation but should be reported on CAR 4 Appendix 1.

*Netting of Forwards, Swaps, Purchased Options and Other Similar Derivatives*

DTIs 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.

DTIs that wish to net transactions under either novation or another form of bilateral netting will need to satisfy OSFI<sup>4</sup> that the following conditions are met.

- i. The DTI must have a netting contract or agreement with each counterparty that creates a single legal obligation, covering all included transactions subject to netting. The result of such an arrangement would be that the DTI 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 of the transactions with that counterparty in the event of default, bankruptcy, liquidation or similar circumstances.
- ii. The DTI 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 chartered 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 DTI must have procedures in place to ensure that a regular review of the legal characteristics of the 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.

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<sup>4</sup> If any supervisor is dissatisfied about enforceability under the laws of its country, neither counterparty could net the contracts for capital purposes.

Credit exposure on bilaterally netted forwards, swaps, purchased options and other similar derivatives transactions is calculated as the sum of the net mark-to-market replacement cost, if positive, plus an add-on for potential future credit exposure 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 potential future credit exposure for netted transactions ( $A_{Net}$ ) equals the sum of: (i) 40% of the add-on as presently calculated ( $A_{Gross}$ )<sup>5</sup>; and (ii) 60% of the add-on multiplied by the ratio of net current replacement cost to positive current replacement cost (NPR)<sup>6</sup>.

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.

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<sup>5</sup>  $A_{Gross}$  equals the sum of the potential future credit exposures (i.e., notional principal amount of each transaction times the appropriate add-on factor from 4-3) for all transactions subject to legally enforceable netting agreements.

<sup>6</sup> Positive replacement cost is referred to as gross replacement cost in BIS documents; similarly the NPR is referred to as the NGR.



### 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 1					
Transaction	Notional Principal Amount 1	Add-on Factor (ref. 4-3-2) 2	Potential Credit Exposure 1 x 2 = 3	Positive Replacement Cost 4	Negative Replacement Cost 5
1					
2					
3					
Etc.					
<b>Total</b>			$A_{Gross}$	$R^+$	$R^-$

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 DTIs 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 DTIs 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 <sup>+</sup> )		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 institution is using the counterparty-by-counterparty basis or the aggregate basis. The DTI 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  $> 0$   

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

For netted contracts where the net replacement cost is  $= 0$   

$$.4 * A_{Gross}$$

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 risk weight and enter the total credit equivalent amount on CAR 4.

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.

### *Commitments*

Commitments are arrangements that obligate a DTI, 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.

### *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% or 50%, as outlined below.

### *0% Conversion Factor*

- Commitments with an original maturity of one year and under; and
- Commitments with an original maturity of over one year where:
  - the DTI has full discretion to withdraw the commitment at any time without notice; and
  - the DTI 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% Conversion Factor*

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

*Maturity*

DTIs 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 DTI 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 DTI 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 DTI's credit standards, and provides the DTI 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 DTI 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 financial institution 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 Drawn Down 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 DTI 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 redrawdowns, etc., the client can access a line of credit past one year, with no opportunity for the DTI to unconditionally cancel the commitment within one year, the commitment shall be converted at 50%.

#### Commitments for Off-balance Sheet Transactions

An over-one-year commitment to provide an off-balance sheet facility (such as a standby letter of credit) should normally use the credit conversion factor of the applicable off-balance sheet instrument.

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## General Guidance

### *Collateral*

Claims on a counterparty collateralized by cash or by securities issued by OECD central governments, OECD central banks, OECD public sector entities or multilateral development banks, may be assigned the risk weight of the collateral, as follows:

- 0% - cash<sup>1</sup>;
- securities issued by OECD central governments, OECD central banks; 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;
- 20% - securities issued by Canadian municipalities and PSEs directly and wholly-owned by a government in accordance with Section 3-5, and non-domestic OECD public sector entities; and
- multilateral development banks' securities.

No other forms of collateral, including DTI securities, may reduce a risk weighting. If the value of the collateral covers less than the book value of the asset, only the part of the asset that is fully covered may receive the appropriate lower weight. 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 currency deposits or deposit certificates issued by and deposited with the lending institution. For these purposes, an exposure is collateralized by cash only if the cash is held by the reporting institution for the account of the depositor/customer on express terms such that:

- the cash may not be withdrawn for the duration or remaining duration of the exposure; and

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<sup>1</sup> Gold held as collateral may be considered the equivalent to cash where the claim is made in gold.



- the reporting institution 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 claim 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 risk weight of 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 bank will be considered the counterparty for the collateralized portions of loan held by the other participating institutions and they may reduce the risk weight on that portion of the loan accordingly.

To illustrate, assume a \$100 loan is syndicated with five institutions each holding \$20. The agent bank - an OECD bank - holds cash collateral of \$50, representing \$10 for each of the \$20 portions of the loan. The agent may risk weight \$10 of its \$20 portion at 0%. The other financial institutions may each risk weight \$10 of their \$20 portion at 20% (the risk weighting accorded the agent bank - the counterparty).

### *Guarantees*

Claims that have been explicitly, irrevocably and unconditionally guaranteed by OECD central governments, OECD public-sector entities, OECD incorporated banks, Canadian deposit-taking institutions, banks incorporated outside the OECD where the claim has a residual maturity of one year or less, multilateral development banks, or securities firms incorporated in the OECD subject to comparable supervisory and regulatory arrangements, may be weighted according to the risk weight of the guarantor 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 a claim is partially guaranteed, only that part of the claim that is fully guaranteed will be weighted according to the risk weight of the guarantor. Claims guaranteed by non-OECD governments or central banks may also be recognized where the claim is denominated and funded in local currencies.

A guarantee by a parent or an unconsolidated affiliate that qualifies for a 20% risk weight of a claim on a third party will not reduce the risk weighting of the assets of the subsidiary DTI in Canada. This treatment follows the principle that parent company guarantees are not a substitute for capital. An exception is made for self-liquidating trade-related transactions that have a tenure of 360 days or less, are market-driven and are not structured to avoid guidelines. These would be eligible for a 20% counterparty risk weight if the entity providing the guarantee qualifies for this reduced risk weight. The requirement that the transaction be "market-driven" necessitates that the guarantee or letter of credit is requested and paid for by the customer and/or that the market requires the guarantee in the normal course.

*Acceptances with Risk Participation*

Federally regulated deposit-taking institutions in Canada are required to report on their balance sheets the full amount of acceptances issued, regardless of whether portions have been participated, and risk weight the full amount for capital adequacy purposes. However, the counterparty of the participated portions for risk weighting purposes is deemed to be the participating institutions.

The participated portion of the acceptance should not appear on the balance sheet of the participating DTI. It should be reported with other guarantees in the notes to the financial statements. A 100% credit conversion factor is applied to these off-balance sheet items and the customer in whose name the acceptance is issued is considered the counterparty to the transaction for risk weighting purposes.

For example, assume a \$100 acceptance for a commercial enterprise has been participated to four other OECD banks in equal portions. The lead DTI would risk weight its portion of the acceptance (\$20) at 100%. The remaining \$80 would be risk-weighted at 20%. The participating DTI would apply a 100% credit conversion factor to their respective \$20 portions and risk weight this amount at 100%.



# Guideline

**Subject: Capital Adequacy Requirements - Market Risk**

**No: A - Part II                      Date: November 1997**

In January 1996 the Bank for International Settlements issued an amendment to the Capital Accord that sets out a framework for calculating the capital requirements for market risk. This guideline outlines how this framework will be applied to Canadian deposit-taking institutions.

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**Overview**

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### *Overview of the Framework*

This section provides an overview of the capital adequacy requirements for market risk for Canadian deposit-taking institutions. More detailed information on specific components of the calculations is contained under subsequent tabs.

These requirements apply only to those institutions where the greater of the value of trading book assets or the value of trading book liabilities:

- is at least 10% of total assets; and
- exceeds \$1 billion,

although OSFI will retain the right to apply the framework to other institutions, on a case by case basis, if trading activities are a large proportion of overall operations.

### *Risk Framework - Definitions*

The risk-based capital framework addresses credit risk and market risk. Credit risk is the risk that one party to a financial instrument will fail to discharge an obligation and cause the other party to incur a financial loss. Credit risk is seen as the most significant risk for the non-trading book activities of an institution. The capital requirements that address credit risk are set out in Guideline A - Part I and apply to non-trading on-balance sheet assets and off-balance sheet assets such as guarantees, letters of credit, commitments and derivative instruments.

Market risk is the risk of losses in on- and off-balance sheet positions arising from movements in market prices. The risks pertaining to this requirement are:

- for instruments in the trading book:
  - interest rate position risk; and
  - equity position risk.
- throughout the institution:
  - foreign exchange risk<sup>1</sup>; and
  - commodities risk.

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<sup>1</sup> Excluding structural positions as defined on page 2-3-3.

### *Measurement Approaches*

In measuring their market risks, institutions may choose between two broad methodologies: the standardized approach or internal models.

#### Standardized Approach

The standardized methodology uses a "building-block" approach. The capital charge for each risk category is determined separately. Within the interest rate and equity position risk categories, separate capital charges for specific risk and the general market risk arising from debt and equity positions are calculated. Specific risk is defined as the risk of loss caused by an adverse price movement of a debt instrument or security due principally to factors related to the issuer. General market risk is defined as the risk of loss arising from adverse changes in market prices. For commodities and foreign exchange, there is only a general market risk capital requirement. A summary of the capital charges by instrument is in Appendix 1-I.

The standardized approach is described under tab 2. The first four sections deal with interest rate, equity position, foreign exchange and commodities risk. A fifth section sets out two possible methods for measuring the market risk in options of all kinds.

#### Internal Models

The focus of most internal models is an institution's general market risk exposure, leaving specific risk to be measured through separate credit risk measurement systems. Institutions using models are subject to capital charges for the specific risk not captured by their models. For institutions using models that include specific risk, the total specific risk charge applied to debt securities or to equities should in no case be less than half the specific risk charges calculated according to the standardized methodology.

For institutions using their own internal risk management models to calculate the capital charge(s) there are seven sets of conditions that they must meet. These are described in detail under tab 3. These conditions are:

- certain general criteria concerning the adequacy of the risk management system;
- qualitative standards for internal oversight of the use of models, notably by management;
- guidelines for specifying an appropriate set of market risk factors (i.e., the market rates and prices that affect the value of institutions' positions);
- quantitative standards setting out the use of common minimum statistical parameters for measuring risk;
- guidelines for stress testing and back testing;



- validation procedures for external oversight of the use of models; and
- rules for institutions which use a mixture of models and the standardized approach.

Institutions with significant trading activities are encouraged to move towards a models approach. The need for the standardized approach will be reviewed in future when the industry's internal measurement systems are more refined.

### *Application*

On-balance sheet assets held in the trading book are subject only to the market risk capital requirements. Derivative instruments held in the trading book are subject to both the market risk and the credit risk capital requirements. This is because they face the risk of loss due to:

- market fluctuations in the value of the underlying instrument;
- failure of the counterparty to the derivative contract.

Similarly, on-balance sheet assets held outside the trading book and funded by another currency and unhedged for foreign exchange exposure are subject to both the market risk (i.e., foreign exchange) and credit risk capital requirements.

### *Trading Book*

Each institution should have a policy providing a definition of what items should be allocated to the trading book. For example, it may include on- and off-balance sheet positions in financial instruments acquired with the intent to resell in order to profit from short-term price or rate movements (or other price or rate variations). All trading book positions must be marked to market daily and the results reflected in an institution's earnings statement.

For market risk capital purposes, an institution may include in its measure for general market risk certain non-trading book instruments that it deliberately uses to hedge trading positions. Such instruments are not subject to a specific risk capital charge, but instead, remain subject to the credit risk capital requirements. On the other hand, an institution should exclude instruments used to hedge non-trading book positions.

An institution may not include or exclude items in the trading book to manipulate associated capital charges. The institution's policy should include the separation of responsibilities for trading and investment portfolios and set out the approval process for moving an item from one book to another. Where this occurs there should be a clear trail documenting management's change of intent that will be reviewed, at a minimum, by internal audit and external audit. OSFI will monitor the way in which institutions allocate financial instruments to the trading book and non-trading book and will seek to ensure consistent implementation through the examination process.

*The Entity*

In the same way as for credit risk, the capital requirements for market risk are to apply on a consolidated basis. OSFI will permit financial entities in a group which is running a global consolidated book and whose capital is being assessed on a global basis to report short and long positions in exactly the same instrument (e.g., currencies, commodities, equities or bonds), on a net basis, no matter where they are booked. Nonetheless, there may be circumstances in which individual positions should be taken into the measurement system without any offsetting against positions in the remainder of the group. This may be needed, for example, where there are obstacles to the quick repatriation of profits from a foreign subsidiary or where there are legal and procedural difficulties in carrying out the timely management of risks on a consolidated basis. Institutions should document the rationale and procedures for determining when positions should be netted and not netted. These should be available for OSFI review. Moreover, OSFI will retain the right to monitor the market risks of individual entities on a non-consolidated basis to ensure that significant imbalances within a group do not escape supervision.

### *Definition of Capital*

The criteria for tier 1 and tier 2 capital are set out in Part I of this guideline. Capital that can be used to satisfy the market risk requirements is:

- tier 1 and 2 capital to the extent that it is not being used to satisfy the credit risk capital requirement; and
- tier 3 capital.

Tier 3 capital is subordinated debt subject to the following conditions:

- minimum original maturity of two years;
- payment of either interest or principal (even at maturity) shall be deferred if such payment would cause the institution to fall below the minimum capital requirement in Guideline A Parts I and II; and
- not redeemable before maturity without prior approval by OSFI.

In addition, tier 3 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 institution 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.

OSFI would not normally expect to give consent to any repayment or redemption of subordinated debt within two years from the date of issuance. Repayment or redemption will only be granted when OSFI is satisfied that the institution's capital will be adequate after repayment and is likely to remain so. Unlike tier 2 capital, tier 3 subordinated debt does not have to be amortized over its life.

### *Limitations*

An institution must satisfy the following limits:

- limit on tier 2B capital:
  - total tier 2B capital cannot exceed 50% of total tier 1;

- limits on capital used to meet credit risk capital requirements:
  - tier 2 capital used to meet the credit risk capital requirements cannot exceed 100% of the tier 1 capital used to meet those requirements;
  
- limits on capital used to meet the market risk capital requirements:
  - tier 2 and tier 3 capital used to meet the market risk capital requirements must not - in total - exceed 200% of the tier 1 capital used to meet those requirements; and
  
- overall limit:
  - tier 2 and tier 3 capital cannot - in total - normally exceed 100% of the institution's tier 1 capital. This limit cannot be exceeded without the OSFI's express permission, which will only normally be granted where an institution engages mainly in business subject to the market risk capital charge.

Where an institution has any tier 3 subordinated debt surplus to the ratios described above, this debt will be disregarded in the calculation of the institution's capital ratios (see Appendix 1-II).

### ***Capital Requirement***

Each institution will be expected to monitor and report the level of risk against which a capital requirement is to be applied. The institution's overall minimum capital requirement will be:

- (a) the credit risk requirements, excluding debt and equity securities in the trading book and all positions in commodities, but including the credit counterparty risk on all over-the-counter derivatives whether in the trading or non-trading book; plus
- (b) either the sum of the capital charges for market risks as determined using the standardized approach; or
- (c) the measure of market risk derived from the models approach; or
- (d) a mixture of (b) and (c) summed arithmetically.

All transactions, including forward sales and purchases, shall be included in the calculation of capital requirements on a trade date basis. Although regular reporting will take place only quarterly, institutions are expected to manage risks in such a way that the capital requirements are being met on a continuous basis, i.e., at the close of each business day. Institutions are also expected to maintain strict risk management systems to ensure that intra-day exposures are not excessive.

### ***Implementation***

The market risk capital requirements take effect January 1, 1998. Institutions with an October 31 year-end will be required to report their capital ratios for the credit and market risk requirements on January 31, 1998. For institutions with a December 31, year-end reporting will start on March 31, 1998.

**Appendix I**

**Summary of Capital Charges by Instrument**

The following table has been provided for illustrative purposes and is intended to give a broad indication of capital charges that would apply to selected instruments. Specific instruments may be subject to additional charges, for example a debt instrument denominated in a foreign currency and held in the trading book would be subject to both the general market risk charge for interest rate position risk and foreign exchange risk. The same debt instrument held outside the trading book would be subject to a general market risk charge for foreign exchange and a credit default risk charge.

Instruments	Specific Risk Charge	General Market Risk Charge	Options Risk Charge	Credit Default Risk Charge <sup>2</sup>
<b>Interest rate position risk</b>				
Debt instruments <sup>3</sup>	X	X		
Debt forward contracts <sup>3</sup>	X	X		X
Debt index forward contracts <sup>3</sup>		X		X
<b>Equity position risk</b>				
Equity instruments <sup>3</sup>	X	X		
Equity forward contracts <sup>3</sup>	X	X		X
Equity index forward contracts <sup>3</sup>	X <sup>4</sup>	X		X
<b>Foreign exchange risk</b>				
Foreign exchange spot		X		X
Foreign exchange forward		X		X
<b>Commodities risk</b>				
Gold spot		X		X
Gold forward contracts		X		X
Commodity spot		X		X
Commodity forward contracts		X		X

<sup>2</sup> Foreign exchange contracts with an original maturity of 14 calendar days or less and/or exchange traded contracts subject to daily margining requirements may be excluded from the capital calculation.

<sup>3</sup> This refers only to trading book instruments.

<sup>4</sup> Diversified equity indices require a low specific risk charge of 2% to cover execution and tracking risks.

Instruments	Specific Risk Charge	General Market Risk Charge	Options Risk Charge	Credit Default Risk Charge <sup>2</sup>
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OPTIONS PORTFOLIOS

*Simplified Method*

Debt options purchased <sup>3</sup>			X	X
Debt index options purchased <sup>3</sup>			X	X
Equity options purchased <sup>3</sup>			X	X
Equity index options purchased <sup>3</sup>			X	X
Foreign exchange options purchased			X	X
Gold options purchased			X	X
Commodity options purchased			X	X

*Scenario Method*

Debt options <sup>3</sup>	X		X	X
Debt index options <sup>3</sup>			X	X
Equity options <sup>3</sup>	X		X	X
Equity index options <sup>3</sup>	X <sup>5</sup>		X	X
Foreign exchange options			X	X
Gold options			X	X
Commodity options			X	X

<sup>5</sup> Diversified equity indices require a low specific risk charge of 2% (multiplied by the notional value of the underlying and the option's delta as set out on page 2-5-5) to cover execution and tracking risks.

**Appendix II**

**Allocation of Capital in the Calculation of the Capital Ratios**

This is an example of how an institution would allocate capital to its maximum advantage in determining its capital ratios.

Assume an institution has:

- tier 1 capital of \$700
- tier 2 capital of \$100
- tier 3 capital of \$600

It has determined that to meet the minimum capital requirement of 8% for credit risk, it requires \$600 of capital. To meet its market risk capital requirements, it requires \$300 of capital.

Therefore to meet the credit risk requirements, it would allocate:

- tier 1 capital \$500
- tier 2 capital \$100 (i.e., all tier 2 capital would be used)

To meet the market risk requirements, it would allocate:

- tier 1 capital \$100
- tier 3 capital \$200 (i.e., up to the limit of 200% of tier 1).

The surplus \$400 of tier 3 capital would remain unused. The surplus \$100 of tier 1 capital could be used to increase its credit risk capital ratio above the 8% minimum.



**Standardized Approach**

Interest Rate Position Risk ..... 2-1

Equities Risk ..... 2-2

Foreign Exchange Position Risk ..... 2-3

Commodities Risk ..... 2-4

Options ..... 2-5

### *Interest Rate Position Risk*

This section describes the way in which an institution will calculate its capital requirement for interest rate positions held in the trading book where that institution does not use an internal model that meets the criteria set out under Tab 3. The interest rate exposure captured includes exposures arising from interest-bearing and discounted financial instruments, derivatives based on the movement of interest rates and interest rate exposures embedded in derivatives based on non-interest related derivatives including foreign exchange forward contracts. The market risk capital charge for interest rate options in an institution's trading book is calculated separately in accordance with section 2-5.

Convertible bonds, i.e., debt instruments or preference shares that are convertible, at a stated price, into common shares of the issuer, will be treated as debt securities if they trade like debt securities and as equities if they trade like equities. Convertible bonds must be treated as equities where:

- a) the first date at which conversion may take place is less than three months ahead, or the next such date (where the first has passed) is less than a year ahead; and
- b) the convertible is trading at a premium of less than 10%, where the premium is defined as the current mark to market value of the convertible less the mark to market value of the underlying equity, expressed as a percentage of the mark to market value of the underlying equity.

An institution's interest rate position risk requirement is the sum of the capital required for *specific risk* and *general market risk* for each currency in which the institution has a trading book exposure.

#### *Specific Risk*

The specific risk capital charge is calculated by multiplying the absolute values of the debt positions in the trading book by their respective risk factors. The risk factors, as set out below in Table I, correspond to the category of the obligor and the residual maturity of the instrument. For this calculation, offsetting of long and short positions is permitted for debt positions in identical issues (including certain derivative contracts). Even if the issuer is the same, no offsetting is permitted between different issues to arrive at a net holding since differences in currencies, coupon rates, liquidity, call features, etc., mean that prices may diverge in the short run.

**TABLE I**  
**Specific Risk Categories and Weights**

Category	Remaining Maturity [contractual]	Factor [In percent]
Government	N/A	0.00
Qualifying	6 months or less	0.25
	6 to 24 months	1.00
	over 24 months	1.60
Other	N/A	8.00

A specific risk charge will apply to derivative contracts in the trading book only when they are based on an underlying instrument. For example, where an interest rate swap is based on an index of Bankers Acceptance rates, there will not be a specific risk charge. However an option based on a corporate bond will generate a specific risk charge. Appendix 2-1-III includes examples of derivatives in the trading book that require a specific risk charge and derivatives in the trading book that do not.

The specific risk charge for derivative contracts is calculated by multiplying:

- the market value of the effective notional amount of the debt instrument that underlies an interest rate swap, future or forward;
- by:
- the specific risk factors in Table I that correspond to the category and residual term of the underlying debt instrument.

The effective notional amount of a derivative is the market value of the stated underlying debt instrument adjusted to reflect any multiplier applicable to the contract's reference rate(s) or, where there is no multiplier component, simply, the market value of the stated underlying debt instrument.

All over-the-counter derivative contracts are subject to the counterparty credit risk charges determined in accordance with Part I of Guideline A, even where a specific risk charge is required. A specific risk requirement would arise if the derivative position was based on an underlying instrument or security. For example, if the underlying security was a AAA rated corporate bond, the derivative will attract a specific risk requirement based on the underlying bond. However, where the derivative was based on an underlying exposure that was an index (e.g., interbank rates), no specific risk would arise.

### Government

The *government* category includes all forms of debt instruments, including but not limited to bonds, treasury bills and other short-term instruments:

- issued by, fully guaranteed by, or fully collateralized by securities issued by central governments of the OECD-based group of countries<sup>1</sup>, Canadian 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; or
- issued by, or fully guaranteed by, non-OECD central governments and denominated in local currency of that government and funded by liabilities booked in that currency.

### Qualifying

The *qualifying* category includes debt securities:

- issued by, or fully guaranteed by, OECD public sector entities including Canadian public sector entities attracting a 20% risk weight under section 3-5 of Part I of Guideline A;
- issued by, or fully guaranteed by, a multilateral development bank<sup>2</sup>;

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<sup>1</sup> The OECD-based group of countries is defined in section 3-3 of Part I Guideline A, Capital Adequacy Requirements.

<sup>2</sup> Multilateral banks are defined in section 3-4 of Part I of Guideline A, Capital Adequacy Requirements.

- issued by, or fully guaranteed by, Canadian deposit-taking institutions or OECD-banks where the instrument does not qualify as capital of the issuing institution<sup>3</sup>;
- issued by regulated securities firms in Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Sweden, Switzerland, United Kingdom and the United States; and
- rated investment-grade by at least two nationally recognized credit rating services, or rated investment-grade by one nationally recognized credit rating agency and not less than investment-grade by any other credit rating agency.

Nationally recognized credit rating agencies include but are not restricted to:

- Dominion Bond Rating Service (DBRS);
- Canada Bond Rating Service (CBRS);
- Moody's Investor Service (Moody's);
- Standard & Poors (S&P);
- ICBA Banking Analysis (ICBA);
- Japan Credit Rating Agency, LTD (JCR);
- Nippon Investor Services Inc., (NIS); and
- the Japan Bond Research Institute (JBRI).

Table II provides the minimum ratings constituting investment grade for the agencies listed above.

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<sup>3</sup> Government-sponsored agencies, multilateral development banks, and banks are defined in section 3-5, 3-4, and 3-2 respectively of Part I of Guideline A, Capital Adequacy Requirements.

**TABLE II**

**Example Minimum Ratings Comprising Investment Grade**

<b>Rating Agency</b>	<b>Minimum Ratings</b>	
	<b>Securities</b>	<b>Money market</b>
DBRS	BBB low	A-3
CBRS	B++low	R-2
Moody's	Baa3	P-3
S&P	BBB-	A-3
ICBA	BBB-	A-3
JCR	BBB-	J-2
NIS	BBB-	a-3
JBRI	BBB-	A-2

Other

The *other* category includes debt securities not qualifying as government or qualifying securities. This would include non-OECD central government securities that do not meet the criteria for the government or qualifying categories.

*General Market Risk*

Overview

An institution may measure its exposure to general market risk using the *maturity method*, which uses standardized risk weights that approximate the price sensitivity of various instruments.

The maturity method uses a maturity-ladder that incorporates a series of "time-bands" that are divided into maturity "zones" for grouping together securities of similar maturities. These time bands and zones are designed to take into account differences in price sensitivities and interest rate volatilities across different maturities.

A separate maturity ladder must be constructed for each currency in which an institution has significant positions, and capital requirements must be calculated for each currency separately. No offsetting of positions is permitted between different currencies in which positions are significant.

Positions in currencies that are not significant may be combined into a common maturity ladder, with the net long or short position of each currency entered in the applicable time band. The net positions are to be summed within each time band, irrespective of whether they are positive or negative, to arrive at the gross position.

Opposite positions of the same amount in the same issues (but not different issues by the same issuer), whether actual or notional, may be excluded from the interest rate maturity framework, as well as closely matched swaps, forwards, futures, and forward rate agreements (FRAs) that meet the conditions set out in the sub-section on interest rate derivatives in Appendix 2-1-I.

The capital requirement for general market risk, excluding options, is the sum of:

- Basis risk charge
  - Matched weighted positions in all time bands x 10%
- Yield curve risk charge
  - Matched weighted positions in zone 1 x 40%
  - Matched weighted positions in zone 2 x 30%
  - Matched weighted positions in zone 3 x 30%
  - Matched weighted positions between zones 1 and 2 x 40%
  - Matched weighted positions between zones 2 and 3 x 40%
  - Matched weighted positions between zones 1 and 3 x 100%
- Net position charge
  - Residual unmatched weighted positions x 100%

An example of the calculation of general market risk under the maturity method is in Appendix 2-1-II.

General Market Risk Calculation

To calculate the *general market risk* charge, the institution distributes the long or short position (at current market value) of each debt instrument and other source of interest rate exposure, including derivatives, into the time-bands and three zones of the maturity ladder outlined in Table III. Once all long and short positions are placed into the appropriate time-bands, the long positions in each time-band are summed and the short positions in each time-band are summed. The summed positions are multiplied by the appropriate risk-weight factor (reflecting the price sensitivity of the positions to changes in interest rates) to determine the risk-weighted long and short market risk positions for each time-band. The risk weights for each time-band are:

**TABLE III**

**Maturity Method: Zones, Time-bands and Weights**

Zone	Time-bands For Coupon 3% or more	Time-bands For Coupon less than 3% and zero coupon bonds	Risk Weights [%]
1	up to 1 month	up to 1 month	0.00
	1 up to 3 months	1 up to 3 months	0.20
	3 up to 6 months	3 up to 6 months	0.40
	6 up to 12 months	6 up to 12 months	0.70
2	1 up to 2 years	1 up to 1.9 years	1.25
	2 up to 3 years	1.9 up to 2.8 years	1.75
	3 up to 4 years	2.8 up to 3.6 years	2.25
3	4 up to 5 years	3.6 up to 4.3 years	2.75
	5 up to 7 years	4.3 up to 5.7 years	3.25
	7 up to 10 years	5.7 up to 7.3 years	3.75
	10 up to 15 years	7.3 up to 9.3 years	4.50
	15 up to 20 years	9.3 up to 10.6 years	5.25
	over 20 years	10.6 up to 12 years	6.00
		12 up to 20 years over 20 years	8.00 12.50



A capital requirement is calculated for the matched weighted position in each time band to address basis risk. The capital requirement is 10% of the matched weighted position in each time band, that is, 10% of the smaller of the risk-weighted long or risk-weighted short position, or if the positions are equal, 10% of either position.<sup>4</sup> If there is only a gross long or only a gross short position in the time band, a basis risk charge is not calculated. The remainder (i.e., the excess of the weighted long positions over the weighted short positions, or vice versa, within a time band) is called the unmatched weighted position for that time band.

The basis risk charges for each time-band are absolute values, that is, neither long nor short. The charges for all time-bands in the maturity ladder are summed and included as an element of the general market risk capital requirement.

Capital requirements, referred to as the yield curve risk charge, are assessed to allow for the imperfect correlation of interest rates along the yield curve. There are two elements to the yield curve risk charge. The first element is a charge on the matched weighted positions in zones 1, 2 and 3. The second is a capital charge on the matched weighted positions between zones.

The matched weighted position in each zone is multiplied by the percentage risk factor corresponding to the relevant zone. The risk factors for zones 1, 2 and 3 are provided in Table IV. The matched and unmatched weighted positions for each zone are calculated as follows. Where a zone has both unmatched weighted long and short positions for various time bands within a zone, the extent to which the one offsets the other is called the matched weighted position for that zone. The remainder (i.e., the excess of the weighted long positions over the weighted short positions, or vice versa, within a zone) is called the unmatched weighted position for that zone.

The matched weighted positions between zones are multiplied by the percentage risk factor corresponding to the relevant adjacent zones. The risk factors for adjacent offsetting zones are provided in Table IV. To arrive at the matched weighted positions between zones, the unmatched weighted positions of a zone may be offset against positions in other zones as follows.

- (a) The unmatched weighted long (short) position in zone 1 may offset the unmatched weighted short (long) position in zone 2. The extent to which unmatched weighted positions in zones 1 and 2 are offset is described as the matched weighted position between zones 1 and 2.

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<sup>4</sup> For example, if the sum of the weighted longs in a time-band is \$100 million and the sum of the weighted shorts is \$90 million, the basis risk charge for the time-band is 10% of \$90 million, or \$9 million.

- (b) After (a), any residual unmatched weighted long (short) positions in zone 2 may then be matched by offsetting unmatched weighted short (long) positions between zone 2 and zone 3<sup>5</sup>.
- (c) After (a) and (b) any residual unmatched weighted long (short) positions in zone 1 may then be matched by offsetting unmatched weighted long (short) positions in zone 3. The extent to which the unmatched positions in zones 1 and 3 are offsetting is described as the matched weighted positions between zones 1 and 3.

The yield curve risk charges, like the basis risk charges, are absolute values that are summed and included as an element of the general market risk capital requirement.

**TABLE IV**

**Zonal Disallowances**

<b>Zone</b>	<b>Time-Band</b>	<b>Within the zone</b>	<b>Between Adjacent zones</b>	<b>Between zones 1-3</b>
1	0-1 month			
	1-3 months	40%		
	3-6 months			
	6-12 months		40%	
2	1-2 years			
	2-3 years	30%		100%
	3-4 years			
3	4-5 years			
	5-7 years			
	7-10 years	30%	40%	
	10-15 years			
	15-20 years over 20 years			

The net position charge for interest rate position risk in a currency is the absolute value of the sum of the weighted net open positions in each time band.

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<sup>5</sup> For example, if the unmatched weighted position for zone 1 was long \$100 and for zone 2 was short (\$200), the capital charge for the matched weighted position between zone 1 and 2 would be 40% of \$100, or \$40. The residual unmatched weighted position in zone 2 (\$100) also could have been carried over to offset a long position in zone 3 and would have attracted a 40% charge.

**Appendix 2-1-I**

**Position Reporting for General Market Risk Calculations**

***Debt Instruments***

Fixed-rate instruments are allocated according to the remaining term to maturity and floating-rate instruments according to the next repricing date. A callable bond that has a market price above par is slotted according to its first call date, while a callable bond with a market price below par is slotted according to remaining maturity. Mortgage-backed securities are slotted according to their final maturity dates.

***Interest Rate Derivatives***

Debt derivatives and other off-balance sheet positions whose values are affected by changes in interest rates are included in the measurement system described above, except for options and the associated underlying instrument (the measurement system for options is described later). A summary of the treatment for debt derivatives is set out in the following table.

Derivatives are converted into positions in the relevant underlying instrument and are included in the calculation of specific and general market risk capital charges as described above. The amount to be included is the market value of the principal amount of the underlying instrument or of the notional underlying. For instruments where the apparent notional amount differs from the effective notional amount, an institution must use the effective notional amount.

Futures and forward contracts (including FRAs) are broken down into a combination of a long position and short position in the notional security. The maturity of a future or a FRA is the period until delivery or exercise of the contract, plus the life of the underlying instrument.<sup>6</sup> Where a range of instruments may be delivered to fulfil the contract, the institution may choose which deliverable instrument goes into the maturity ladder as the notional underlying instrument. In the case of a future on a corporate bond index, positions are included at the market value of the notional underlying portfolio of securities.

Although an FRA is closely analogous to an interest rate future, the words "buyer" and "seller" when used in reference to FRAs have the opposite meaning to that used in the financial futures market. The "buyer" of an FRA is fixing the interest rate on a deposit that it will receive in the future. Hence, if interest rates rise, the buyer of an FRA receives the difference between the contracted rate and the new (higher) rate from the seller; that is the buyer makes a gain. Thus, a bank wishing to hedge against a rise in interest rates may buy an FRA or sell an interest rate future.

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<sup>6</sup> For example, assuming an April 30 reporting date, a long position in a June three-month bankers acceptance future (BAX) is recorded as a long position maturing in five months and a short position maturing in two months.

**Position Reporting for the Maturity Method**

<b>Instrument Type</b>	<b>First Reporting Leg</b>		<b>Second Reporting Leg</b>	
	<b>Amount</b>	<b>Report According to:</b>	<b>Amount</b>	<b>Report According to:</b>
<u>Interest Rate Swaps:</u>				
Pay Fixed	- NP	Maturity Date	+ NP	Next Settlement Date: Pay
Receive Fixed	+ NP	Maturity Date	- NP	Next Settlement Date: Receive
<u>Forward Rate Agreements:</u>				
Buy (i.e., short)	- NP	Maturity Date	+ NP	Value Date
Sell (i.e., long)	+ NP	Maturity Date	- NP	Value Date
<u>3-month BAX Futures:</u>				
Buy	+ NP	Maturity Date + 3 months	- NP	Maturity Date
Sell	- NP	Maturity Date + 3 months	+ NP	Maturity Date
<u>Gov't Bonds and Notes</u>	+ NP	Maturity Date		
<u>Cross Currency Swaps:</u>				
Received Floating	+ NP	Value Date + Frequency**		
Pay Floating	- NP	Value Date + Frequency**		
Receive Fixed	+ NP	Maturity Date		
Pay Fixed	- NP	Maturity Date		
<u>FX Forwards</u>	+ NP (Buy)	Value Date	- NP (Sell)	Value Date

Notes: NP= Notional principal in relevant currency;

\*\* Starting with the value date, move forward in intervals according to the frequency of payments (e.g., 3M, 6M, or 1 YR)

Swaps are treated as two notional positions in the relevant instruments with appropriate maturities. The receiving side is treated as the long position and the paying side is treated as the short position.<sup>7</sup> The separate sides of cross-currency swaps or forward foreign exchange transactions are slotted in the relevant maturity ladders for the currencies concerned. For swaps that pay or receive a fixed or floating interest rate against some other reference price, for example, an equity index, the interest rate component is slotted into the appropriate repricing maturity category, with the long or short position attributable to the equity component being included in the equity framework set out above.<sup>8</sup>

A institution may offset long and short positions (both actual and notional) in identical derivative instruments with exactly the same issuer, coupon, currency, and maturity before slotting these positions into time-bands. A matched position in a future and its corresponding underlying may also be fully offset and, thus, excluded from the calculation, except when the future comprises a range of deliverable instruments. However, in cases where, among the range of deliverable instruments, there is a readily identifiable underlying instrument that is most profitable for the trader with a short position to deliver, positions in the futures contract and the instrument may be offset. No offsetting is allowed between positions in different currencies.

Offsetting positions in the same category of instruments can in certain circumstances be regarded as matched and treated by the institution as a single net position which should be entered into the appropriate time-band. To qualify for this treatment the positions must be based on the same underlying instrument, be of the same nominal value, and be denominated in the same currency. The separate sides of different swaps may also be "matched" subject to the same conditions. In addition:

- For futures, offsetting positions in the notional or underlying instruments to which the futures contract relates must be for identical instruments and the instruments must mature within seven days of each other;
- For swaps and FRAs, the reference rate (for floating rate positions) must be identical and the coupon closely matched (i.e., within 15 basis points); and

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<sup>7</sup> For example, an interest rate swap under which an institution is receiving floating-rate interest and paying fixed is treated as a long position in a floating rate instrument with a maturity equivalent to the period until the next interest reset date and a short position in a fixed-rate instrument with a maturity equivalent to the remaining life of the swap.

<sup>8</sup> An institution with a large swap book may, subject to review by OSFI, use alternative formulae to calculate the positions to be included in the maturity ladder. For example, an institution could first convert the payments required by the swap into present values. For that purpose, each payment would be discounted using zero coupon yields, and the payment's present value entered into the appropriate time-band using procedures that apply to zero (or low) coupon bonds. The net amounts would then be treated as bonds, and slotted into the general market risk framework. Such alternative treatments will, however, only be allowed if: (i) OSFI is fully satisfied with the accuracy of the system being used, (ii) the positions calculated fully reflect the sensitivity of the cash flows to interest rate changes; and (iii) the positions are denominated in the same currency.

- For swaps, FRAs and forwards, the next interest reset date, or for fixed coupon positions or forwards the remaining maturity, must correspond within the following limits: If the reset (remaining maturity) dates occur within one month, then the reset dates must be on the same day; if the reset dates occur between one month and one year later, then the reset dates must occur within seven days of each other, or if the reset dates occur over one year later, then the reset dates must occur within thirty days of each other.

Interest rate and currency swaps, FRAs, forward foreign exchange contracts and interest rate futures are not subject to a specific risk charge. This exemption also applies to futures on a short-term (e.g., 3-month Bankers Acceptance rate) interest rate index. However, in the case of futures contracts where the underlying is a debt security, or an index representing a basket of debt securities, a specific risk charge will apply according to the category of the issuer.

Appendix 2-1-II

**Sample Steps to the Calculation of General Market Risk  
for Debt Instruments using the Maturity Method**

A hypothetical institution has the following given positions designated as trading:

- A Qualifying bond, \$13.33 million market value, remaining maturity 8 years, coupon 8%;
- B Government bond, \$75 million market value, remaining maturity 2 months, coupon 7%;
- C Interest rate swap, \$150 million, institution receives floating rate interest and pays fixed, next interest reset after 12 months, remaining life of swap is 8 years (assumes the current interest rate is identical to the one the swap is based on); and
- D Long position in interest rate future, \$50 million, delivery date after 6 months, life of underlying government security is 3.5 years (assumes the current interest rate is identical to the one on which the swap is based).

The institution would record these instruments as positions in a maturity ladder as shown below:

Zone	Time-band	Position for Instruments: in \$ millions				Risk Weights [%]	Risk Weighted Long Positions \$ millions	Risk Weighted (Short) Positions \$ millions
		A	B	C	D			
1	0-1 mth	\$75				0.00	0.15	(0.20)
	1-3 mth					(\$50)		
	3-6 mth	0.40						
	6-12 mth	\$150	0.70	1.05				
2	1-2 years	\$50				1.25	1.125	
	2-3 years					1.75		
	3-4 years					2.25		
3	4-5 years	\$13.33 (\$150)				2.75	0.50	(5.625)
	5-7 years					3.25		
	7-10 years					3.75		
	10-15 years					4.50		
	15-20 years					5.25		
	>20 years					6.00		

Each position would be multiplied by the risk weight corresponding to the time band in which it is recorded. The risk-weighted long and risk weighted short positions in each maturity band are the basis of calculating the general market risk capital charges.

The first step in the process of calculating general market risk is to calculate a 10% basis risk charge on the matched weighted position in each time band. In this example there are partially offsetting long and short positions in the 7-10 year time-band, the matched portion of which is equal to \$500,000 (i.e., 0.50 million). Ten percent of this matched portion is equal to \$50,000 [ $0.10 \times 0.50 = 0.05$  (\$50,000)].

**In \$ millions**

Zone	Time-band	Risk Weighted Long Positions	Risk Weighted (Short) Positions	Unmatched Weighted Position	Step 1 10% Basis risk charge
1	0-1 mth	0.15	(0.20)	0.15	n/a
	1-3 mth				
	3-6 mth	(0.20)		n/a	
	6-12 mth	1.05		1.05	n/a
2	1-2 years	1.125		1.125	n/a
	2-3 years				
	3-4 years				
3	4-5 years	0.50	(5.625)	(5.125)	0.050
	5-7 years				
	7-10 years				
	10-15 years				
	15-20 years				
	>20 years				
<b>TOTAL</b>					<b>0.05</b>



Step 2 requires the calculation of the yield curve risk charge. The yield curve risk charge is calculated on the matched weighted position in each zone using the percentage risk factors in Table IV. In this example, a charge would be calculated for zone 1 (step 2(a)). It would be 40 % of the total offsetting in the zone --  $40\% \times 0.20 = 0.08$  (\$80,000). No charge is required if offsetting does not occur within a zone.

Zone	Time-band	Unmatched Weighted Positions	Step 2(a) 30% to 40% of Matched weighted Zone position	Step 2(b) 40% to 100% Matched between Zones
1	0-1 mth	0.15 (0.20) 1.05		
	1-3 mth			
	3-6 mth			
	6-12 mth			
Zone 1 totals		long 1.20 short (0.20) unmatched 1.00	<b>0.08</b> = $0.20 \times 40\%$	n/a [Zone 1 & 2 net totals are both long]
2	1-2 years	1.125		
	2-3 years			
	3-4 years			
Zone 2 totals		long 1.125	n/a	<b>0.45</b> = $40\% \times$ the lesser of 1.125 and 5.125 Charge on the offsetting between Zone 2 (long) and Zone 3 (short)]
3	4-5 years	(5.125)		
	5-7 years			
	7-10 years			
	10-15 years			
	15-20 years			
	>20 years			
Zone 3 total		short (5.125)	n/a	<b>1.0</b> = $100\% \times 1.00$ [Charge on the offsetting between Zone 1 and Zone 3]

In step 2(b) the yield curve risk charges on matching between residual unmatched weighted positions in the three zones are calculated. Zone 1 and zone 2 are offset, if possible, reducing or eliminating the unmatched weighted positions in zone 1 and zone 2 as appropriate. Zone 2 and zone 3 are then offset, if possible, reducing or eliminating the unmatched weighted position in zone 2 or zone 3 as appropriate. Zone 3 and zone 1 are then offset, if possible, reducing or eliminating the unmatched weighted position in zone 3 and zone 1 as appropriate. A capital requirement is calculated as a percentage of the position eliminated by the inter-zone offsetting.

In the example, a charge would be calculated for adjacent zones 2 and 3 (step 3). It would be 40 % of the matched weighted positions between the zones --  $40\% \times 1.125 = 0.45$  (\$450,000).

A charge would be calculated between zones 1 and 3 (step 3). It would be 100 % of the matched positions between the zones --  $100\% \times 1.00 = 1.00$  (\$1,000,000).

Step 3 calculates a net position charge equal to the residual unmatched weighted position. In this example this amounts to \$3 million [being the absolute value of the sum of  $0.15 - .20 + 1.05 + 1.125 - 5.125 = -3.00$ ] and would be included as the net position charge for general market risk.

The total capital requirement for general market risk for this portfolio would be:

1. Basis risk charge

Σ	Matched weighted positions in all time bands	50,000
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2. Yield curve risk charge

Σ	Matched weighted positions in zone 1	80,000
Σ	Matched weighted positions in zone 2	n/a
Σ	Matched weighted positions in zone 3	n/a
Σ	Matched weighted positions between zones 1 and 2	n/a
Σ	Matched weighted positions between zones 2 and 3	450,000
Σ	Matched weighted positions between zones 1 and 3	1,000,000

3. Net position charge

Σ	Residual unmatched weighted positions	<u>3,000,000</u>
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TOTAL GENERAL MARKET RISK	<u>\$4,580,000</u>
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Appendix 2-1-III

Summary of Specific and General Market Risk Charges for Interest Rate Derivatives

INSTRUMENT	SPECIFIC RISK CHARGE (Relating to the issuer of the instrument. There remains a separate capital requirement for counterparty credit risk.)	GENERAL MARKET RISK CHARGE
<b>EXCHANGE-TRADED FUTURE</b>		
Government security	No	Yes, as two positions
Corporate debt security	Yes	Yes, as two positions
Index on short-term interest rates (e.g., Bankers Acceptances)	No	Yes, as two positions
<b>OTC FORWARD</b>		
Government security	No	Yes, as two positions
Corporate debt security	Yes	Yes, as two positions
Index on short-term interest rates	No	Yes, as two positions
FRAs, Swaps	No	Yes, as two positions
Forward foreign exchange	No	Yes, as one position in each currency
<i>Options</i>		For each type of transaction, either:
Government security	No	Carve out together with the associated hedging positions - simplified approach - scenario analysis - internal models
Corporate debt security	Yes	Same as above
Index on short-term interest rates	No	Same as above

### *Equities Risk*

This section sets out the minimum capital associated with an institution's risk of holding or taking positions in equities within the trading book. An institution which holds equity positions (whether long or short) in the trading book is exposed to the risk that the value of individual equity positions relative to the market may move against the institution - specific risk- and that the equity market as a whole may move against it - general risk. The specific risk requirements recognize that individual equities are subject to issuer risk and liquidity risk, and that these risks may be reduced by portfolio diversification. The general risk requirements set out in this section recognize offsetting positions within national markets. A separate subsection for equity derivatives positions outlines the method for including them in the capital calculation.

Equity risk capital requirements will apply to positions and exposures in the trading book on the following instruments:

- common shares;
- convertible preference shares or securities
- convertible debt securities which convert into equity instruments and are trading as equities;<sup>9</sup>
- depository receipts;
- any other instruments exhibiting equity characteristics; and
- equity derivatives or derivatives based on above securities.

Non-convertible preference shares are to be excluded from these calculations as they are covered by the interest rate risk requirements described in section 2-1.

Equity positions should be allocated to the country in which each equity is listed and the calculations outlined below applied to each country. Equity securities listed in more than one country must be allocated to either (i) the country where the issuer is incorporated and listed or, (ii) the country where the security was purchased or sold, but not both. Switching between countries is not allowed and any foreign exchange position resulting from a long or short position in an equity listed in a country other than Canada must be included in the calculation of the foreign exchange risk capital requirement. Conversion into the institution's reporting currency should be done at current spot foreign exchange rates.

Matched positions in each identical equity or stock index in each country may be fully offset, resulting in a single net short or long position to which the specific and general market risk charges will apply.

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<sup>9</sup> See section 2-1-1 for the definition of when a convertible security is trading like an equity.

### *Specific Risk*

The measurement of specific risk capital requirements is calculated on the basis of the institution's gross equity positions. The gross position is the sum of the absolute value of all short equity positions and all long equity positions, including positions arising from derivatives, calculated at the current market value. Long and short positions in the same share issue may be reported on a net basis. The specific risk capital requirement is 8% of this sum. However, if the portfolio is both liquid and well-diversified (defined below) the specific risk capital requirement may be 4% of the gross equity position.

### Liquid and Well Diversified Portfolio

A portfolio that is liquid and well-diversified is characterized by a limited sensitivity to price changes of any single equity issue or closely related group of equity issues held in the portfolio. The volatility of the portfolio's value should not be dominated by the volatility of any individual equity issue or by equity issues from any single industry or economic sector.

Individual equities included in the indices listed in "Table I - Market Indices" are considered to be liquid. OSFI will review the list from time to time and amend it accordingly.

**TABLE I - MARKET INDICES**

Australia	All Ordinaries	Netherlands	EOE 25
Austria	ATX	Spain	IBEX 35
Belgium	BEL 20	Sweden	OMX
Canada	TSE 35 & 100	Switzerland	SMI
France	CAC 40	United Kingdom	FTSE 100
Germany	DAX	United Kingdom	FTSE mid-250
Japan	Nikkei 225	United States	S&P 500

A portfolio of liquid equities will be considered to be well diversified if the following requirements are met:

- no individual liquid equity position comprises more than 10% of the gross value of the institution's portfolio of equities traded on the markets in each particular country (the "country portfolio"); and
- the portfolio is comprised of 15 or more securities not concentrated in any one market sector.

#### *General Market Risk*

To calculate general market risk long and short positions in equity instruments are offset to arrive at a net position. Instruments are valued at current market and a net position must be separately calculated for each country in which the institution holds equity instruments. The capital requirement for general market risk is 8% of the net position for each country.

#### *Equity Derivatives*

Equity derivatives and other off-balance sheet positions that are affected by changes in equity prices are included in the measurement system (except for equity options, equity index options, and the associated underlying).<sup>9</sup> This includes futures and swaps on both individual equities and on equity indices. Equity derivatives should be converted into notional equity positions in the relevant underlying instrument. A summary of the rules for equity derivatives is set out in Appendix 2-2-I.

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<sup>9</sup> Where equities are part of a forward contract (both equities to be received or to be delivered), any interest rate or foreign currency exposure from the other side of the contract should be included in the measurement systems in sections 2-1 or 2-3, as appropriate.

### Calculation of Positions

In order to calculate the specific and general market risk, positions in derivatives should be converted into notional equity positions as follows:

- futures and forward contracts relating to individual equities should be reported at current market price of the underlying;
- futures relating to stock indices should be reported as the marked-to-market value of the notional underlying equity portfolio;
- equity swaps are to be treated as two notional positions; and
- equity options should be carved out together with the associated underlyings and treated under section 2-5 of this guideline.

### Risk in Relation to an Index

A specific risk capital charge of 2% applies to the net long or short position in a contract on an index listed in Table 1 above. This capital charge is intended to cover factors such as divergence from the general market level and execution risk. The 2% risk weight is to apply only to well diversified indices and not, for example, to sectoral indices. Positions in indices not listed in Table 1 must either be decomposed into their component shares, or be treated as a single position based on the sum of current market values of the underlying instruments; if treated as a single position, the specific risk requirement is the highest specific risk charge which would apply to any of the index's constituent shares. An institution's position in an index contract is also subject to an 8% general market risk charge.

### Futures Arbitrage

In the case of futures-related arbitrage strategies, the 2% specific risk charge described above may be applied to only one index with the opposite position exempt from a capital charge (both the specific and general market risk capital charges). The strategies qualifying for this treatment are:

- when the institution takes an opposite position in exactly the same index future at different dates; and
- when the institution has an opposite position in different but similar indices at the same date, subject to supervisory oversight.

If an institution engages in a deliberate arbitrage strategy, in which a futures contract on a well diversified equity index matches a basket of securities, it may exclude both positions from their respective specific and general risk charges on condition that the trade has been deliberately entered into and separately controlled and the composition of the basket of stocks represents at least 90% of the market value of the index.

In such a case, there will be a minimum capital requirement of 4% (that is, 2% of the gross value of the positions on each side) to reflect risk associated with executing the transaction. This applies even if all of the securities comprising the index are held in identical proportions. Any excess value of the securities comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket is treated as an open long or short position.



Appendix 2-2-I

Summary of Treatment for Equity Derivatives

INSTRUMENT	SPECIFIC RISK (relating to the issuer of the instrument. There remains a separate capital requirement for counterparty credit risk)	GENERAL MARKET RISK
<b>FUTURES, SWAPS, &amp; SIMILAR OTC CONTRACTS</b>		
Individual equity	Yes	Yes, as underlying
Index	2.0%	Yes, as underlying
<b>OPTIONS</b>		
Individual equity	Yes	Carve out from equity position risk framework together with the associated hedging positions and apply: - simplified approach; or - scenario approach; or - internal models.
Index	2.0%	

### *Foreign Exchange Position Risk*

This section sets out a shorthand method for calculating the minimum capital required to cover the risk of holding or taking a position in foreign currencies including gold. Institution's with significant foreign exchange positions are encouraged to use internal models.

The capital requirement for foreign exchange risk is applied to the entire business, both the trading and non-trading books. Two steps are required to calculate the capital requirement for foreign exchange risk. The first is to measure the exposure in a single currency position. The second is to calculate the capital requirement for the portfolio of positions in different currencies. In summary, the capital charge is 8% of the greater of the sum of (i) the net open long positions or (ii) the net open short positions in each currency, plus the net open position in gold, whatever the sign.<sup>11</sup>

#### *Measuring the Exposure in a Single Currency*

The net open position for each individual currency (and gold) is calculated by summing:

- the net spot position (i.e., all asset items less all liability items, including accrued interest and accrued expenses, denominated in the currency in question);
- the net forward position (i.e., all net amounts under forward foreign exchange transactions, including currency futures and the principal on currency swaps);
- guarantees (and similar instruments) that are certain to be called and are likely to be irrecoverable;
- net future income/expenses not yet accrued but already fully hedged (at the discretion of the reporting institution); and
- any other item representing a profit or loss in foreign currencies.

Options on foreign exchange are treated separately; see section 2-5 of this guideline.

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<sup>11</sup> Gold is treated as a foreign exchange position rather than a commodity because its volatility is more in line with foreign currencies and institutions manage it in a manner similar to foreign currencies.

### Treatment of Composite Currencies

For measuring an institution's open positions, positions in composite currencies, such as the ECU, may be treated either as a currency in their own right or split into their component parts. Institutions must be consistent in their treatment of composite currencies.

### Treatment of Immaterial Operations

Foreign exchange risk is assessed on a consolidated basis. It may be technically impractical in the case of immaterial operations to include some currency positions. In such cases, the internal limit in each currency may be used as a proxy for the positions, provided there is adequate ex post monitoring of actual positions complying with such limits. In these circumstances, the limits should be added, regardless of sign, to the net open position in each currency.

### Measurement of Forward Currency Positions

Forward currency positions should be valued at current spot market exchange rates. It would be inappropriate to use forward exchange rates since to some extent they reflect current interest rate differentials. Institutions which base their normal management accounting on net present values are expected to use the net present values of each position, discounted using current interest rates and translated at current spot rates, for measuring their forward currency and gold positions.

### Accrued and Unearned Interest, Income and Expenses

Accrued interest, accrued income and accrued expenses should be treated as a position if they are subject to exchange rate fluctuations. Unearned but expected future interest, income or expenses may be included provided the amounts are certain and have been fully hedged by forward foreign exchange contracts. Institutions must be consistent in their treatment of unearned interest, income and expenses and the institution must have written policies covering the treatment. The selection of positions that are only beneficial to reducing the overall position will not be permitted.

### Structural Positions

Structural positions and related hedges will be exempt from the calculation of net open currency positions. Structural positions may include any of the following:

- any position arising from an instrument which qualifies to be included in an institution's capital base;
- any position entered into in relation to the net investment of a capital nature in foreign operation, the accounting consequence of which is to reduce or eliminate what would otherwise be a movement in the foreign currency translation reserve; and
- investments in foreign operations which are fully deducted from an institution's capital for capital adequacy purposes.

### *Calculating the Capital Requirement for the Portfolio*

The nominal amount (or net present value) of the net open position in each foreign currency (and gold) is converted at spot rates into Canadian dollars. The capital charge is 8% of the overall net open position calculated as the sum of:

- the greater of the sum of the net open short positions or the sum of the net open long positions (absolute values); and
- the net open position in gold, either long or short, regardless of sign.

### *Foreign Exchange De Minimus Criteria*

An institution doing negligible business in foreign currency and that does not take foreign exchange positions for its own account may be exempted from the capital requirement for foreign exchange risk provided that:

- its foreign currency business, defined as the greater of the sum of its gross long positions and the sum of its gross short positions in all foreign currencies, does not exceed 100% of eligible capital; and
- its overall net open foreign exchange position does not exceed 2% of its eligible capital.

**Appendix 2-3-I**

**Example of the Shorthand Measure of Foreign Exchange Risk.**

Institution A has the following net currency positions. These open positions have been converted at spot rates to the reporting currency, in this case Canadian dollars, (+) signifies a long position and (-) signifies a short position.

**Table I**

<b>YEN</b>	<b>DM</b>	<b>GB,</b>	<b>FFR</b>	<b>US\$</b>	<b>GOLD</b>
+50	+100	+150	-20	-180	-35
+300			-200		-35

In this example the institution has three currencies to which it has long positions, these being the Japanese Yen, the German Mark and the British Pound, and two currencies to which it has a short position, the French Franc and the U.S. Dollar. The middle line of the above chart shows the net open positions in each of the currencies. The sum of the long positions is +300. The sum of the short positions is -200.

The foreign exchange market risk is calculated using the higher of the summed absolute values of either the net long or short positions, and the absolute value for the position in gold. The capital charge is 8%. In this example, the total long position (300) would be added to the gold position (35) to give an aggregate position of 335. The aggregated amount multiplied by 8% would result in a capital charge of \$26.80.

### *Commodities Risk*

This section provides a minimum capital requirement to cover the market risk of holding or taking positions in commodities including precious metals but excluding gold (gold is treated as a foreign currency). Institutions conducting a limited amount of commodities business may use the simplified measurement method that is comprised of a capital charge on the net and gross position in each category of commodity. This method is set out below. All other institutions must adopt an internal model system that conforms to criteria set out under Tab 3.

#### *Net Position Requirement*

Under the simplified method, each long and short commodity position (spot and forward) is expressed in terms of the standard unit of measurement (such as barrels, kilos, or grams). The open positions in each category<sup>12</sup> of commodities are then converted at current spot rates into Canadian dollars, with long and short positions offset to arrive at the net open position in each commodity. Positions in different categories of commodities may not be offset. The base capital requirement is 15% of the net open position, long or short, in each commodity.<sup>13</sup>

#### *Gross Position Requirement*

To protect an institution against basis risk, interest rate risk, and forward gap risk, each category of commodity is also subject to a 3% capital requirement on the institution's gross positions, long plus short, in the particular commodity.

#### *Calculation of Positions*

Commodity derivatives and other off-balance-sheet positions that are affected by changes in commodity prices are included in the measurement system (except for options and the associated underlying instrument - refer to section 2-5 for a description of their treatment). Commodity derivatives are converted into notional commodity positions using the current spot price.

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<sup>12</sup> Commodities that are deliverable against each other or that are close substitutes with a minimum correlation of ninety percent between price movements are considered to be part of the same category.

<sup>13</sup> When the funding of a commodity position opens an institution to interest rate or foreign exchange exposure the relevant positions should be included in the measures of interest rate and foreign exchange risk described in sections 2-1 and 2-2. When a commodity is part of a forward contract, any interest or foreign currency exposure from the other side of the contract should be appropriately included in the measurement systems in sections 2-1 and 2-2.

### *Options*

Options contracts and related hedging positions in the associated underlying instrument, commodity or index, cash or forward, are subject to capital requirements as calculated in this section.

The capital requirements calculated under this section should then be added to the capital requirements for debt securities, equities, foreign exchange, and commodities risk as appropriate.

Two alternatives to measuring the market risk for options activities are available under the standardized approach:

- those institutions which solely use purchased options may use the *simplified method* ;
- those institutions which also write options must use the *scenario method*.<sup>14</sup>

The more significant an institution's trading in options, the more sophisticated the approach an institution will be expected to use. Institutions doing business in certain classes of exotic options (e.g., barriers and digitals) may be required to use the internal models alternative as set out under tab 3.

Regardless of the method used, specific risk related to the issuer of an instrument still applies to options positions for equities, equity indices and corporate debt securities.

In addition to these market risk charges, purchased options remain subject to the credit risk capital requirements specified in Part I of Guideline A, Capital Adequacy Requirements.

#### *Simplified method*

An institution that has only a limited amount and range of purchased options may use the simplified method set out in Table I for individual options positions. These options positions are subject to the separate capital charges specified in Table I and are not included in the standardized calculation of specific and general market risk specified in the preceding sections. A charge must be calculated for each individual option in which the institution has a position.

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<sup>14</sup> Unless all their written option positions are hedged by perfectly matched long positions in exactly the same options, in which case there is no capital requirement for market risk.





### *Scenario Method*

Under the scenario method, an institution is required to make separate calculations of the specific risk and general market risk of options and their related hedging positions. Specific risk charges must be calculated on each issue in which the institution has a net option position that is subject to interest rate risk or to equity risk. General risk charges are calculated on portfolios of options (groupings are set out below).

The scenario method uses simulation techniques to calculate changes in the value of an options portfolio for changes in the level and volatility of the prices of its associated underlying instruments. Under this approach, the general market risk charge is determined by the scenario "matrix" (i.e., the specified combination of underlying and volatility changes) that produces the largest loss. The total general market risk capital requirement for all option portfolios is the sum of the largest losses of individual option portfolios.

In addition to the general market risk of its interest rate and equity options portfolios, institutions using the scenario method are required to calculate the specific risk of these options using the same basic methodology in the preceding sections on interest rate position risk and equity risk.

#### Calculating the General Market Risk

An institution constructs a two-dimensional matrix for each of its options portfolios. Options portfolios include options and any related hedging positions grouped together as follows:

- for interest rates, options on underlying instruments whose residual maturity is bounded by one of at least six groups of time bands from Table II of this section where no more than three contiguous time bands are grouped together;
- for equities and equity indices, each national market;
- for foreign currencies and gold, each currency pair and gold and;
- for commodities, each individual commodity.

The first dimension of each matrix requires the institution to evaluate the portfolio over a specified range above and below the current value of the underlying instrument, commodity, or index. For interest rates the range is consistent with the assumed changes in yield for the time bands in Table II. Institutions should use the highest of the assumed changes in yield applicable to the time bands that it groups together. The time bands and assumed changes in yield are:

**Table II**

Time band	Assumed changes in yield	Time band	Assumed changes in yield
up to 1 month	1.00	3 up to 4 years	0.75
1 up to 3 months	1.00	4 up to 5 years	0.75
3 up to 6 months	1.00	5 up to 7 years	0.70
6 up to 12 months	1.00	7 up to 10 years	0.65
1 up to 2 years	0.90	10 up to 15 years	0.60
2 up to 3 years	0.80	15 up to 20 years	0.60
		over 20 years	0.60

The other ranges are  $\pm 8$  per cent for equities,  $\pm 8$  per cent for foreign exchange and gold, and  $\pm 15$  per cent for commodities.

For all option portfolios, at least seven observations (including the current observation) should be used to divide the range into equally spaced intervals.

The second dimension of the matrix entails a change in the volatility of the underlying rate or price equal to  $\pm 25$  per cent of the current volatility.<sup>19</sup>

The application of the scenario method, particularly regarding the precise way the analysis is constructed, will be subject to review by OSFI. An institution using the scenario method should meet the appropriate qualitative standards set forth in the section on the internal models approach.

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<sup>19</sup> For example, if the underlying of an equity instrument has a current market value of \$100 and a volatility of 20%, the first dimension of the grid would range from \$92 to \$108, divided into eight intervals of \$2.00 and the second dimension would assume volatility stays at 20%, increases to 25% ( $20\% + (.20 \times .25)$ ) and decreases to 15% ( $20\% - (.20 \times .25)$ ).

Calculating the Specific Risk of Options on Debt and Equity Securities

The specific risk charge for options on debt securities is calculated by multiplying the market value of the effective notional amount of the debt instrument that underlies an option by:

- the option's delta; and
- by the specific risk factors in Table I of Section 2-1 that correspond to the category and residual term of the underlying debt instrument.

The specific risk charge for options on equity securities and options on an equity index is calculated by multiplying the market value of the effective notional amount of the equity instrument or equity index that underlies an option by:

- the option's delta; and

then by:

- 8%; or
- 4% if the portfolio of equities and equity derivatives including options is both liquid and well-diversified as defined in section 2-2 on equities risk; or
- 2% if the option is based on an index of equities.

The effective notional amount of an option is the market value of the stated underlying debt or equity instrument or equity index adjusted to reflect any multiplier applicable to the contract's reference rate(s) or, where there is no multiplier component, simply, the market value of the stated underlying debt or equity instrument or the notional amount underlying an option on an equity index.

Appendix 2-5-I

Example of Options Scenario Matrices

A hypothetical institution has purchased and sold options on Canadian interest rates, and options to purchase and sell U.S. dollars with Canadian funds. The institution might use the scenario approach to calculate the general market risk of these options portfolios by calculating the following matrices.

1) Options on instruments maturing up to 3 months

Yield	- 100	- 66	- 33	Current	+ 33	+ 66	+ 100
	basis	basis	basis	yield	basis	basis	basis
	points	points	points		points	points	points
Volatility							
+ 25%	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss
Current % volatility	gain/loss	gain/loss	gain/loss	market value	gain/loss	gain/loss	gain/loss
- 25%	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss

Repeat the interest rate matrix above for each of the following:

Group of maturity bands

Assumed yield changes in basis points

2) 3 up to 6 months	100
3) 6 up to 12 months	100
4) 1 up to 4 years	90
5) 4 up to 10 years	75
6) 10 years and over	60

7) Options on Canada/U.S. dollar exchange rate

Exchange				Current			
rate	- 8%	- 5.33%	- 2.67%	exchange	+2.67%	+5.33%	+8%
				rate			
Volatility							
+ 25%	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss
Current % volatility	gain/loss	gain/loss	gain/loss	market value	gain/loss	gain/loss	gain/loss
- 25%	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss	gain/loss

**Models**

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Qualitative Standards ..... 3-2

Specification of Market Risk Factors ..... 3-3

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Model Validation..... 3-7

Combination of Internal Models and  
The Standardized Methodology ..... 3-8

### *General Criteria*

The use of an internal model will be conditional upon the explicit approval of OSFI. OSFI will only give its approval if at a minimum:

- it is satisfied that the institution's risk management system is conceptually sound and is implemented with integrity;
- the institutions has sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit, and if necessary, back office areas;
- the institution's models have in OSFI's judgement a proven track record of reasonable accuracy in measuring risk; and
- the institution regularly conducts stress tests along the lines indicated in section 3-5.

The institution must be able to satisfy OSFI that the period of initial monitoring and live testing of a its internal model is satisfactory before the model can be used for capital purposes.

Each institution must meet, on a daily basis, a capital requirement expressed as the higher of:

- the previous day's value-at-risk number measured according to the parameters specified in this section, and
- an average of the daily value-at-risk measures on each of the preceding 60 business days multiplied by 3.

OSFI may require institutions to add to this factor a "plus" directly related to the ex-post performance of the model, or to any transitional arrangements for the combination of an internal model and the standardized methodology. The plus factor that is linked to the performance of the model shall be derived from the outcome of "back-testing" and be zero when such results are satisfactory. Unsatisfactory results shall be determined using the approach applied to backtesting contained in the document, *Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements*, issued by the Basle Committee on Banking Supervision in April 1996. The plus factor for transitional arrangements shall be determined by the Superintendent on a case by case basis with reference to the relevant material circumstances (see sections 3-2-1 and 3-8-2)

In addition to these general criteria, institutions using internal models for capital purposes will be subject to the requirements detailed in sections 3-2 to 3-8.

### *Qualitative Standards*

Institutions must ensure that the models they are using are supported by market risk management systems that are conceptually sound and implemented with integrity. Set out below are qualitative criteria that institutions would have to meet before they are permitted to use a models-based approach. Only those institutions whose models are in full compliance with the qualitative criteria will be eligible for application of the minimum multiplication factor (see section 3-4).

The qualitative criteria include:

- (a) The institution should have an independent risk control unit that is responsible for the design and implementation of the institution's risk management system. The unit should produce and analyze daily reports on the output of the institution's risk measurement model, including an evaluation of the relationship between measures of risk exposure and trading limits. This unit must be independent from business trading units and should report directly to senior management of the institution.
- (b) The unit must conduct a regular back-testing program, i.e., an ex post comparison of the risk measure generated by the model against actual daily changes in portfolio value over longer periods of time. Initially, the unit should make these comparisons using actual next-day portfolio profits and losses. Over time, they are expected to develop the ability to make comparisons against changes in value based on static positions. Where backtesting is based on comparisons against static positions, institutions should still track daily portfolio profits and losses to assure a strong understanding of the link between calculated measures of risk and trading outcomes. The back-testing program should be applied as appropriate to the aggregate risks measured by the models as well as on an individual book level that corresponds to the structure of VaR limits and disaggregated profit and loss information.
- (c) Board of directors and senior management should be actively involved in the risk control process and must regard risk control as an essential aspect of its business to which significant resources need to be devoted. In this regard, the daily reports prepared by the independent risk control unit must be reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual traders and reductions in the institution's overall risk exposure.
- (d) The institution's internal risk measurement model must be closely integrated into the day-to-day risk management process of the institution. Its output should accordingly be an integral part of the process of planning, monitoring and controlling the institution's market risk profile.

- (e) The risk measurement system should be used in conjunction with internal trading and exposure limits. While trading limits for individual dealers do not need to be explicitly stated in terms of value-at-risk, trading limits should be related to the institution's risk measurement model in a manner that is consistent over time and that is well understood by both traders and senior management.
- (f) A routine and rigorous program of stress testing should be in place as a supplement to the risk analysis based on the day-to-day output of the institution's risk measurement model. The results of stress testing should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors. Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps should be taken to manage those risks appropriately.
- (g) Institutions should have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the risk measurement system. The institution's risk measurement system must be well documented, for example through a risk management manual that describes the basic principles of the risk management system and that provides an explanation of the empirical techniques used to measure market risk.
- (h) An independent review of the risk measurement system should be carried out regularly in the institution's own internal auditing process. This review should include both the activities of the business trading units and of the independent risk control unit. A review of the overall risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:
- the adequacy of the documentation of the risk management system and process;
  - the organization of the risk control unit;
  - the integration of market risk measures into daily risk management;
  - the approval process for risk pricing models and valuation systems used by front and back-office personnel;
  - the validation of any significant change in the risk measurement process;
  - the scope of market risks captured by the risk measurement model;
  - the integrity of the management information system;



- the accuracy and completeness of position data;
- the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;
- the accuracy and appropriateness of volatility and correlation assumptions;
- the accuracy of valuation and risk factor calculations; and
- the verification of the model's accuracy through frequent back-testing as described in (b) above.

### *Specification of Market Risk Factors*

An important part of an institution's internal market risk measurement system is the specification of an appropriate set of market risk factors, i.e., the market rates and prices that affect the value of the institution's trading positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the institution's portfolio of on- and off-balance sheet trading positions. In specifying the risk factors for their internal models, institutions should meet the guidelines set out below:

#### *Interest rates*

- There must be a set of risk factors corresponding to interest rates in each currency in which the institution has interest-rate-sensitive on- or off-balance sheet positions.
- The risk measurement system should model the yield curve using one of a number of generally accepted approaches, for example by estimating forward rates of zero coupon yields. The yield curve should be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. For material exposures to interest rate movements in the major currencies and markets, institutions must model the yield curve using a minimum of six risk factors. However, the number of risk factors used should ultimately be driven by the nature of the institution's trading strategies. For instance, an institution with a portfolio of various types of securities across many points of the yield curve and that engages in complex arbitrage strategies would require a greater number of risk factors to capture interest rate risk accurately.
- The risk measurement system must incorporate separate risk factors to capture spread risk (e.g., between bonds and swaps). A variety of approaches may be used to capture the spread risk arising from less than perfectly correlated movements between government and other fixed-income interest rates, such as specifying a completely separate yield curve for non-government fixed-income instruments (for instance, swaps or municipal securities) or estimating the spread over government rates at various points along the yield curve.

### *Exchange Rates*

- The risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which the institution's positions are denominated. Since the value-at-risk figure calculated by the risk measurement system will be expressed in the institution's domestic currency, any net position denominated in a foreign currency will introduce a foreign exchange risk. Thus, there must be risk factors corresponding to the exchange rate between the domestic currency and each foreign currency in which the institution has a significant exposure.

### *Equity Prices*

- There should be risk factors corresponding to each of the equity markets in which the institution holds significant positions.
- At a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (e.g., a market index). Positions in individual securities or in sector indices could be expressed in "beta-equivalents"<sup>1</sup> relative to this market-wide index.
- A somewhat more detailed approach would be to have risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual stocks within each sector could be expressed in beta-equivalents<sup>1</sup> relative to the sector index.
- The most extensive approach would be to have risk factors corresponding to the volatility of individual equity issues.
- The sophistication and nature of the modelling technique for a given market should correspond to the institution's exposure to the overall market as well as its concentration in individual equity issues in that market.

### *Commodity Prices*

- There should be risk factors corresponding to each of the commodity markets in which the institution holds significant positions.

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<sup>1</sup> A "beta-equivalent" position would be calculated from a market model of equity price returns (such as the CAPM model) by regressing the return on the individual stock or sector index on the risk-free rate of return and the return on the market index.

- For institutions with relatively limited positions in commodity-based instruments, a straightforward specification of risk factors would be acceptable. Such a specification would likely entail one risk factor for each commodity price to which the institution is exposed. In cases where the aggregate positions are quite small, it might be acceptable to use a single risk factor for a relatively broad class of commodities (for instance, a single risk factor for all types of oil).
- For more active trading the model should encompass:
  - directional risk, to capture the exposure from changes in spot prices arising from net open positions;
  - forward gap and interest rate risk, to capture the exposure to changes in forward prices arising from maturity mismatches;
  - basis risk, to capture the exposure to changes in the price relationships between two similar, but not identical, commodities; and
  - the model must also take account of variation in the "convenience yield"<sup>2</sup> between derivatives positions, such as forwards and swaps, and cash positions in the commodity.

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<sup>2</sup> The convenience yield reflects the benefits from direct ownership of the physical commodity (for example, the ability to profit from temporary market shortages), and is affected both by market conditions and by factors such as physical storage costs.

### *Quantitative Standards*

Institutions will have flexibility in devising the precise nature of their models, but the following minimum standards will apply for the purpose of calculating their capital charge:

- (a) "value at risk" should be computed on a daily basis.
- (b) in calculating the value-at-risk, a 99th percentile, one-tailed confidence interval is to be used.
- (c) in calculating value-at-risk, the minimum holding period will be ten trading days. For positions that display linear price characteristics (but not options), institutions may use value-at-risk numbers calculated according to shorter holding periods scaled up to ten days by the square root of time (for the treatment of options, also see (h) below).
- (d) the historical observation period (sample period) for calculating value-at-risk will be constrained to a minimum length of one year. For institutions that use a weighting scheme or other methods for the historical observation period, the "effective" observation period must be at least one year (that is, the weighted average duration of all daily time series data should be no less than 6 months).
- (e) institutions should update their data sets no less frequently than one every three months and should also reassess them whenever market prices are subject to material changes. OSFI may also require an institution to calculate its value-at-risk using a shorter observation period if, in OSFI's judgement, this is justified by a significant upsurge in price volatility.
- (f) no particular type of model is prescribed. So long as each model used captures all the material risks run by the institution, as set out in section 3-3, institutions will be free to use models based on variance-covariance matrices, historical simulations, or Monte Carlo simulations.
- (g) institutions will have discretion to recognize empirical correlations within broad risk categories (e.g., interest rates, exchange rates, equity prices and commodity prices, including related options volatilities in each risk factor category). OSFI may also recognize empirical correlations across broad risk factor categories, provided OSFI is satisfied that the institution's system for measuring correlations is sound and implemented with integrity.

- (h) institutions' models must accurately capture the unique risks associated with options within each of the broad risk categories. The following criteria apply to the measurement of options risks:
- institutions' models must capture the non-linear price characteristics of options positions;
  - institutions are expected to ultimately move towards the application of a full 10 day price shock to options positions or positions that display option-like characteristics. In the interim, OSFI will accept estimates of less than a 10 day price shock that are adjusted to an equivalent 10 day price shock using a square root of time adjustment; and
  - each institution's risk measurement system must have a set of risk factors that captures the volatilities of the rates and prices underlying option positions, i.e., vega risk. Institutions with relatively large and/or complex options portfolios should have detailed specifications of the relevant volatilities. This means that institutions should measure the volatilities of the options positions broken down by different maturities.
- (i) each institution must meet, on a daily basis, a capital requirement expressed as the higher of (i) the previous day's value-at-risk number measured according to the parameters specified in this section and (ii) an average of the daily value-at-risk measures on each of the preceding sixty business days multiplied by 3. OSFI may require institutions to add to this factor a "plus" directly related to the ex-post performance of the model derived from the outcome of "back-testing" and be zero when such results are satisfactory.
- (j) institutions using models will be subject to a separate capital charge to cover the specific risk of interest rate related instruments and equity securities<sup>3</sup> as defined in sections 2-1 and 2-2 to the extent that this risk is not incorporated into their models. The options for calculating the specific risk capital charge are set out in section 3-5-1.

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<sup>3</sup> Including the additional requirements set out in 2-2 for equity indices.

### *Specific Risk Calculation*

Institutions using an internal model may calculate their specific risk capital charge using modelled estimates if they meet all of the qualitative and quantitative requirements for general risk models as well as additional criteria set out below. Institutions which are unable to meet these additional criteria will be required to calculate their specific risk capital charge using the standardised approach.

#### *Criteria*

Modelled estimates of specific risk may be used providing the model:

- (a) explains the idiosyncratic price variation in the portfolio;<sup>4</sup>
- (b) demonstrably captures concentration (magnitude and changes in composition);<sup>5</sup>
- (c) signals rising risk in an adverse environment;<sup>6</sup> and
- (d) is validated through backtesting aimed at assessing whether specific risk is being accurately captured.

#### *Surcharge*

Institutions meeting the criteria set out above will calculate their specific risk capital charge based on the internal model measurements plus an additional prudential surcharge as defined in the following paragraph.

For institutions applying the surcharge, the total market risk capital requirement will equal a minimum of three times the internal model's general and specific risk measure plus a surcharge in the amount of either:

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<sup>4</sup> The key ex ante measures of model quality are "goodness-of-fit" measures which address the question of how much of the historical variation in price value is explained by the model.

<sup>5</sup> The institution would be expected to demonstrate that the model is sensitive to changes in portfolio construction and that higher capital charges are estimated for portfolios that have increasing concentrations.

<sup>6</sup> This could be achieved by incorporating in the historical estimation period of the model at least one full credit cycle and ensuring that the model would not have been inaccurate in the downward portion of the cycle. Another approach for demonstrating this is through simulation of historical or plausible worst-case environments.

- (a) the specific risk portion of the value-at-risk measure which should be isolated by the institution;<sup>7</sup> or, at the institution's option,
- (b) the value-at-risk measures of sub-portfolios of debt and equity positions that contain specific risk.<sup>8</sup>

Institutions using option (b) are required to identify their sub-portfolio structure in advance and may not change it without approval from the OSFI.

The surcharge defined in options (a) and (b) will continue to apply to the estimate of specific risk until such time as a OSFI determines appropriate standards for measuring event risk and default risk and the institution demonstrates that the methodologies it uses adequately capture these risks. The standards for event risk and default risk shall be determined after consultation with the Basle Committee on Banking Supervision.

Event risk is the risk of loss in the value of claims against a borrower or security issuer when that issuer experiences an event other than default which so greatly modifies net worth or future earnings prospects of the issuer that the market value of the securities is sharply reduced. Default risk is narrowly defined as the risk of loss in the value of claims against a borrower or security issuer when that borrower has insufficient asset to meet its obligations or is otherwise prevented from meeting its obligations in a timely manner. Default risk does not include the loss resulting from downgrades in creditworthiness.

### *Backtesting*

Institutions must have in place a process to analyze exceptions identified through the backtesting of sub-portfolios of specific risk. There will be a presumption that models that incorporate specific risk are "unacceptable" if the results at the sub-portfolio level produce a number of exceptions commensurate with the *Red Zone* as defined in the document, *Supervisory framework for the use of backtesting in conjunction with the internal models approach to market risk capital requirements*, issued by the Basle Committee on Banking Supervision in April 1996.

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<sup>7</sup> Institutions may select their own technique for identifying the specific risk component of the value-at-risk measure for purposes of applying the surcharge. Examples of these techniques include but are not limited to:

- using the incremental increase in value at risk arising from the modelling of specific risk factors;
- using the difference between the value-at-risk measure and a measure calculated by substituting each individual equity position by a representative index; or
- using an analytic separation between general market risk and specific risk implied by a particular model.

<sup>8</sup> This would apply to sub-portfolios containing positions that would be subject to specific risk under the standardised-based approach.



### *Stress Testing*

Institutions that use the internal models approach for meeting market risk capital requirements must have in place a rigorous and comprehensive stress testing program. Stress testing to identify events or influences that could greatly impact institutions is a key component of a institution's assessment of its capital position.

Institutions' stress scenarios need to cover a range of factors that can create extraordinary losses or gains in trading books, or make the control of risk in those books very difficult. These factors include low-probability events in all major types of risks, including the various components of market, credit, and operational risks. Stress scenarios need to shed light on the impact of such events on positions that display both linear and non-linear price characteristics (i.e., options and instruments that have options-like characteristics).

Institutions' stress tests should be both of a quantitative and qualitative nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios to which institutions could be exposed. Qualitative criteria should emphasize that two major goals of stress testing are to evaluate the capacity of the institution's capital to absorb potential large losses and to identify steps the institution can take to reduce its risk and conserve capital. This assessment is integral to setting and evaluating the institution's management strategy and the results of stress testing should be routinely communicated to senior management and, periodically, to the institution's board of directors.

Institutions should combine the use of supervisory stress scenarios with stress tests developed by institutions themselves to reflect their specific risk characteristics. Specifically, OSFI may ask institutions to provide information on stress testing in three broad areas:

(a) Supervisory scenarios requiring no simulations by the institution

Institutions should have information on the largest losses experienced during the reporting period available for supervisory review. This loss information could be compared to the level of capital that results from an institution's internal measurement system. For example, it could provide OSFI with the coverage ratio of reported VaR capital to the maximum one day loss during the reporting period.

(b) Scenarios requiring a simulation by the institution

Institutions should subject their portfolios to a series of simulated stress scenarios and provide OSFI with the results [quarterly]. These scenarios could include testing the current portfolio against past periods of significant disturbance, for example the 1987 equity crash, the ERM crises of 1992 and 1993 or the fall in bond markets in the first quarter of 1994 incorporating both the large price movements and the sharp reduction in liquidity associated with these events. A second type of scenario would evaluate the sensitivity of the institution's market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the institution's current positions against the extreme values of the historical range. Due consideration should be given to the sharp variation that at times has occurred in a matter of days in periods of significant market disturbance. The 1987 equity crash, the suspension of the ERM, or the fall in bond markets in the first quarter of 1994, for example, all involved correlations within risk factors approaching the extreme values of 1 or -1 for several days at the height of the disturbance.

(c) Scenarios developed by the institution itself to capture the specific characteristics of its portfolio

In addition to the scenarios prescribed by OSFI under (a) and (b) above, an institution should also develop its own stress tests which it identifies as most adverse based on the characteristics of its portfolio (e.g., problems in a key region of the world combined with a sharp move in oil prices). Institutions should provide OSFI with a description of the methodology used to identify and carry out the scenarios as well as with a description of the results derived from these scenarios.

The results should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors. Moreover, if the testing reveals particular vulnerability to a given set of circumstances, OSFI would expect the institution to take prompt steps to manage those risks appropriately (e.g., by hedging against that outcome or reducing the size of its exposures).

***Model Validation***

In reviewing the institution's internal model OSFI will also require assurance that:

- (a) the internal validation processes described in section 3-2 (h) are operating in a satisfactory manner;
- (b) the formulae used in the calculation process as well as for the pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area;
- (c) the structure of internal models is adequate with respect to the institution's activities and geographical coverage;
- (d) the results of the institutions' back-testing of its internal measurement system (i.e., comparing value-at-risk estimates with actual profits and losses) ensure that the model provides a reliable measure of potential losses over time. The results as well as the underlying inputs to their value-at-risk calculations should be available to OSFI and external auditors on request;
- (e) data flows and processes associated with the risk measurement system are transparent and accessible. In particular, it is necessary that auditors or OSFI are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the models' specifications and parameters.

### *Combination of Internal Models and The Standardized Methodology*

Unless a institution's exposure to a particular risk factor, such as commodity prices, is insignificant, the internal measurement system will in principle require institutions to have an integrated risk measurement system that captures the broad risk factor categories (i.e., interest rates, exchange rates, equity prices and commodity prices, with related options volatilities being included in each risk factor category). Thus, institutions which start to use models for one or more risk factor categories will, over time, be expected to extend the models to all their market risks. An institution which has developed one or more models will no longer be able to revert to measuring the risk measured by those models according to the standardized methodology (unless OSFI withdraws approval for that models). However, pending further experience regarding the process of changing to a models-based approach, no specific time limit will be set for institutions which use a combination of internal models and the standardized methodology to move to a comprehensive models.

The following conditions apply to institutions using such combinations:

- (a) subject to transitional arrangements, each broad risk factor category must be assessed using a single approach (either internal models or the standardized approach), i.e., no combination of the two methods will be permitted within a risk category or across the institutions' different entities for the same type of risk;<sup>9</sup>
- (b) all criteria laid down under tab 3 of Guideline A - Part II will apply to the models being used;
- (c) institutions may not switch from a model to the standardized approach unless OSFI rescinds permission to use the model for capital adequacy purposes;
- (d) no element of market risk may escape measurement, i.e., the exposure for all the various risk factors, whether calculated according to the standardized approach or internal models, would have to be captured;
- (e) the capital charges assessed under the standardized approach and under the models approach are to be aggregated according to the simple sum method.

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<sup>9</sup> However, institutions may incur risks in positions which are not captured by their models, for example, in remote locations, in minor currencies or in negligible business areas. Such risks should be measured according to the standardized methodology.

On a case by case basis, OSFI may permit short term transitional arrangements for using a combination of internal models and the standardized approach for any risk across all of an institution's operations. Approval of these temporary arrangements will be subject to:

- (a) the institution providing adequate internal controls that prevent switching of business between legal entities to achieve the most advantageous capital charge;
- (b) the Superintendent imposing an additional capital requirement which may be amended periodically depending on the circumstances of the transitional arrangements. The additional requirement will terminate once the risk category is fully assessed under the internal models approach; and
- (c) the institution entering into a formal undertaking to comply with the conditions of the temporary arrangement and to expand the internal model on or before a specific date to those operations initially using the standardised approach.

## Glossary

At-the-money:	an option is at-the-money when the price of the underlying instrument is equal to the option's exercise price.
Barrier option:	path-dependent options with both their payoff pattern and their survival to the nominal expiration date dependent on <u>both</u> the final price of the underlying instrument and on whether or not the underlying instrument sells at or through the barrier (instrike, outstrike) price during the life of the option. Examples of barrier options include down-and-out and up-and-in puts and calls, early exercise trigger CAPS options, and a variety of similar instruments.
Basis risk:	the risk that the relationship between the prices of two similar, but not identical, instruments will change. Thus, even if maturities are perfectly matched, basis risk could remain.
Building-block approach:	a method for measuring price risk which disaggregates risk specific to a security/issuer and general market risk.
Confidence level:	the degree of protection observed against price movements judged appropriate in setting a capital requirement.
Convertible bond:	a bond which gives the investor the option to switch into equity at a fixed conversion price.
Counterparty risk:	the risk that the counterparty to a financial contract will not meet the terms of the contract.
Covered debt positions:	the current market value of an institution's net holdings, whether long or short, of the <u>identical</u> issue (including certain derivative contracts) to which a specific risk capital charge applies.
Currency swap:	a transaction involving an initial exchange of principal of two different currencies. Interest payments are exchanged over the life of the contract and the principal amounts are repaid either at maturity or according to a predetermined amortisation schedule.

Deep discount bonds:	all interest-earning assets with coupon rates of 3% or less (see zero coupon bonds).
Delta:	the expected change of an option's price as a proportion of a small change in the price of the underlying instrument. An option whose price changes by \$1 for every \$2 change in the price of the underlying has a delta of 0.5. The delta rises toward 1.0 for options that are deep in-the-money and approaches 0 for deep out-of-the-money options.
Delta hedging:	a method option traders use to hedge risk exposure of options by the purchase or sale of the underlying asset in proportion to the delta. A delta-neutral position is established when the option trader strictly delta-hedges so as to leave the combined financial position in options and underlying instruments unaffected by small changes in the price of the underlying.
Digital option:	an option with a fixed, predetermined payoff if the underlying instrument is at or beyond the strike prices at expiration. The value of the payoff is not affected by the magnitude of the difference between the underlying instrument and the strike price.
Duration:	a measure of the price sensitivity of debt securities to small parallel changes in interest rates. It is the weighted average maturity of all payments of a security, coupons plus principal, where the weights are the discounted present values of the payments. Modified duration is duration divided by a factor of one plus the interest rate.
European-style option:	an option which may be exercised only on the expiration date. An alternative to an American option, which can be exercised at the holder's initiative prior to expiration.
Exercise price also Strike price:	the fixed price at which an option holder has the right to buy, in the case of a call option, or to sell, in the case of a put option, the financial instrument covered by the option.

Forward:	a commitment to buy (sell) an asset at a future date for a price determined at the time of commitment, usually reflecting the net cost of carry. May be applied to currencies, equities, commodities or other assets.
Forward rate agreement (FRA):	a contract in which two counterparties agree on the interest rate to be paid on a notional deposit of specified maturity at a specific future time. Normally, no principal exchanges are involved, and the differences between the contracted rate and the prevailing rate is settled in cash.
Futures contract:	an exchange-traded contract generally calling for delivery of a specified amount of a particular grade of commodity or financial instrument at a fixed date in the future.
Gamma:	the sensitivity of an option's delta to small changes in the price of the underlying; alternatively, the sensitivity of a delta-hedged position to large unit changes in the price of the underlying.
General market risk:	the risk of a general market movement arising from, for example, a change in interest rates or official policy.
Hedge:	to reduce risk by taking a position which offsets existing or anticipated exposure to a change in market rates or prices.
Holding period:	the length of time that a financial institution is assumed to hold a given financial instrument for the purpose of calculating price volatility.
Interest rate risk:	the risk that changes in market interest rates might adversely affect an institution's financial condition.
Interest rate swap:	a transaction in which two counterparties exchange interest payment streams of differing character based on an underlying notional principal amount. The three main types are coupon swaps (fixed rate to floating rate in the same currency), basis swaps (one floating rate index to another floating rate index in the same currency) and cross-currency interest rate swaps (fixed rate in one currency to floating rate in another).



In-the-money:	option contracts are in the money when there is a net financial benefit to be derived from exercising the option immediately. A call option is in the money when the price of the underlying instrument is above the exercise price and a put option is in the money when the price of the underlying is below the exercise price.
Investment-grade:	securities which are rated at or above Baa by Moody's Investors Services or BBB by Standard & Poor's Corporation.
LIBOR:	London Interbank Offered Rate. The rate at which banks offer to lend funds in the international interbank market.
Lock-in clause:	a clause in a subordinated loan contract stipulating that neither principal nor interest may be paid, even at maturity, if such payment would bring the issuer's capital below a given regulatory level.
Long option position:	the position of a trader who has purchased an option regardless of whether it is a put or a call.
Margin:	in this report, margin refers to a good-faith deposit (of money, securities or financial instruments) required by a futures or commodity exchange to assure performance. Futures and options exchanges often require traders to post initial margin when they enter into new contracts. Margin accounts are debited or credited to reflect changes in the current market prices on the positions held. Members must replenish the margin account if margin falls below a minimum.
Market risk:	the risk of losses in on and off-balance-sheet positions arising from movements in market prices, including interest rates, exchange rates and equity values.
Marking-to-market:	the process of revaluing a portfolio on the basis of prevailing market prices.
Matched weighted position	the smaller of the sum of the risk weighted long positions or the sum of the risk weighted short positions within a time band or a zone or between zones.

Observation period:	the period over which it is judged appropriate to review historical data in setting a capital requirement. For example, the requirement might be set according to observed price changes over the past five years.
Off-balance-sheet activities:	banks' business that does not generally involve booking assets or liabilities. Examples include trading in swaps, options, futures and foreign exchange forwards, and the granting of standby commitments and letters of credit. <sup>1</sup>
Option:	the contractual right, but not the obligation, to buy or sell a specified amount of a given financial instrument at a fixed price before or at a designated future date. A call option converts on the holder the right to buy the financial instrument. A put option involves the right to sell the financial instrument.
OTC (over-the-counter):	trading in financial instruments transacted off organized exchanges. Generally the parties negotiate all details of the transactions, or agree to certain simplifying market conventions.
Out-of-the-money:	an option contract is out of the money when there is no benefit to be derived from exercising the option immediately. A call option is out of the money when the price of the underlying is below the option's exercise price. A put option is out of the money when the price of the underlying is above the option's exercise price.
Repurchase agreement:	a holder of securities sells securities to a counterparty with an agreement to repurchase them at a fixed price on a fixed date.
Settlement:	the completion of a transaction, wherein the seller transfers securities or financial instruments to the buyer and the buyer transfers money to the seller.

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<sup>1</sup> In certain countries, some of these instruments may be on the balance sheet.

Settlement risk:	the risk that a counterparty to whom a firm has made a delivery of assets or money defaults before the amounts due or assets have been received; may also in certain contexts refer to the risk that technical difficulties interrupt delivery or settlement even if the counterparties are able to perform.
Short option position:	the position of a trader who has sold or written an option. The writer's maximum potential profit is the premium received.
Simulation:	a mathematical technique for measuring the likely performance of a given portfolio for changes in certain parameters such as market interest rates or foreign exchange rates.
Specific risk:	the risk that the price of a given instrument will move out of line with similar instruments, due principally to factors related to its issuer.
Subordinated loans:	debt issued by financial institutions which in liquidation is subordinated to claims by general creditors but which ranks above ordinary and preferred shares.
Swap:	a financial transaction in which two counterparties agree to exchange streams of payments over time according to a predetermined rule.
Trading book:	an institution's proprietary positions in financial instruments which are taken on with the intention of benefitting in the short term from actual or expected differences between their buying and selling prices or of hedging other elements of the trading book, or which are held for short-term resale, or in order to execute a trade with a customer.
Volatility:	a measure of the variability of the price of an asset, usually defined as the annualized standard deviation of the natural log of asset prices.
Warrant:	tradeable instrument with the character of an option whose holder has the right to purchase from, or sell to, the warrant issuer a quantity of financial instruments under specified conditions for a specified period of time.
Writer:	the party that sells an option. The writer is required to carry out the terms of the option at the choice of the holder.

Zero coupon  
bonds:

securities which do not make periodic interest payments and are redeemed at face value at a specified maturity date. These securities are sold at a deep discount, and the return accrues to the buyer as the security gradually appreciates.

**CREDIT DERIVATIVES - CAPITAL TREATMENT**

**APPENDIX TO GUIDELINE A: PARTS I & II**

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## A. Introduction

Credit derivatives are off balance sheet financial instruments used to assume or mitigate the credit risk of loans and other assets. Institutions may employ these products either as end-users (purchasing credit protection or acquiring credit exposure from third parties) or as dealers intermediating credit risk between buyers and sellers. Refer to Annex 1 for additional background.

OSFI has revised its capital adequacy requirements for banks and trust and loan companies to address the capital required as a result of credit derivatives used in both trading and non-trading activities. This revised guidance is an Appendix to Guideline A – Capital Adequacy Requirements (CAR) –Parts I & II and replaces the Interim Appendix of November 1999 and OSFI's Policy Statement #4 of October 1997.

This Appendix addresses the capital requirements of three major product types: total rate of return products, credit default products, and credit-linked notes. All of these products are described in greater detail in Annex 2 of this guideline. Other types of credit derivatives will not be eligible for capital relief under this guidance.

## B. General Criteria for Risk Transfer

There are two main criteria that determine the capital recognition given to the transfer of credit risk:

- (i) the effectiveness of the risk transfer; and
- (ii) the permanence of the transfer.

To achieve an effective risk transfer, the credit derivative must:

- protect against deterioration in value or credit loss in the event of default on the asset held on the institution's balance sheet; and
- be explicit, irrevocable, unconditional and legally enforceable.

To achieve a prudent level of permanence to the transfer of credit risk, the credit derivative must:

- have a minimum term for recognizing any hedging effect; and
- be subject to a capital charge for the unhedged forward credit risk (roll-off risk) arising from maturity mismatches.

## C. Capital Treatment - Banking Book

Under OSFI's current capital adequacy framework for deposit-taking institutions (DTI's), the risk weight applied to a loan in the banking book can be reduced either by obtaining eligible collateral or by acquiring a qualifying guarantee. This section outlines conditions for applying guarantee treatment to credit derivatives in the banking book.

### Guarantor Treatment

An institution that provides (sells) credit protection (the guarantor) through a credit derivative becomes exposed to the credit risk of the reference asset. For supervisory purposes, the exposure should be treated as if it were a guarantee or direct credit substitute on the reference asset.

The guarantee treatment is applied to all credit derivatives in the banking book, except for credit derivative contracts that incorporate periodic payments for depreciation and appreciation in the value of swap contracts (primarily total-rate-of-return swaps). In these cases, the guarantor, or provider of protection, can deduct the amount of depreciation paid to the beneficiary from the notional amount of the contract in determining the amount of exposure subject to a capital charge.

### Beneficiary Treatment

An institution that receives the guarantee or buys credit protection (the beneficiary) may reduce the risk weight of the underlying asset to that of the guarantor (seller of credit protection) if the transfer of risk is effective and achieves an adequate level of permanence (see Exceptional Circumstances, below).

For credit derivatives that are funded through a cash deposit with, or by providing eligible collateral to, the beneficiary institution (usually credit-linked notes), the risk weight of the corresponding underlying (owned) asset is lowered to that of the collateral or the guarantor. In cases involving cash deposits, the cash is treated as collateral as outlined in CAR – Part I (page 5-1-1).

### Exceptional Circumstances - (Guarantor/Beneficiary)

Although a guarantee is the best analogy to a credit derivative, a number of credit derivative products have features that distinguish them from traditional guarantee products. The following sections contain guidance on the treatment of credit derivatives with such features.

### *Credit Events*

The specification of credit events can dramatically affect the effectiveness of the risk transfer associated with credit derivatives. The criterion for credit derivatives establishes that the contracts must be explicit, irrevocable, unconditional and legally enforceable; however, differences between regulatory recognition and market terms may exist.

For regulatory recognition, credit events specified in the contracts must, at a minimum, include:

- failure to pay any amounts due according to the terms of the assets specified;
- a reduction in the rate of interest or amount of interest payable or the amount of interest accrued;
- a reduction in the amount of principal or premium payable;
- a change in the ranking of any obligation causing subordination of the obligation;
- repudiation;
- filing for bankruptcy or protection from creditors;
- distressed restructuring; and
- cross-default or cross-acceleration.

If the terms of the credit derivative define credit events so as to limit the degree of credit risk transfer, then the beneficiary institution cannot reduce the risk weight of the underlying asset to that of the guarantor. One such example occurs with restrictive definitions of credit events, such as materiality thresholds that require a high percentage of loss to occur before the guarantor is obliged to make payment. In these cases, the degree of risk transfer is significantly limited. Consequently, the products are ineligible for guarantee treatment by the beneficiary and the beneficiary would continue to hold capital against the underlying asset.

### *Retained Risk*

Beneficiary institutions retain risk in a credit derivative transaction when they would be required to absorb any loss or de-value the underlying asset prior to the guarantor settling the contract. Risk is also retained if the amount of protection can be reduced by a threshold amount of losses. Under such circumstances, the beneficiary institution will have to deduct the total amount of retained risk from capital on a dollar for dollar basis. This deduction is equivalent to that applied in asset securitization and synthetic securitization transactions.

### *Asset Mismatches*

Institutions providing (selling) credit protection through a credit derivative must hold capital against this guarantee based on the risk weight of the reference asset.



In some instances, the reference asset in the credit derivative transaction may not be identical to the balance sheet asset (i.e., underlying asset) for which the beneficiary has acquired credit protection. In such cases, the underlying asset can still be considered guaranteed by the beneficiary for capital purposes as long as the following three conditions are met:

- the underlying asset and the reference asset are both obligations of the same legal entity;
- the reference asset has the same or a more junior level of seniority than the underlying asset in bankruptcy; and
- both assets are subject to mutual cross-default or cross acceleration provisions.

When the reference asset is different from the underlying asset, the risk weight to be applied by the beneficiary will be the higher of their respective risk weights.

#### *Quality of Guarantor*

If the senior unsecured debt rating of the provider of a credit derivative is lower than the equivalent of a single A rating, the beneficiary may not treat the underlying asset as guaranteed. This condition would be applied on the same basis as the qualifying category for debt securities under CAR – Part II, Market Risk.

#### *Multiple Names*

Some credit derivatives provide credit protection for a group or basket of reference assets and call for the guarantor to absorb losses on only the first asset that defaults (known as “first-to-default” credit protection). In such cases, the credit protection for the remaining assets ceases to exist once the first asset in the group defaults. A guarantor institution providing first-to-default credit protection must assign the contract's notional amount of credit exposure (single highest payout amount) to the highest risk-weighted asset(s) in the basket and hold capital accordingly. For the beneficiary, the asset of the lowest risk-weighted amount in the basket may be treated as guaranteed, but only if its risk-weighted amount is less than or equal to the notional amount of the credit derivative.

#### *Maturity Mismatches*

Residual maturity is the time remaining to the contractual maturity of the credit derivative. When a credit derivative includes a call option or step-up clause (an increase in the cost of the protection), its residual maturity will be assumed to be the period remaining to the earlier of the call option or step-up dates. Effective maturity of the underlying asset is the longest possible remaining time before the obligor is scheduled to fulfil the obligation.

A maturity mismatch occurs when the residual maturity of a hedge is less than that of the underlying exposure. While, in general, it is preferable that the credit derivative and underlying asset are of the same maturity, there may be sound economic and risk management reasons for acquiring mismatched protection.

Where the residual maturity of the credit derivative is less than the effective maturity of the underlying asset, recognition of the protection will depend on the residual maturity of the credit derivative. Where there is no maturity mismatch, regardless of tenure, the recognition of the protection from the credit derivative will result in a reduction in the risk weighting of the underlying.

**Maturities Under One Year:** Where the residual maturity of the credit derivative is less than one year, no reduction in required capital will be permitted. For example, an underlying asset maturing in two years supported by a credit derivative with a residual maturity of six months would not receive any reduction in risk weighting.

**Maturities Over One Year:** Where the residual maturity of the credit derivative is greater than one year and the effective maturity of the underlying asset is greater than the residual maturity of the credit derivative, the amount of credit protection provided is a function of the maturity mismatch – the shorter the mismatch, the greater the credit protection, all else being equal. In effect, the beneficiary calculates the risk-weighted amount of its position as the weighted average of: (i) the amount using the risk weight of the guarantor (i.e., the risk-weighted amount of a covered position in the underlying asset if there were no maturity mismatch), and (ii) the amount using the risk weight of the underlying asset (i.e., the risk-weighted amount of an uncovered position in the underlying asset), where the weights are equal to the relative duration of the covered and uncovered positions relative to the duration of the underlying asset.

This calculation applies where the notional amount of the credit derivative is equal to the notional amount of the underlying asset. Where this is not the case, the amount by which the notional amount of the underlying asset exceeds that of the credit derivative would attract the risk weight that would apply to the underlying asset in the normal course.

The adjusted risk weight for positions involving maturity-mismatched credit derivatives (but only up to the notional amount of the credit derivative if it is less than that of the underlying asset) is represented in formulae as follows:

for  $t$  less than 1 year, where no relief is provided:  $r^{**} = r$

for  $1 \text{ year} \leq t < T$ : 
$$r^{**} = \left(1 - \frac{t}{T}\right) * r + \left(\frac{t}{T}\right) * r^*$$

or equivalently, 
$$r^{**} = r - \left(\frac{t}{T}\right) * (r - r^*)$$

where:

$r^{**}$  is the risk weight of the mismatched position;

$r$  is the risk weight on the uncovered position;

$r^*$  is the risk weight if the position had been covered without a maturity mismatch;

$t$  is the residual maturity of the credit derivative; and

$T$  is the effective maturity of the underlying asset ( $t \leq T$ ).

## D. Capital Treatment - Trading Book

All credit derivatives held in the trading book are subject to counterparty credit risk capital requirements. Most credit derivative products are also subject to general market risk capital requirements and to the specific risk capital requirement of the reference asset. This specific risk associated with a credit derivative is equivalent to that associated with a cash position in the reference asset (i.e., a loan or bond). Definitions for counterparty credit risk, specific risk, and general market risk are the same as those found in the market risk guideline (CAR - Part II).

Under current capital adequacy guidelines, institutions calculate their trading book market risk requirements using either an approved model or the standardized approach. Trading book treatment of many credit derivatives that reference loans, however, raises additional issues that are not explicitly addressed in the current guidelines. Market risk capital requirements were premised on assumptions about accurate valuation and effective tradability that may not be appropriate for bank loans and loan-based credit derivatives. Accordingly, an institution that believes its unique circumstances justify booking loans or loan-based credit derivatives in its trading account should, in advance, provide its Relationship Manager with a detailed justification that addresses, among other things, the nature of the trading activity, the ability to fair value the instruments on a daily basis, and the availability of a history of price movements over a relevant time frame. Where such instruments are included in the trading book for capital purposes, OSFI may, based on its review of the justification provided, increase the institution's capital requirements for this activity if the determination of price or liquidity presents additional risks.

The calculation of counterparty credit risk requirements is the same whether institutions use the standardized or models approach. Guidance on calculating the counterparty credit risk of credit derivatives in the trading book and on using the standardized and models approaches for calculating the general and specific risk of credit derivatives is provided below.

### Counterparty Credit Risk

CAR – Part I requires a counterparty credit risk charge that is calculated by adding:

- i. the replacement cost (mark-to-market value) of the derivative; and
- ii. the potential future exposure, which is the result of multiplying the notional principal amount of the derivative by an add-on factor (the add-on factor to be used depends on the type and maturity of the derivative transaction).

The appropriate add-on factor to use to calculate the potential future exposure to counterparty credit risk depends on whether the reference asset is a qualifying asset under CAR – Part II, Market Risk (page 2-1-3). For qualifying reference assets, the equity add-ons will be applied for the appropriate maturity. For non-qualifying reference assets, an equity add-on may still be used where the counterparty has posted high quality eligible collateral (i.e., collateral which attracts a 0% risk weight as defined in CAR – Part I, page 5-1-1). The commodity add-on factor is to be used when the reference asset does not meet the qualifying definitions. Add-on factors can be referenced in the CAR – Part I (page 4-3-2).

For a *total rate of return product*, each party relies on the other for payment; therefore, each party records a counterparty credit risk charge. The counterparty credit risk for *credit default swaps* is determined on the same basis as any other over-the-counter option contract. The beneficiary of the swap relies on the guarantor to pay if a credit event occurs and, therefore, must record a counterparty credit risk charge against the guarantor. The guarantor in the swap is exposed to the beneficiary only if there are future premiums or interest related payments. Although such swaps do not require counterparty credit risk calculations by the guarantor, the guarantor must record an exposure to the reference asset. In *credit-linked notes*, there is no counterparty credit risk charge.

### Standardized Approach

This section applies to institutions that calculate their market risk requirements using the standardized methodology. Product descriptions and cash flow schematics are provided in Annex 2.

*Total rate of return swaps* are represented as two legs of a single transaction. The first leg is a notional position in the reference asset to which the corresponding general and specific risk charges apply. The second leg, representing interest payments under the swap, is recorded as a notional position in an OECD government bond with the appropriate fixed or floating rate.

*Credit default swaps/products* are represented as a notional position in the reference asset but are

subject only to a specific risk charge. For such products, there is no general market risk position created in the reference asset. If periodic premium or interest payments are required under the swap, these cash flows are represented as a notional position in an OECD government bond with the appropriate fixed or floating rate.

*Credit-linked notes* are treated as a position in the note itself, with an embedded credit default product. The credit-linked note has specific risk of the issuer and general market risk according to the coupon or interest rate of the note. The embedded credit default product creates a notional position in the specific risk of the reference asset.

### *Specific Risk*

In almost all credit derivatives (including total rate of return swaps, credit default products and credit-linked notes) specific risk is created in the reference asset. When the credit derivative is for a single reference asset, the beneficiary creates a short position in the reference asset, while the guarantor creates a long position in the reference asset. For some credit-linked note products or other products in which the guarantor funds the beneficiary (posts cash or collateral), a long specific risk position in the note issuer, in the amount of the collateral, is also created.

The specific risk capital charge is calculated by multiplying the absolute values of the derivative positions (mark-to-market) in the trading book by their respective risk factors. Risk factors are outlined in CAR – Part II, Market Risk. Institutions generally will apply factors based upon the section on debt instruments, which takes into account the category (government, qualifying, or non-qualifying) and the residual maturity (six months to two years).

### *Multiple Names*

For credit derivatives that reference multiple names, the structure of the contract will determine the long and short positions that are created for capital purposes. In addition, the type of product used will also have a bearing on the positions created. In general, the number of exposures in a basket transaction should be limited to a reasonable number to continue to be treated as a credit derivative. If the number of exposures is deemed to be significant then the transaction may be treated as a synthetic securitization and therefore subject to additional rules.

For a total rate of return swap that references multiple names, the institution should record long or short positions in all the reference assets according to their relative proportions underlying the swap. This approach applies where the returns on the assets are exchanged between the swap counterparties according to the asset proportions in the basket. If this is not the case, the long and short positions should be altered to reflect the asset returns.

The beneficiary in a basket transaction that is structured as a "first-to-default" product must record a short position in one reference asset in the basket. Institutions may choose the specific asset in the basket to be used for this purpose, provided it is an asset carrying the highest risk weighting or one that reflects the greatest risk.

The guarantor in a basket transaction that is structured as a "first-to-default" product must record long positions in each asset in the basket. This is because there is no knowledge as to which asset could default. The total capital charge for this type of product will be capped at the equivalent of a deduction from capital for the entire notional amount.

Where a basket transaction or multiple name note is rated so that it meets the conditions for recognition as a "qualifying" debt instrument under CAR – Part II, Market Risk, the guarantor may record the specific risk position in the reference assets as a single long specific risk position with the specific risk of the note issuer.

#### *Netting*

Netting of positions within the specific risk category is permitted under the conditions described for offsetting and matched positions (see Annex 3). Where a credit default product or credit-linked note is of shorter maturity than the reference asset, a specific risk offset is allowed between the long and short specific risk positions, but a forward position in the specific risk of the reference asset is recorded. The net result is a single specific risk charge for the longer maturity position in the reference asset.

#### *General Market Risk*

General market risk for credit derivatives is calculated using the same methodology as that used for cash market debt instruments. As a result, the combinations for general market risk charges are more limited than those combinations relating to specific risk. Refer to CAR – Part II, Market Risk, to determine the capital allocation of general market risk rules.

Most credit default products do not create a general market risk position for either the guarantor or the beneficiary, since they are written against one counterparty's potential default. There is no risk exposure to market movements.

Total rate of return products create a long or short position in the reference asset as well as a short or long position in the notional bond representing the interest rate related leg of the contract. These positions should be incorporated into a maturity ladder using standardized risk weights that approximate the price sensitivity of the instruments.

Credit-linked note products create a long position in the note itself but the position is only applied to the guarantor.

### *Models Approach*

With the adoption of CAR – Part II, Market Risk, institutions can use their internal models to determine the amount of capital required if such models meet OSFI's requirements and they have been approved for these types of products. These internal models apply a daily value-at-risk (VAR) measure for positions within the trading book. Questions on the use of models for credit derivatives should be directed to an institution's Relationship Manager.

## **E. Risk Management**

Sound risk management practices are essential for an institution engaging in credit derivatives. Factors to consider for institutions engaging in credit derivative activities are the same as those for other derivative products and are outlined in OSFI Guideline B-7 - Derivatives Best Practices.

Credit derivatives offer institutions the potential to improve the risk/return profile of their credit portfolios through risk diversification; however, these products are largely untested and are generally illiquid. Similarly, valuation methods for credit derivative transactions are not as well developed as they are for other derivatives. In light of these uncertainties, institutions interested in using credit derivatives should exercise proper care and due diligence before participating. In particular, credit derivatives should be subject to a rigorous process for new product approval to ensure that adequate policies, procedures, controls and resources exist to undertake this activity.

Credit derivatives entail risks similar to those inherent in traditional banking products. However, credit derivatives may introduce risks in unfamiliar combinations, thereby posing unique challenges to the way the risks are measured, monitored, and controlled. When OSFI reviews credit derivatives, they will assess how institutions have evaluated the amount of credit, market, liquidity, operational, legal and regulatory risks involved in this activity. In addition, OSFI will evaluate the quality of the risk mitigants to manage and control these risks. These would include:

- effective board and senior management oversight, which includes the approval of strategy and the setting of limits;
- adequate risk management processes to identify, measure, monitor, control and report on exposure relative to the limits; and
- adequate internal controls and appropriate internal audit coverage.

## Annex 1 - Background

“Credit derivative” is a term generally used to describe various financial instruments that are marketed as an efficient way to manage credit exposure. Credit derivatives are designed to assume or mitigate the credit risk of loans and other assets through off-balance sheet transactions. Institutions may employ these products either as end-users, purchasing credit protection or acquiring credit exposure from third parties, or as dealers intermediating these activities. End-user institutions may use credit derivatives to reduce credit concentrations, improve portfolio diversification, or otherwise manage overall credit risk exposure.

Credit derivatives permit the transfer of credit exposure between counterparties in isolation from other risks. This is an extension of similar products that un-bundle risks, such as various interest rate contracts and foreign exchange products. Credit derivatives are primarily off-balance sheet contracts, as opposed to traditional loan type assets that are on-balance sheet.

Given that credit derivatives are relatively new products and banks are able to participate in a number of different roles, the terms used to define the participant's functions are evolving with the market place. For example, the guarantor is also referred to as the protection seller or credit risk buyer. On the other hand, the beneficiary is also referred to as the protection buyer or credit risk seller. These terms are often used interchangeably within the market place.

There are many reasons why a bank may use credit derivatives. Some of those include:

- reducing the capital required to support assets on the balance sheet;
- reducing credit risk concentrations by assuming a risk position in a market that it may otherwise not have access to;
- improving earnings by assuming credit risk in a specifically targeted risk;
- managing credit risk at the account level while not negatively affecting the customer relationship; and
- creating new assets and synthetic assets to meet wider investor demand and/or filling maturity and credit quality gaps.



## Annex 2 - Product Types

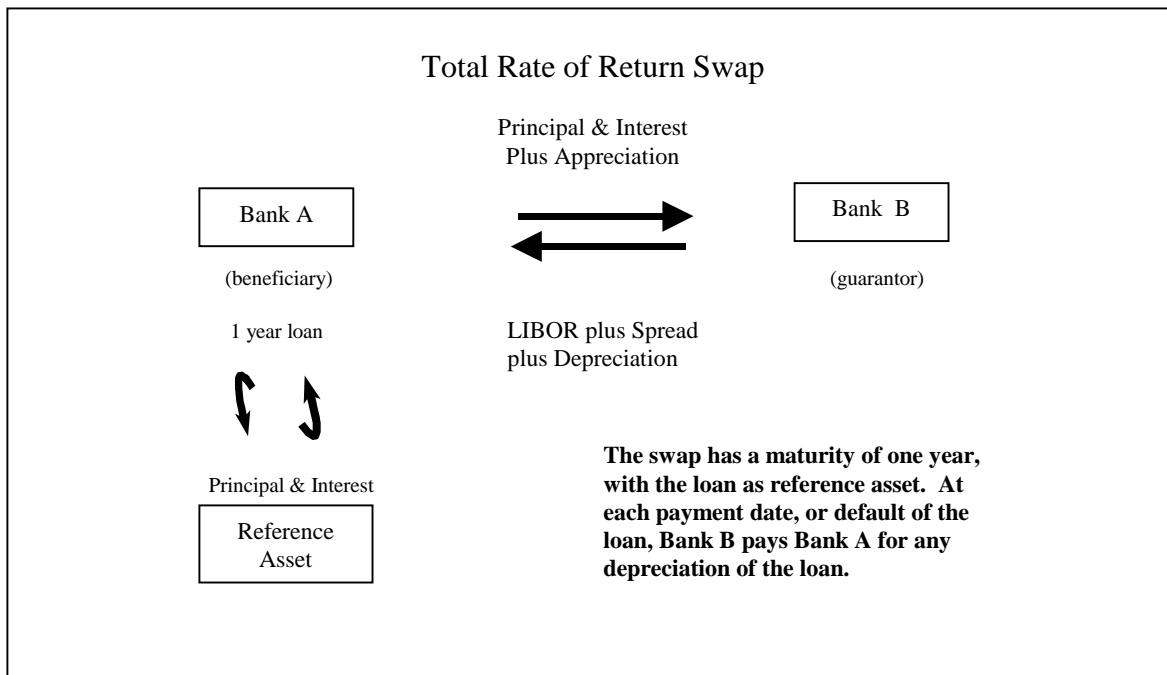
### *Description of Credit Derivatives*

The most widely used types of credit derivatives are credit default products and total rate-of-return (TROR) swaps. While the timing and structure of the cash flows associated with credit default and TROR swaps differ, the economic substance of both arrangements seek to transfer the credit risk of the asset(s) referenced in the transaction.

Another less common form of credit derivative is the credit-linked note, which is an obligation that is based on a reference asset. Credit-linked notes are similar to structured notes with embedded credit derivatives. Credit indicators on the reference asset rather than market price factors influence the payment of interest and principal. If there is a credit event, the repayment of the note's principal is based on the price of the reference asset.

#### Total Rate-of-Return Swap

In a total rate-of-return (TROR) swap, illustrated below, the beneficiary (Bank A) agrees to pay the guarantor (Bank B) the total return on the reference asset, which consists of all contractual payments, as well as any appreciation in the market value of the reference asset. To complete the swap arrangement, the guarantor agrees to pay LIBOR plus a spread and any depreciation to the beneficiary. The guarantor in a TROR swap could be viewed as having synthetic ownership of the reference asset since it bears the risks and rewards of ownership over the term of the swap.



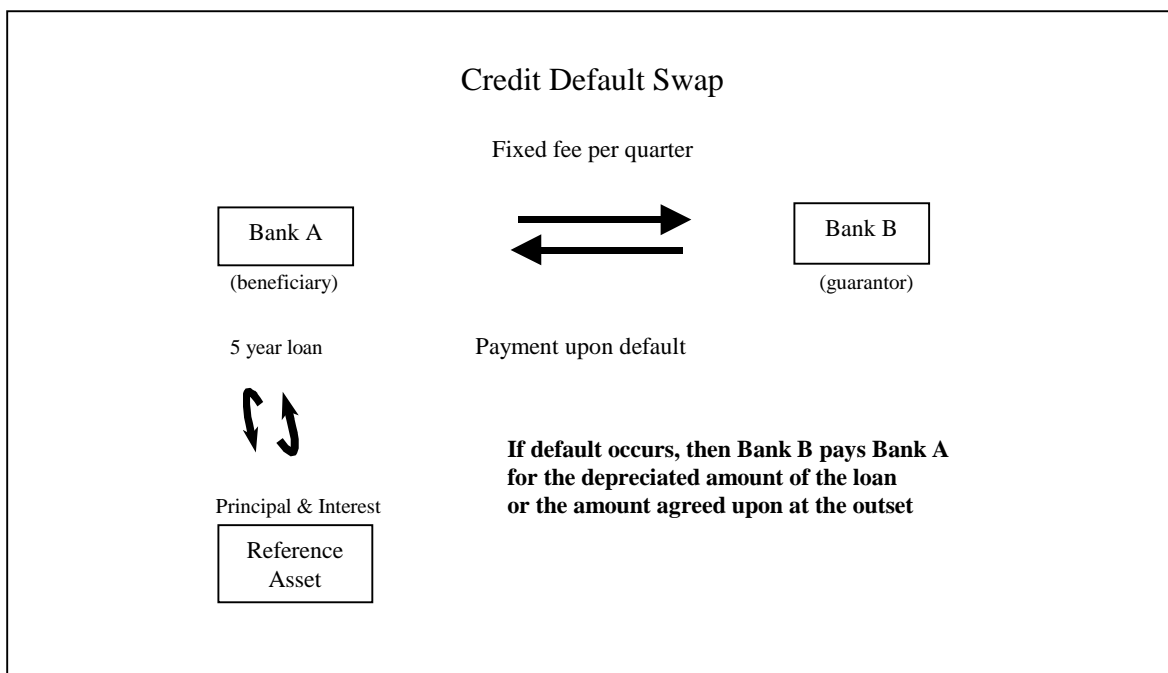
At each payment exchange date (including when the swap matures) -- or upon default, at which point the swap may terminate -- any depreciation or appreciation in the amortized value of the reference asset is calculated as the difference between the notional principal balance of the reference asset and the "dealer price."

The dealer price is generally determined either by referring to a market quotation source or by polling a group of dealers and reflects changes in the credit profile of the reference obligor and reference asset.

If the dealer price is less than the notional amount (i.e., the hypothetical original price of the reference asset) of the contract, then the guarantor must pay the difference to the beneficiary, absorbing any loss caused by a decline in the credit quality of the reference asset. Thus, a TROR swap differs from a standard direct credit substitute in that the guarantor is guaranteeing not only against default of the reference obligor, but also against a deterioration in that obligor's credit quality, which can occur even if there is no default.

*Credit Default Swaps/Products*

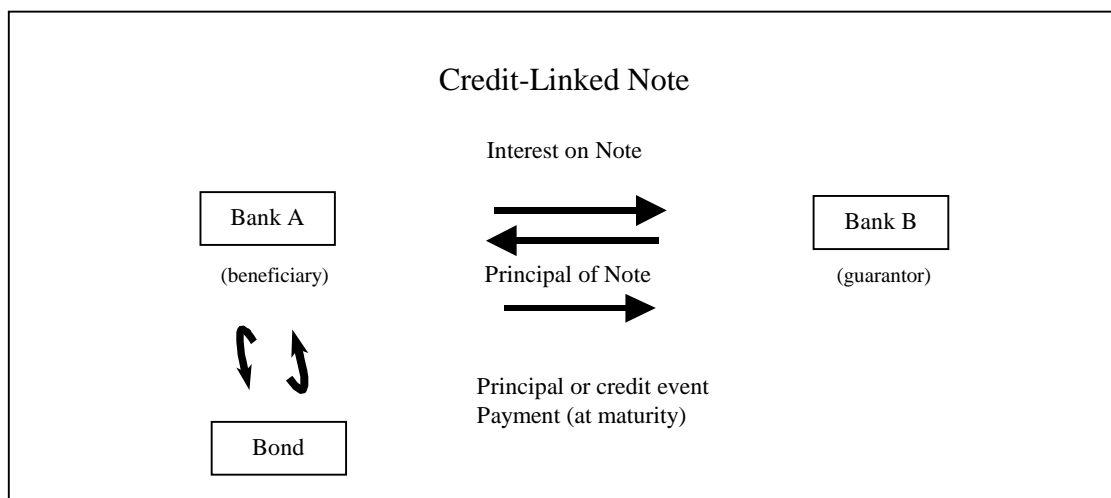
The purpose of a credit default swap, as its name suggests, is to provide protection against credit losses associated with a default on a specified reference asset. The swap purchaser (beneficiary) swaps the credit risk with the provider of the swap (guarantor). While the transaction is called a swap, it is very similar to a guarantee.



In a credit default swap, the beneficiary (Bank A) agrees to pay to the guarantor (Bank B) a fee typically amounting to a certain number of basis points on the par value of the reference asset, either quarterly or annually. In return, the guarantor agrees to pay the beneficiary an agreed upon, market-based, post-default amount or a predetermined fixed percentage of the value of the reference asset if there is a default. The guarantor makes no payment until there is a default. A default is strictly defined in the contract to include, for example, bankruptcy, insolvency, or payment default, and the default event must be publicly verifiable. In some instances, the guarantor need not make payments to the beneficiary until a pre-established amount of loss has been exceeded in conjunction with a default event. This event is often referred to as the maturity of the swap. The amount owed by the guarantor is the difference between the reference asset's initial principal (or notional) amount and the actual market value of the defaulted, reference asset. The method for establishing the post-default market value of the reference asset should be set out in the contract. Often, the market value of the defaulted reference asset may be determined by sampling dealer quotes. The guarantor may have the option to purchase the defaulted underlying asset and pursue a workout with the borrower directly. Alternatively, the swap may call for a fixed payment in the event of default, for example, 15 per cent of the notional value of the reference asset. The treatment of credit default swaps could differ from a guarantee depending upon the definition of default, the term, and the extent of coverage.

*Credit-Linked Notes*

In a credit-linked note, the beneficiary (Bank A) agrees to pay the guarantor (Bank B) the interest on an issued note referenced to a bond. The guarantor has in this case paid the principal on the note to the issuing bank. If there is no default on the reference bond, the note simply matures at the end of the period. If a credit event occurs on the bond, the note is redeemed, based on the default recovery.



A credit-linked note is a securitized version of a credit default swap. The difference between a credit default swap and a credit-linked note is that the beneficiary bank receives the principal payment from the guarantor when the contract is originated.

Through the purchase of the credit-linked note, the guarantor (Bank B) assumes the risk of the bond and funds this exposure through the purchase of the note. The guarantor bank takes on the exposure to the beneficiary (Bank A) to the full amount of the funding it has provided. The beneficiary bank hedges its risk on the bond without acquiring any additional credit exposure. Many variations of this product are available.

### *Credit Spread Products*

Credit derivative products can also go beyond the credit transfer products described above to include various forms of credit spread products or index related products. These types of instruments tend not to be credit risk management vehicles but rather options that are traded on the credit quality or credit migration of the underlying assets. In these cases, the bank is not transferring or hedging its risk but rather attempting to profit from changes in spreads. These products should be treated identically to other option products under CAR – Part II, Market Risk.

### Annex 3 - Netting of Trading Book Positions

There are three types of positions in credit derivatives against which banks hold risk-based capital for each of the three risk areas (specific risk, general market risk and counterparty credit risk). These three positions are: 1) matched positions; 2) offsetting positions; and 3) open positions. Matched positions encompass long and short positions in identical credit derivative structures over identical maturities referencing identical assets. Matching also requires that default definitions include the same credit events, materiality thresholds, and other relevant contract terms. Offsetting positions encompass long and short credit derivative positions in reference assets of the same obligor with the same level of seniority in bankruptcy. Offsetting positions include positions that would otherwise be matched except that the long and short credit derivative positions have different maturities or one leg is a total return swap and the other is a default product. Open positions are those that do not qualify as matched or offsetting positions.

#### Credit Derivatives Market Risk Capital Framework

	<b>Counterparty Credit Risk</b>	<b>General Market Risk</b>	<b>Specific Risk</b>
<b>Open Position</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Matched Position</b>	<b>Yes</b>	<b>No</b>	<b>No</b>
<b>Offsetting Position</b>	<b>Yes</b>	<b>Yes (Reduced)</b>	<b>Yes (Reduced)</b>

From the table above, it is clear that all credit derivative positions have counterparty risk. For matched positions, the counterparty credit risk is the only risk present. Fully matched positions eliminate both the general market risk and the specific risk. Both open and offsetting positions have all three risk elements present, but general market risk and specific risk are reduced in offsetting positions.

## Annex 4 - Summary of Capital Treatments

BANKING BOOK	Guarantor	Beneficiary
<b>Total Return Swap</b>	Hold capital against risk weight of reference asset.	Reduces risk weight on asset to that of the guarantor - add-on for maturity mismatch.
<b>Credit Default Swap</b>	Hold capital against risk weight of reference asset.	Reduces risk weight on asset to that of the guarantor - add-on for maturity mismatch.
<b>Credit-Linked Note</b>	Hold capital against the higher of risk weight of reference asset or the risk weight of the obligor (limited to the funded amount).	Cash received, if qualifying collateral, is risk weighted at zero per cent - add-on for maturity mismatch.

TRADING BOOK (standardized approach)		Guarantor	Beneficiary
<b>Total Return Swap</b>	General Market Risk	Long or short position in the reference asset and a short or long position in the notional bond (interest rate leg of contract).	Long or short position in the reference asset and a short or long position in the notional bond (interest rate leg of contract).
	Specific Risk	Long position(s) in the reference asset(s).	Short position(s) in the reference asset(s).
<b>Credit Default Swap</b>	General Market Risk	Normally no risk from market movements.	Normally no risk from market movements.
	Specific Risk	Long position(s) in the reference asset(s).	Short position(s) in the reference asset(s).
<b>Credit-Linked Note</b>	General Market Risk	Long position in the note.	No risk from market movements.
	Specific Risk	Long position(s) in the reference asset(s) plus long position on the note issuer.	Short position(s) in the reference asset(s).

Note: All contracts in trading book are subject to counterparty credit risk with "equity add-ons" applying to "qualifying" counterparties and "commodity add-ons" applying to "other" counterparties.

## **Annex 5 - Definitions**

### Basket

A set of related instruments whose prices or rates are used to create a synthetic (composite) instrument.

### Beneficiary, Protection Buyer, Credit Risk Seller

Terms that are used interchangeably when describing the counterparty that owns the asset and benefits from the protection provided by the credit derivative.

### Credit Event

Credit default products are structured so that a payout occurs only when a pre-defined credit event (or one of several such events) occurs. Credit events will normally include bankruptcy, liquidation and any payment default on the reference asset, but may also include lesser events such as rescheduling or rating downgrades. In some contracts a pre-determined materiality (or loss) threshold may also trigger payment.

### Guarantor, Protection Seller, Credit Risk Buyer

Terms that are used interchangeably when describing the counterparty who is providing the protection against a potential default or taking on the risk of an asset they do not own.

### Long Position

The position of the holder or buyer of a security or other instrument, or a position that appreciates in value when market prices increase.

### Recovery Value

The reference asset will normally retain some value after a credit event has triggered the settlement of a contract. Where payment under the contract is based on the recovery value, this is normally determined at a date up to three months after the credit event by means of a dealer poll or auction.

Reference Asset

The asset or assets whose credit risk is transferred. This may be a loan, security or other obligation, or a basket containing obligations of a single borrower or several borrowers that are named in the credit derivative contract.

Short Position

A position whereby an investor incurs rights and obligations that mirror the characteristics of another counterparty's asset position, or a position that appreciates in value when the underlying market price decreases.

Underlying Asset

The credit derivative may be used to hedge another position in an asset that is the same or similar to the reference asset. The position that the institution is attempting to hedge is referred to as the underlying asset.