<u>**Completion Instructions**</u>

Return of Capital Adequacy Ratio
Part IV – Risk-weighted Amount for Market Risk
<u>**Form MA(BS)3(IV)**</u>

<u>**Introduction**</u>

1.   Form MA(BS)3(IV) should be completed on a quarterly basis by each authorized institution incorporated in Hong Kong which is not exempted by the Monetary Authority (MA) from the calculation of *market risk*. The MA will not grant any exemption to an institution using the *internal ratings-based approach* (*IRB approach*) to calculate its *credit risk*, no matter whether it meets the de minimis exemption criteria.

2.   A reporting institution which is exempted by the MA from the calculation of market risk should complete this Form once in a year for the *position* at the last calendar day of December for the annual assessment of its exemption status. However, the *risk-weighted amount for market risk* reported in this Form by an exempted institution will be for information only, and will be automatically excluded from the calculation of its capital adequacy ratio in Part I of the Return. An exempted institution should continue to calculate the <u>credit risk</u> for its relevant market risk positions and complete Form MA(BS)3(IIIa), MA(BS)3(IIIb) or MA(BS)3(IIId) of the Return, whichever is applicable, in the same manner as the credit risk for those positions is calculated and reported at other quarter-ends. A newly authorized institution is required to report its market risk positions for the first four consecutive *calendar quarters* before the MA can make the first assessment on whether the institution qualifies for the exemption status. This Form and its completion instructions should be read in conjunction with the Banking (Capital) Rules (such as the interpretation for the terms in bold and italic) and the relevant supervisory guidelines relating to the market risk capital framework.

<u>**Section A: Definitions and Clarification**</u>

3.   A reporting institution should use the *standardized (market risk) approach* (*STM approach*) to calculate its market risk unless it has obtained the MA's approval to use the *internal models approach* (*IMM approach*) or the approach adopted by its *parent bank*. The MA may also approve a reporting institution to use the IMM approach to calculate its market risk in respect of *general market risk* or *specific risk*, or both, for such *risk categories* or such local or overseas business of the institution specified by the MA (see paragraph 7). Any reporting institution which has been approved by the MA to use the IMM approach to calculate its market risk cannot revert to the STM approach, except with the MA's *prior consent*.

4.   Subject to paragraph 5, a reporting institution should calculate its market risk to take into account the risk of losses arising from fluctuations in the value of:

(a)   the institution's **trading book** positions held in **debt securities**, **debt-related derivative contracts**, **interest rate derivative contracts**, **equities** and **equity-related derivative contracts**; and

(b)   the institution's positions held in foreign exchange (including gold), **exchange rate-related derivative contracts**, **commodities** and **commodity-related derivative contracts**.

5.   A reporting institution should not include a position in the calculation of its market risk if the position is:

(a)   a **recognized credit derivative contract** booked in the institution's trading book as a hedge to a credit exposure booked in the institution's **banking book**; or

(b)   an exposure required to be deducted from any of the institution's **core capital** and **supplementary capital** in Part II of the Return of Capital Adequacy Ratio.

6.   A reporting institution should value its positions, whether based on a **marking-to-market** or **marking-to-model** methodology, in a prudent manner (including by taking into account the liquidity of the positions).

7.   A reporting institution should complete various divisions of this Form according to the following instructions:

(a)   for the reporting institution using the STM approach, it should complete Divisions A to E and Division G of the Form;

(b)   for the reporting institution using the IMM approach, it should complete Divisions F to G of the Form;

(c)   for the reporting institution using a combination of the IMM approach and STM approach, it should complete Divisions A to G of the Form; and

(d)   for the reporting institution using the approach adopted by its parent bank, it should separately agree with the MA the reporting contents and basis.

8.   The guidance for the calculation of **market risk capital charge** for **credit derivative contracts** booked in a reporting institution's trading book is set out in **Annex IV-A**.

9.   An illustration based on a hypothetical portfolio on how various types of **financial instruments** are reported and how market risk capital charges are calculated under the STM approach is shown in **Annex IV-B**.

Section B: STM Approach to the Calculation of Market Risk

10. Unless otherwise specified, a reporting institution should use the *fair value* of its positions to calculate the market risk capital charge. Where the stated *notional amount* of an exposure held by a reporting institution is leveraged or enhanced by the structure of the exposure, the institution should use the effective notional amount of the exposure (being the stated notional amount of the exposure adjusted to take into account the effect of the leverage or enhancement provided by the structure of the exposure) for the purpose of calculating the market risk capital charge.

B.1 Interest Rate Exposures (Trading Book)

11. This subsection describes the framework for calculating the market risk capital charge for a reporting institution's interest rate exposures booked in the trading book. The calculation treatment of interest rate exposures relating to *option contracts* is separately described in section B.5.

12. A reporting institution should, for the purposes of calculating the market risk capital charge for its interest rate exposures:

    (a) calculate the market risk capital charge for specific risk of each of its trading book positions (whether long or short) in debt securities and debt-related derivative contracts; and

    (b) calculate the market risk capital charge for general market risk of:

       (i) its trading book positions (whether long or short) in debt securities, debt-related derivative contracts and interest rate derivative contracts;

       (ii) the interest rate exposures arising from its trading book positions (whether long or short) in equity-related derivative contracts; and

       (iii) the interest rate exposures arising from its positions (whether long or short) in commodity-related derivative contracts.

13. A reporting institution should follow section 76 of the Rules for the calculation of the *risk-weighted amount* of *repo-style transactions* booked in the trading book.

B.1.1 Debt securities and debt-related derivative contracts - specific risk

14. A reporting institution should assign each of its trading book positions (whether long or short) in debt securities and debt-related derivative contracts into items 1.1 to 1.13 of Division A.1 of the Form based on the classes, the *credit quality grades* and, if applicable, the residual maturities of such positions in accordance with **Table 1**.

15. The reporting institution should then multiply the total positions (i.e. long plus short positions) for each column by the appropriate *market risk capital charge factors* for specific risk specified in Division A.1 of the Form. The total market risk capital charge for specific risk equals to the sum of the market risk capital charge for specific risk of each column.

Table 1: Market risk capital charge factors for specific risk

Class	Credit quality grade	Market risk capital charge factor for specific risk
Sovereign	1	0%
	2 or 3	0.25% (residual maturity of not more than 6 months)
		1.00% (residual maturity of more than 6 months but not more than 24 months)
		1.60% (residual maturity of more than 24 months)
	4 or 5	8.00%
	6	12.00%
	Unrated	8.00%
Qualifying		0.25% (residual maturity of not more than 6 months)
		1.00% (residual maturity of more than 6 months but not more than 24 months)
		1.60% (residual maturity of more than 24 months)
Non-qualifying	4	8.00%
	5	12.00%
	Unrated	8.00%

16. A reporting institution should not offset between positions in debt securities and debt-related derivative contracts except for:

   (a)   long and short positions in identical issues (including positions in *derivative contracts*) with the same issuer, coupon, currency and maturity; and

   (b)   credit derivative contracts set out in paragraphs 12 to 14 of **Annex IV-A**.

17. For the purposes of paragraph 15, if:

(a)   the issuer of any debt securities or, in the case of debt-related derivative contracts, the issuer of any underlying debt securities, has an ***ECAI issuer rating***; or

(b)   any debt securities or, in the case of debt-related derivative contracts, any underlying debt securities, have an ***ECAI issue specific rating***,

a reporting institution should, subject to paragraphs 18 to 20, map the ECAI issuer rating or the ECAI issue specific rating, as the case may be, to a scale of credit quality grades in accordance with the tables set out in Annex IIIb-A of the completion instructions for Part IIIb of the Return of Capital Adequacy Ratio.

18.   Subject to paragraph 20, in the case of debt securities issued by a sovereign or, in the case of debt-related derivative contracts where the underlying debt securities are issued by a sovereign, a reporting institution should determine the credit quality grade by reference to the ECAI issuer rating of that sovereign. In this context, "***sovereign***" includes a ***sovereign foreign public sector entity***.

19.   Subject to paragraph 20, in the case of non-sovereign debt securities or non-sovereign debt-related derivative contracts, a reporting institution should determine the credit quality grade by reference to, in the case of debt securities, the ECAI issue specific rating of the debt securities or, in the case of debt-related derivative contracts, the ECAI issue specific rating of the underlying debt securities.

20.   The institution should treat as unrated:

(a)   the issuer of any debt securities or, in the case of debt-related derivative contracts, the issuer of any underlying debt securities, referred to in paragraph 18, which does not have an ECAI issuer rating; and

(b)   any debt securities or, in the case of debt-related derivative contracts, any underlying debt securities, referred to in paragraph 19, which do not have an ECAI issue specific rating.

21.   A reporting institution may assign a market risk capital charge factor of 0% to:

(a)   debt securities issued by a sovereign with a credit quality grade of 2 or 3 as determined under paragraph 18; or

(b)   debt-related derivative contracts in respect of which the underlying debt securities are issued by a sovereign with a credit quality grade of 2 or 3 as determined under paragraph 18,

if those debt securities or, in the case of those debt-related derivative contracts, those underlying debt securities, as the case may be, are denominated in the domestic currency of that sovereign and funded by the institution in that currency.

22.   A reporting institution may only include in the qualifying class under items 1.6 to 1.10 of Division A.1 of the Form:

(a)   debt securities issued by multilateral development banks and debt-related derivative contracts where the underlying debt securities are issued by multilateral development banks;

(b)   debt securities, not falling within paragraph (a), which are rated *investment grade* and debt-related derivative contracts where the underlying debt securities, not falling within paragraph (a), which are rated investment grade; and

(c)   if the institution uses the IRB approach to calculate its credit risk, unrated debt securities, and debt-related derivative contracts if the underlying debt securities are unrated, where:

  (i)   the debt securities, or the underlying debt securities, as the case may be, are assessed as equivalent to investment grade under the institution's *rating system* on the basis that the debt securities, or the underlying debt securities, as the case may be, have a *PD* assigned by the institution's rating system of not more than the PD implied by the long run average PD (being a period which captures a reasonable mix of high-default and low-default years of an economic cycle) of a debt security rated investment grade; and

  (ii)   the issuer of the debt securities, or the issuer of the underlying debt securities, as the case may be, has any debt securities or equities listed on a *recognized stock exchange* or is subject to supervisory arrangements regarding the maintenance of adequate capital to support its business activities comparable to those prescribed for authorized institutions under the Banking Ordinance and the Rules.

23.   A reporting institution should include in the non-qualifying class under items 1.11 to 1.13 of Division A.1 of the Form any non-sovereign debt securities or non-sovereign debt-related derivative contracts which are not included in the qualifying class under paragraph 22.

24.   If:

(a)   the issuer of any debt securities or, in the case of any debt-related derivative contracts, the issuer of any underlying debt securities, has more than one ECAI issuer rating assigned to the issuer; or

(b)   any debt securities or, in the case of any debt-related derivative contracts, any underlying debt securities, have more than one ECAI issue specific rating assigned to them,

a reporting institution should apply the principles set out in section 69(2) of the Rules to the *ECAI ratings* concerned to ascertain which one of them should be used.

25.　If the MA is satisfied that a reporting institution's market risk capital charge for specific risk is underestimated for any non-qualifying debt securities or debt-related derivative contracts which have a high yield to redemption relative to any debt securities issued by a sovereign or any debt-related derivative contracts where the underlying debt securities are issued by a sovereign, the MA may:

(a)　require the institution to apply a higher market risk capital charge factor for specific risk to such non-qualifying debt securities or debt-related derivative contracts, as the case may be;

(b)　prohibit offsetting, for the purposes of calculating the institution's market risk capital charge for general market risk between such non-qualifying debt securities or debt-related derivative contracts and any other debt securities or debt-related derivative contracts.

The market risk capital charge factor for specific risk specified by the MA for such non-qualifying debt securities or debt-related derivative contracts should be reported under the column "To be specified (　%)" of Division A.1 of the Form.

26.　Interest rate derivative contracts are not subject to a market risk capital charge for specific risk.

B.1.2　Debt securities, debt-related derivative contracts and interest rate derivative contracts - general market risk

<u>Construction of maturity ladder</u>

27.　A reporting institution should construct a maturity ladder for each currency in which its interest rate exposures are denominated according to the time bands provided in Division A.2 of the Form.

28.　The reporting institution should slot all of its long or short positions in debt securities, debt-related derivative contracts, interest rate derivative contracts and interest rate exposures arising from equity-related derivative contracts and commodity-related derivative contracts:

(a)　with a coupon of not less than 3% per annum into a maturity ladder comprising the 13 time bands set out in **<u>Table 2</u>**; and

(b)　with a coupon of less than 3% per annum into a maturity ladder comprising the 15 time bands set out in **<u>Table 2</u>**.

Table 2: Time bands and risk-weights

Time band	Coupon of not less than 3% per annum	Coupon of less than 3% per annum	Risk-weight
1	≤ 1 month	≤ 1 month	0.00%
2	> 1 to 3 months	> 1 to 3 months	0.20%
3	> 3 to 6 months	> 3 to 6 months	0.40%
4	> 6 to 12 months	> 6 to 12 months	0.70%
5	> 1 to 2 years	> 1.0 to 1.9 years	1.25%
6	> 2 to 3 years	> 1.9 to 2.8 years	1.75%
7	> 3 to 4 years	> 2.8 to 3.6 years	2.25%
8	> 4 to 5 years	> 3.6 to 4.3 years	2.75%
9	> 5 to 7 years	> 4.3 to 5.7 years	3.25%
10	> 7 to 10 years	> 5.7 to 7.3 years	3.75%
11	> 10 to 15 years	> 7.3 to 9.3 years	4.50%
12	> 15 to 20 years	> 9.3 to 10.6 years	5.25%
13	> 20 years	> 10.6 to 12 years	6.00%
14		> 12 to 20 years	8.00%
15		> 20 years	12.50%

29.   For the purposes of paragraph 28, the reporting institution should slot fixed rate exposures into the time bands set out in **Table 2** in accordance with their respective residual maturities and slot floating rate exposures into the time bands set out in **Table 2** in accordance with their respective residual terms to the next interest fixing date.

30.   The reporting institution should regard interest rate exposures arising from derivative contracts as a combination of the long and short positions in accordance with paragraphs 31 to 34 and slot such positions into the time bands set out in **Table 2**.

31.   Interest rate *futures contracts*, interest rate *forward contracts* and forward rate agreements are treated as a combination of the long and short positions in a zero-coupon *specific risk-free security* whereby:

(a)   a long or short position in an interest rate futures contract or interest rate forward contract is to be regarded as:

(i)   a short or long position respectively with a maturity being the remaining period up to and including the delivery date of the underlying interest rate contract; and

(ii)   a long or short position respectively with a maturity being the remaining period up to and including the delivery date of the underlying interest rate contract plus the contract period of the underlying interest rate contract. For example, a long position in a June three-month interest rate futures contract taken in December is to be reported at the end of December as a long position in a zero-coupon specific risk-free security in that particular currency with a maturity of

nine months and a short position in a zero-coupon specific risk-free security with a maturity of six months (see example (5) in **Annex IV-B**); or

(b)   a sold or purchased forward rate agreement is to be regarded as:

    (i)   a short or long position respectively with a maturity being the remaining period up to and including the settlement date of the agreement; and

    (ii)   a long or short position respectively with a maturity being the remaining period up to and including the settlement date of the agreement plus the contract period of the agreement.

32.   ***Bond*** futures contracts and bond forward contracts are treated as a combination of the long and short positions in a zero-coupon specific risk-free security and the underlying bond whereby a long or short position in a bond futures contract or bond forward contract is to be regarded as:

(a)   a short or long position respectively in a zero-coupon specific risk-free security with a maturity being the remaining period up to and including the delivery date of the underlying bond; and

(b)   a long or short position respectively in the underlying bond with a maturity being the remaining period up to and including the delivery date of the underlying bond plus the tenor of the underlying bond.

33.   Forward foreign exchange contracts in the trading book are regarded as a long and a short position in a zero-coupon specific risk-free security of two different currencies with the same maturity as forward contracts (see example (8) in **Annex IV-B**).

34.   Interest rate ***swap contracts*** under which a reporting institution receives or pays floating rate interest and pays or receives respectively fixed rate interest are to be regarded as:

(a)   a short or long position respectively in a fixed rate instrument with a maturity being the remaining period up to and including the maturity date of the swap contract concerned ; and

(b)   a long or short position respectively in a floating rate instrument with a maturity being the remaining period up to and including the next interest fixing date (see example (4) in **Annex IV-B**).

For swap contracts that pay or receive fixed or floating rate interest against some other reference price (e.g. an equity price), the interest rate leg should be slotted into the time bands of Division A.2 of the Form according to the residual terms to the next interest fixing date, with the equity leg being included in the equity framework set out in Division B of the Form. The separate legs of cross-currency swap contracts should be slotted in the relevant maturity ladders for the currencies concerned.

35.	In calculating the market risk capital charge for general market risk, the reporting institution may exclude from the maturity ladder long and short positions in identical instruments having the same issuer, coupon, currency and maturity. The institution may fully offset the *matched positions* in a futures contract or forward contract and the *underlying exposure* of the futures contract or forward contract, as the case may be, except that the position in a zero-coupon specific risk-free security should be included in the calculation of the institution's market risk capital charge for general market risk. For example, if a reporting institution has a long position in a bond and sells the bond in a futures contract or forward contract as at the reporting date, the long and short positions in the bond can be offset but a long position in a zero-coupon specific risk-free security with a maturity being the remaining period up to and including the delivery date of the underlying bond of the futures contract or forward contract should be reported based on the fair value of the bond.

36.	In the case of a futures contract or forward contract comprising a range of deliverable bonds, a reporting institution may only offset positions in the contract and the underlying bond which is readily identifiable as the most profitable for the institution with a short position to deliver (i.e. the cheapest to deliver). This means that offsetting is only permitted between a short futures contract or forward contract and a long bond (i.e. not between a long futures contract or forward contract and a short bond) and the bond should be the "cheapest to deliver" bond among the range of deliverable bonds under the contract. The amount to be reported for the remaining long position of the contract, up to and including the delivery date of the contract, should be the face value of the contract divided by the *conversion factor* applicable to the contract and multiplied by the current market price of that bond. For example, a short position in a futures contract on a five-year fixed rate bond with delivery three months from the reporting date is to be reported as a short position in a 5.25 year bond (i.e. a specific bond which is within the range of deliverable bonds under the futures contract) and a long position in a three-month zero-coupon specific risk-free security. The amount to be reported for both legs is the contract face value divided by the conversion factor applicable to the contract and multiplied by the current market price of the selected deliverable bond (see example (3) in **Annex IV-B**).

37.	A reporting institution may treat opposite positions in the same type of derivative contracts (including the *delta-weighted position* of option contracts calculated according to section B.5) as matched and may fully offset them. For this purpose, positions in the same type of derivative contracts are opposite only if:

	(a)	the positions relate to derivative contracts with the same underlying exposures, are of the same nominal value and denominated in the same currency;

	(b)	in the case of futures contracts, the offsetting positions in the underlying interest rate exposures to which the futures contracts relate are for identical exposures and mature within 7 days of each other;

	(c)	in the case of swap contracts and forward rate agreements, the rates (for floating rate positions) of the contracts or agreements, as the case may be, are identical and the coupons are within 15 basis points; and

(d)   in the case of swap contracts, forward rate agreements and forward contracts, the next interest fixing date or, for fixed coupon positions or forward contracts, the residual maturity, corresponds within the following limits:

 (i)   if either of the contracts or agreements, as the case may be, to be offset has an interest fixing date or residual maturity of not more than one month, the interest fixing date or residual maturity, as the case may be, is the same for both contracts or agreements, as the case may be;

 (ii)   if either of the contracts or agreements, as the case may be, to be offset has an interest fixing date or residual maturity of more than one month but not more than one year, the interest fixing dates or residual maturities, as the case may be, are within 7 days of each other; and

 (iii)   if either of the contracts or agreements, as the case may be, to be offset has an interest fixing date or residual maturity of more than one year, the interest fixing dates or residual maturities, as the case may be, are within 30 days of each other.

For example, a bought and a sold forward rate agreement in the same currency with the same face value, settlement date and deposit maturity date may be offset against each other and excluded from reporting if the contract rates are within 15 basis points of each other. Similarly, opposite swap contracts may be offset if, say, the floating rate in both cases is six month HIBOR and the fixed rates are within 15 basis points of each other. The positions may also be offset if the reference dates (i.e. the residual term to the next interest fixing date or the residual maturity of each contract) of the opposite positions are different but within the range set out in item (d) above. Opposite bond futures contracts may be offset against each other if the deliverable bonds are of the same type and mature within 7 days of each other.

Calculation of market risk capital charge for general market risk

38.   A reporting institution should calculate the market risk capital charge for general market risk by:

(a)   multiplying its long and short positions in interest rate exposures in each time band within the maturity ladder by the appropriate risk-weight as set out in Division A.2 of the Form;

(b)   offsetting the total risk-weighted long and short positions in each time band to produce a single net risk-weighted long or short position for each time band;

(c)   applying a market risk capital charge factor of 10% on the matched position (being the lesser of the absolute values of the total risk-weighted long and short positions) of each time band, whether long or short, to arrive at a market risk capital charge for each matched position (referred to as "vertical disallowance"). For example, if the sum of the total risk-weighted long position in a time band is $100 million and the sum of the total risk-weighted

short position in the same time band is $90 million, the vertical disallowance would be 10% of $90 million (i.e. $9 million). The $9 million will be included in the calculation of market risk capital charge for general market risk;

(d)   subject to paragraph 39:

    (i)   first conducting a round of horizontal offsetting between the net risk-weighted positions for the time bands in each of the 3 zones subject to a scale of market risk capital charge factors, expressed as a percentage of the matched positions for each zone, as set out in **Table 3**;

    (ii)   then conducting a round of horizontal offsetting between the total net risk-weighted positions for the zones across the 3 zones (being between adjacent zones and between zone 1 and zone 3) subject to a scale of market risk capital charge factors, expressed as a percentage of the matched positions between the zones, as set out in **Table 3,**

to arrive at a market risk capital charge for each matched position (referred to as "horizontal disallowance"); and

(e)   applying a market risk capital charge factor of 100% on the remaining net risk-weighted long or short position in interest rate exposures after carrying out the offsetting in accordance with items (b) and (d) above.

Table 3: Horizontal disallowance

| Zone | Time band | | Market risk capital charge factor | | |
	Coupon of not less than 3% per annum	Coupon of less than 3% per annum	Within the zone	Between adjacent zones	Between zones 1 and 3
Zone 1	≤ 1 month > 1 to 3 months > 3 to 6 months > 6 to 12 months	≤ 1 month > 1 to 3 months > 3 to 6 months > 6 to 12 months	40%	40%	100%
Zone 2	> 1 to 2 years > 2 to 3 years > 3 to 4 years	> 1.0 to 1.9 years > 1.9 to 2.8 years > 2.8 to 3.6 years	30%		
Zone 3	> 4 to 5 years > 5 to 7 years > 7 to 10 years > 10 to 15 years > 15 to 20 years > 20 years	> 3.6 to 4.3 years > 4.3 to 5.7 years > 5.7 to 7.3 years > 7.3 to 9.3 years > 9.3 to 10.6 years > 10.6 to 12 years > 12 to 20 years > 20 years	30%		

39. For the purposes of:

(a) a reporting institution conducting the first round of horizontal offsetting under paragraph 38(d)(i), the institution should:

(i) calculate the net risk-weighted long or short position of each time band after separately adding long positions to long positions and short positions to short positions;

(ii) in the case of long and short positions in the same zone, subject the matched position (being the lesser of the absolute values of the total net risk-weighted long and short positions for the zone) to a market risk capital charge factor of 40% for zone 1 and 30% for zone 2 and zone 3; and

(iii) offset the positions of time bands within the same zone to create the matched position to which the market risk capital charge factor is applied under item (ii) above and a total net risk-weighted long or short position for each zone;

(b) a reporting institution conducting the second round of horizontal offsetting under paragraph 38(d)(ii), the institution should:

(i) in the case of opposite positions between adjacent zones (being one zone having a total net risk-weighted long position while another zone having a total net risk-weighted short position), subject the matched position (being the lesser of the absolute values of the total net risk-weighted long position in one zone and the total net risk-weighted short position in another zone) to a market risk capital charge factor of 40%;

(ii) offset the positions between adjacent zones to create the matched position to which the market risk capital charge factor is applied under item (i) above and a total net risk-weighted long or short position;

(iii) subject to item (iv) below, in the case of opposite positions between zone 1 and zone 3, subject the matched position (being the lesser of the absolute values of the total net risk-weighted long or short position in zone 1 and the total net risk-weighted short or long position respectively in zone 3) to a market risk capital charge factor of 100%; and

(iv) in order to calculate the horizontal disallowance between zone 1 and zone 3 for item (iii) above:

(A) if the total net risk-weighted positions of zone 1 and zone 2 are netted, treat the net position as the remaining position of zone 1;

(B) if the total net risk-weighted positions of zone 2 and zone 3 are netted, treat the net position as the remaining position of zone 3.

40. A reporting institution should derive the market risk capital charge for general market risk for its portfolio of interest rate exposures by aggregating:

(a) the total market risk capital charge for vertical disallowance for all time bands calculated in accordance with paragraph 38(c);

(b) the total market risk capital charge for horizontal disallowance for individual zones and across different zones calculated in accordance with paragraph 38(d); and

(c) the market risk capital charge for the remaining net risk-weighted long or short position calculated in accordance with paragraph 38(e).

See **Annex IV-C** for a numerical illustration of the composition of the market risk capital charge for general market risk for interest rate exposures.

41. A reporting institution should calculate the market risk capital charge for general market risk for each currency separately, convert each amount so calculated into HKD at current market rates and then aggregate the amounts so calculated. In other words, a reporting institution should use separate forms to report the positions in HKD for different currencies in Division A.2 of the Form.

Other alternative methods

42. A reporting institution should use the above methodology to calculate its positions to be included in the maturity ladder unless it has the prior consent of the MA to use a different methodology. For example, a reporting institution with a large portfolio of swap contracts may, subject to the MA's prior consent, use an alternative methodology to calculate the position of these contracts to be included in the maturity ladder. One method is to first convert the payments required by the swap contract into the present values. For this purpose, each payment should be discounted using zero-coupon yields and a single net figure for the present value of the cash flows should be entered into the appropriate time band of the maturity ladder.

43. A reporting institution should use the *maturity method* set out in paragraphs 27 to 41 to calculate the market risk capital charge for general market risk for its portfolio of interest rate exposures unless it has the prior consent of the MA to use a different method such as the duration method. The duration method is set out in paragraph 718(vii) of "International Convergence of Capital Measurement and Capital Standards: A Revised Framework (Comprehensive Version)" issued by the Basel Committee on Banking Supervision in June 2006. A reporting institution wishing to use this method should possess the necessary capability to calculate the duration and price sensitivity of each position separately.

B.2   Equity Exposures (Trading Book)

44.   This subsection describes the framework for calculating the market risk capital charge for a reporting institution's equity exposures booked in the trading book. The calculation treatment of equity exposures relating to option contracts is separately described in section B.5.

45.   A reporting institution should, for the purposes of calculating the market risk capital charge for its trading book positions (whether long or short) in equities and equity-related derivative contracts:

(a)   calculate the market risk capital charge for specific risk of each of those positions; and

(b)   calculate the market risk capital charge for general market risk of those positions.

46.   For the purpose of paragraph 45, a reporting institution should report in Division B of the Form each of its positions in equities and equity-related derivative contracts for each exchange where the equities or, in the case of equity-related derivative contracts, the underlying equities concerned are listed or traded (i.e. on an exchange-by-exchange basis). In other words, the positions should be reported under separate columns according to where the equities concerned are listed or traded. For overseas markets, a reporting institution should indicate the *country* where the exchange is located in the space provided. If an equity is listed on more than one exchange, it should be reported in the exchange of its primary listing.

47.   A reporting institution should convert its equity-related derivative contracts into positions in the underlying equity by:

(a)   valuing its futures contracts and forward contracts relating to an individual equity at the fair value of the underlying equity;

(b)   valuing its futures contracts relating to equity indices as the current index value multiplied by the monetary value of one index point set by the futures exchange where the futures contract is traded (i.e. the "tick" value, e.g. the Hang Seng Index Future is HK$50 per point) or the fair value of the underlying basket of equities used to compile the index (see example (11) in **Annex IV-B**).

48.   A reporting institution should regard each of its equity swap contracts as long and short positions such that:

(a)   in the case of an equity swap contract in which the institution:

(i)   is receiving an amount based on the change in value of a particular equity or equity index; and

(ii)   is paying an amount based on the change in value of a different equity or equity index,

the position in item (i) above is the long position and the position in item (ii) above is the short position, of the equity swap contract; and

(b)   in the case of an equity swap contract which involves a position requiring the receipt or payment of fixed or floating rate interest, the institution treats the position under the maturity method and reports in Division A.2 of the Form according to the instructions set out in section B.1.2.

49.   If equities are to be received or delivered under a forward contract, the institution should treat any interest rate exposure arising out of the contract under the maturity method and report in Division A.2 of the Form according to the instructions set out in section B.1.2. A reporting institution should also treat any interest rate exposure arising out of an equity futures contract or any equity index futures contract under the maturity method and report in Division A.2 of the Form according to the instructions set out in section B.1.2.

50.   A reporting institution may fully offset its matched positions in each identical equity or equity index with the same delivery month in each exchange in order to produce a single net long or short position. A futures contract in a given equity can also be offset against an opposite position in the same equity. However, in these two cases, the market risk capital charge for general market risk for any interest rate exposure arising out of such contracts should be calculated under the maturity method and reported in Division A.2 of the Form. For example, a short futures contract on an equity with delivery 3 months from the reporting date can be offset against a long position in the underlying equity. However, the interest rate exposure arising out of the equity futures contract should be reported as a long position in a three-month zero-coupon specific risk-free security at the fair value of the equity denominated in the same currency as the equity.

51.   A reporting institution should calculate the market risk capital charge for specific risk of the institution's trading book positions in equities and equity-related derivative contracts as 8% of its total gross (long plus short) position. The institution should also calculate the market risk capital charge for general market risk of the institution's trading book positions in equities and equity-related derivative contracts as 8% of its total net position in equities and equity-related derivative contracts (being the difference between the sum of the institution's long positions and the sum of the institution's short positions). The institution should not offset net long and short positions on different exchanges.

B.3   Foreign Exchange Exposures

52.   This subsection describes the framework for calculating the market risk capital charge for a reporting institution's foreign exchange exposures (including gold). The calculation treatment of foreign exchange exposures relating to option contracts is separately described in section B.5.

53.   A reporting institution should, for the purposes of calculating the market risk capital charge for its positions in foreign exchange (including gold) and exchange rate-related derivative contracts, determine the amount of its net open position (being the sum of the net spot position and the net forward position) in each currency and in gold. Subject to any applicable adjustments specified in paragraphs 5(b), 53a and 54, the amounts should be based on the sum of the figures reported under, where applicable, columns 5 (Hong Kong office), 7 (overseas branches) and 8 (subsidiaries) of Part I of the Return of Foreign Currency Position (Form MA(BS)6), but reported in thousand Hong Kong dollars. The institution should convert each amount into HKD at current market rates for reporting purposes. Positions arising from foreign currency option contracts should be reported for each currency, subject to the instructions set out in section B.5.

53a.   Where a reporting institution has reported positions in "structural assets (liabilities)" in columns 6 or 10 of Part I of the Return of Foreign Currency Position (Form MA(BS)6), the reported figures should be added to those reported under, where applicable, columns 5, 7 and 8 of Part I of the same Return for the purposes of determining the amount of the institution's net open position in each currency and in gold as mentioned in paragraph 53 above.

54.   Where a reporting institution has maintained *structural positions* for regulatory capital purposes, the institution should not exclude any of such structural positions from the calculation of market risk capital charge for its foreign exchange exposures except after consultation with the MA. In this regard, "structural position" means a position in foreign exchange held by the institution with the intention of hedging any adverse effect of exchange rate movements on its capital adequacy ratio.

55.   The "sum of net long/short positions" of a reporting institution is the sum of:

(a)   its total net long or net short position in each foreign currency (including gold and, if applicable, the net delta-weighted position of option contracts in each such currency); and

(b)   its "HKD position", which is a balancing figure to ensure that the total of all net long positions for all currencies is the same as the total of all net short positions for all currencies.

56.   The "USD/HKD position" of the reporting institution is:

(a)   zero if the institution's net open positions in USD and HKD are both long or both short;

(b)   the smaller of the 2 positions (expressed as the absolute value) if the institution's net open positions in USD and HKD are opposite positions.

57.   The "adjusted sum of net long/short positions" of the reporting institution is equal to the "sum of net long/short positions" less its "USD/HKD position".

58.   The reporting institution's "total net open position" is derived by aggregating:

(a)   its "adjusted sum of net long/short positions; and

(b)   the institution's net position in gold (whether long or short).

59.   The market risk capital charge for the reporting institution's positions in foreign exchange (including gold) is 8% of its "total net open position".

B.4   Commodity Exposures

60.   This subsection describes the framework for calculating the market risk capital charge for a reporting institution's commodity exposures.   The calculation treatment of commodity exposures relating to option contracts is separately described in section B.5.

61.   Long and short positions in commodities should be reported in Division D of the Form by the nature of items. A reporting institution should, for the purposes of calculating the market risk capital charge for its positions in commodities and commodity-related derivative contracts, convert its gross (long plus short) position in each commodity to which those positions relate (measured in barrels, kilograms or grams or such other standard unit of measurement as is applicable to the commodity concerned) into monetary terms at current market price of the commodity.

62.   A futures contract or forward contract relating to a commodity should be valued by reference to the notional amount of the standard unit of measurement of the commodity converted into monetary terms at current market price. Any interest rate exposure arising out of such commodity-related futures contract or forward contract should be dealt with under the maturity method and reported in Division A.2 of the Form according to the instructions set out in section B.1.2.

63.   In the case of a commodity swap contract under which one leg of the swap contract relates to a position or series of positions referenced to a fixed price and the other leg of the swap contract relates to a position or series of positions referenced to the current market price of a reference commodity or commodities, a reporting institution should, for each payment under the swap contract, value each of the positions at the notional amount of the swap contract. The institution should also treat each such position as long if the institution is paying at a fixed price and receiving at a floating market price and short if the institution is receiving at a fixed price and paying at a floating market price. If one of the legs of the swap contract involves receiving or paying at a fixed or

floating interest rate, that leg should be treated under the maturity method and reported in Division A.2 of the Form according to the instructions set out in section B.1.2.

64.   A reporting institution may offset long and short positions in the same commodity when calculating its open positions. Offsetting is, however, not allowed for positions in different types of commodities.

65.   A reporting institution should calculate the market risk capital charge for its commodity exposures as the sum of 15% of the institution's net position in each commodity to cover the risk of a change in the market price of the commodity and 3% of the institution's gross (long plus short) position in each commodity to cover:

(a)   the risk that the relationship between the prices of similar commodities changes over time;

(b)   the risk of a change in the cost of carry for forward positions and option contracts; and

(c)   the risk that the forward price may change for reasons other than a change in interest rates.

B.5   Option Exposures

66.   A reporting institution should, for the purposes of calculating the market risk capital charge for its option exposures to debt securities, interest rates, equities, foreign exchange (including gold) and commodities, use either the *simplified approach* or the *delta-plus approach*. A reporting institution should seek the prior consent of the MA if it wishes to adopt any approach other than the simplified approach or the delta-plus approach.

B.5.1   Simplified approach

67.   A reporting institution should not use the simplified approach to calculate the market risk capital charge for its option exposures unless the institution:

(a)   purchases option contracts but does not write option contracts; or

(b)   purchases option contracts and only writes option contracts that are fully hedged by matched long positions in the same option contracts.

The institution should exclude from the calculation the option contracts written by it and the corresponding purchased option contracts fully hedged by such written option contracts. Only its outstanding purchased option contracts should be used for the calculation of the market risk capital charge under the simplified approach.

68.   A reporting institution's positions in the outstanding purchased option contracts and the related underlying exposures of those option contracts are not subject to the

calculation methodologies set out in sections B.1 to B.4. These positions are "carved-out" and reported in Division E.1 of the Form, subject to separately calculated market risk capital charges that incorporate both specific risk and general market risk.

69.   A reporting institution should, for the purposes of calculating the market risk capital charge for its outstanding purchased option contracts (with or without related positions in the underlying exposures of those option contracts):

(a)   where the institution has:

   (i)   a long position in a put option contract and a long position in the underlying exposure of the put option contract; or

   (ii)   a long position in a call option contract and a short position in the underlying exposure of the call option contract,

   multiply the fair value of the position in the underlying exposure of the option contract by the sum of the market risk capital charge factors for general market risk and specific risk for the position in the underlying exposure of such option contract as set out in **Table 4** less the amount by which the option contract is in-the-money (if any). For example, if a reporting institution holding 100 shares currently valued at $10 each holds an equivalent put option contract with a strike price of $11, the market risk capital charge will be: $1,000 x 16% (8% specific risk plus 8% general market risk) = $160, less the amount by which the option contract is in-the-money ($11 - $10) x 100 = $100, that is, $60. Where the amount derived from the calculation is negative, the institution should treat the market risk capital charge for the relevant outstanding purchased option contract and the position in the underlying exposure of such option contract as zero;

(b)   where the institution has a long position in a call option contract or a long position in a put option contract, use the lesser of:

   (i)   the fair value of the underlying exposure of the option contract multiplied by the sum of the market risk capital charge factors for general market risk and specific risk for the underlying exposure of such option contract as set out in **Table 4**; and

   (ii)   the fair value of the option contract; and

(c)   calculate in a way such that:

   (i)   the market risk capital charge is calculated separately for individual option contracts but together with the related position in the underlying exposure of such option contracts;

   (ii)   the institution uses the sum of the market risk capital charge for individual option contracts to calculate the total market risk capital charge for its portfolio of option exposures.

Table 4: Market risk capital charge factor for each *risk category*

Risk category	Market risk capital charge factor for specific risk	Market risk capital charge factor for general market risk
Interest rate	As per the market risk capital charge factors for specific risk set out in **Table 1** according to the class, credit quality grade and residual maturity	As per the risk-weights set out in **Table 2** according to the residual maturity for fixed rate exposures or residual term to next interest fixing date for floating rate exposures and coupon rate
Equity	8.00%	8.00%
Foreign exchange	0.00%	8.00%
Commodity	0.00%	15.00%

70. If it is unclear to a reporting institution which side of an option contract purchased by it constitutes the underlying exposure, the institution should take the exposure which would be received by it if the option under the contract were exercised to be the underlying exposure. In addition, the nominal value should be used for option contracts where the market value of the underlying exposure could be zero, e.g. caps and floors, swaption contracts, etc.

71. For the purposes of calculating the market risk capital charge for an option contract purchased by the institution which has a residual maturity of more than 6 months, the strike price of the option contract should be compared with the forward price (i.e. not the current market price) of the underlying exposure of the option contract. If it is not practical for the institution to do so, it should take the amount by which the option contract is considered to be in-the-money as zero.

B.5.2 Delta-plus approach

72. A reporting institution which writes option contracts (other than a reporting institution using the simplified approach) should adopt the delta-plus approach and incorporate the delta-weighted positions of its outstanding option contracts into their respective risk categories, i.e. reported in Divisions A to D of the Form. Such delta-weighted option positions should be subject to:

    (a) the market risk capital charge for general market risk and specific risk for ***delta*** risk;

    (b) the market risk capital charge for ***gamma*** risk; and

(c)   the market risk capital charge for *vega* risk.

Delta risk

73.   A reporting institution should, for the purposes of calculating its delta risk, slot its delta-weighted positions which have debt securities or interest rates as the underlying exposures of the relevant option contracts into the time bands set out in **Table 2**.

74.   Interest rate option contracts should be regarded as long and short positions such that one position is referenced to the time the option contract concerned takes effect and the other position is referenced to the time that option contract matures. For example:

(a)   a purchased call option contract on a June three-month interest rate futures contract is to be reported in March, on the basis of its delta-weighted position, as a long position in a six-month zero-coupon specific risk-free security and a short position in a three-month zero-coupon specific risk-free security. A written option contract should similarly be reported as a long position in a three-month zero-coupon specific risk-free security and a short position in a six-month zero-coupon specific risk-free security;

(b)   a two-month purchased call option contract on a bond futures contract where delivery of the five-year bond takes place in September is to be reported in March as a long position in a 5 1/2 year bond and a short position in a six-month zero-coupon specific risk-free security, both positions being delta-weighted; and

(c)   floating rate instruments with caps or floors are to be reported as a combination of floating rate securities and a series of European-style option contracts. For example, the holder of a two-year floating rate bond indexed to six month LIBOR with a cap of 8% should be reported as:

(i)   a bond that reprices in six months; and

(ii)   a series of three written call option contracts on a forward rate agreement with a reference rate of 8%, each with a negative sign at the time the underlying agreement takes effect and a positive sign at the time the underlying agreement matures. The instructions applying to closely matched positions set out in paragraph 37 should also apply (see example (7) in **Annex IV-B**).

75.   A reporting institution should calculate the market risk capital charge for its option contracts with equities or equity indices as the underlying exposure by applying the calculation treatment set out in section B.2 to the delta-weighted positions of those option contracts. For this purpose, equities or equity indices on each exchange should be treated as a separate underlying exposure.

76.   A reporting institution should calculate the market risk capital charge for its option contracts with foreign exchange or gold as the underlying exposure by applying the

calculation treatment set out in section B.3 to the net delta-weighted positions (being the difference between the institution's total delta-weighted long positions and its total delta-weighted short positions) of those option contracts.

77. A reporting institution should calculate the market risk capital charge for its option contracts with commodities as the underlying exposure by applying the calculation treatment set out in section B.4 to the delta-weighted positions of those option contracts.

78. To sum up, the calculation treatment of the delta-weighted option positions should be the same as those for the positions in the underlying exposures of the option contracts as described in sections B.1 to B.4, except that the value of the underlying exposures should be adjusted by the delta of the relevant option contracts.

Gamma risk

79. Market risk capital charges for gamma risk should be reported in Division E.2 of the Form.

80. A reporting institution should calculate the gamma impact of each of its option contracts by using the following formula:

Gamma impact = $\frac{1}{2}$ x Gamma x VU^2

where VU = variation of the underlying exposure of the option contract

81. VU should be calculated as:

(a) for option contracts relating to debt securities, debt security indices and interest rates, the fair value of that underlying exposure multiplied by the risk-weight for the appropriate time band set out in **Table 2**;

(b) for option contracts relating to equities and equity indices, the fair value of that underlying exposure multiplied by 8%;

(c) for option contracts relating to foreign exchange (including gold), the fair value of that underlying exposure multiplied by 8%; and

(d) for option contracts relating to commodities, the fair value of that underlying exposure multiplied by 15%.

82. For the purposes of paragraph 81, a reporting institution should treat the following positions as the same underlying exposure:

(a) for interest rate exposures, positions within each time band as set out in **Table 2**;

(b) for equities and equity indices exposures, positions on each exchange;

(c)   for foreign exchange and gold exposures , positions in each currency pair and gold; and

(d)   for commodity exposures, positions in each commodity.

A reporting institution with option positions relating to more underlying exposures than the space provided in Division E.2 of the Form should report its positions in additional forms.

83.   Each option contract on the same underlying exposure should have a gamma impact that is either positive or negative. These individual gamma impacts should be offset to produce a positive or negative net gamma impact for that exposure. Only those negative net gamma impacts are reported in Division E.2 of the Form and included in the calculation of the reporting institution's market risk capital charge for gamma risk. The total market risk capital charge for gamma risk is the sum of the absolute value of the negative net gamma impacts.

Vega risk

84.   Market risk capital charges for vega risk should be reported in Division E.2 of the Form. A reporting institution should calculate the market risk capital charge for vega risk by multiplying the sum of the vegas for all of its option contracts on the same underlying exposure as defined in paragraph 82 by a proportional shift of 25% in the volatility of the value of the underlying exposures of those option contracts. For example, an increase of volatility in the value of the underlying exposure of an option contract carries a risk of loss for a short position in such option contract. Assuming the current volatility of the underlying exposure of the option contract at 20%, a proportional shift of 25% in the volatility means that the vega of the option contract has to be calculated on the basis of an increase in volatility of 5 percentage points from 20% to 25%. If the vega of an option contract is calculated as 1.68, i.e. a 1% increase in volatility increases the value of the option contract by 1.68, the change in volatility of 5 percentage points should increase the value of the option contract by 8.4 (1.68 x 5) which represents the market risk capital charge for vega risk to be reported in Division E.2 of the Form.

85.   The total market risk capital charge for vega risk is the sum of the absolute value of the individual market risk capital charges for vega risk.

Section C: IMM Approach to the Calculation of Market Risk

86.   A reporting institution which has been approved by the MA to use the IMM approach to calculate its market risk is required to report Division F of the Form.

87.   A reporting institution should calculate the risk-weighted amount for market risk as the sum of:

(a)   the market risk capital charge for general market risk calculated by the institution's *internal model*;

(b)   where applicable, the market risk capital charge for specific risk calculated by the institution's internal model; and

(c)   the capital surcharge for default risk,

multiplied by 12.5.

C.1   Market risk capital charge calculated by internal models

Market risk capital charge for general market risk

88.   If a reporting institution uses an internal model to calculate the market risk capital charge for general market risk, the institution should report the *VaR* amount calculated by the internal model as at the last *trading day* of the reporting quarter in column (a) of Division F.1 of the Form and the average VaR amount for the last 60 trading days of the reporting quarter in column (b) of Division F.1 of the Form, both for individual risk categories (i.e. items 1.1 to 1.4 of Division F.1 of the Form) and the aggregate of all risk categories (i.e. item 1.5 of Division F.1 of the Form).

89.   If the MA is satisfied that the reporting institution's system for identifying and measuring correlations is effective for its purpose and implemented in a prudent manner, recognition of empirical correlations across the risk categories (including related option volatilities in each risk category) is allowed. The VaR amount for the aggregate of all risk categories is not necessarily equal to an arithmetic sum of the VaR amounts for individual risk categories because of the correlations across the risk categories.

90.   The reporting institution should report in item 1.5(c) of Division F.1 of the Form the number of *back-testing exceptions* for the last 250 trading days of the reporting quarter (i.e. from the reporting quarter end going backwards) based on the actual daily changes in portfolio value. Similarly, the reporting institution should, where applicable, report in item 1.5(d) of Division F.1 of the Form the number of back-testing exceptions for the last 250 trading days of the reporting quarter based on the hypothetical changes in portfolio value that would occur if end-of-day positions remained unchanged during the one day holding period.

91. The multiplication factor to be reported in item 1.5(e) of Division F.1 of the Form is the sum of:

    (a) the value of 3;

    (b) a plus factor, ranging from zero to one, based on the number of back-testing exceptions (i.e. the larger of item 1.5(c) and item 1.5(d) of Division F.1 of the Form) for the last 250 trading days derived from **Table 5** or other considerations which satisfy the MA that the model in use is fundamentally sound and any increase in the back-testing exceptions is temporary; and

Table 5: Plus factors for back-testing exceptions

Zone	Number of back-testing exceptions out of 250 observations	Plus factor
Green zone	Less than 5	0.00
Yellow zone	5	0.40
	6	0.50
	7	0.65
	8	0.75
	9	0.85
Red zone	10 or more	1.00

    (c) any additional plus factor assigned to the institution by the MA. Where the MA is satisfied that the institution has ceased to satisfy any of the requirements specified in Schedule 3 of the Rules applicable to the institution, the MA may assign an additional plus factor to the institution.

92. A reporting institution should report the market risk capital charge for general market risk calculated by the internal model in item 1.7 of Division F.1 of the Form which is the higher of:

    (a) item 1.5(a), i.e. the institution's VaR amount for the aggregate of all risk categories as at the last trading day of the reporting quarter; and

    (b) item 1.6, i.e. the average VaR amount for the last 60 trading days of the reporting quarter (item 1.5(b)) times the multiplication factor (item 1.5(e)).

93. However, if a reporting institution uses a single internal model to calculate the market risk capital charge for both general market risk and specific risk, the institution does not need to report its calculation for general market risk and specific risk separately. In other words, the figures reported in items 1.1 to 1.7 of Division F.1 of the Form cover both general market risk and specific risk. The institution is not required to complete items 1.8 to 1.10 of Division F.1 of the Form.

Market risk capital charge for specific risk

94.   If a reporting institution uses one internal model to calculate the market risk capital charge for general market risk and another internal model to calculate the market risk capital charge for specific risk, the institution should report the figures relating to the market risk capital charge for specific risk in items 1.8 to 1.10 of Division F.1 of the Form according to the following instructions:

(a)   report in item 1.8(a) the VaR amount for the aggregate of all risk categories (i.e. interest rate exposures and equity exposures) as at the last trading day of the reporting quarter;

(b)   report in item 1.8(b) the average VaR amount for the last 60 trading days of the reporting quarter;

(c)   report in item 1.8(c) the number of back-testing exceptions for the last 250 trading days of the reporting quarter based on the actual daily changes in portfolio value;

(d)   report in item 1.8(d) the number of back-testing exceptions for the last 250 trading days of the reporting quarter based on the hypothetical changes in portfolio value that would occur if end-of-day positions remained unchanged during the one day holding period;

(e)   report in item 1.8(e) the multiplication factor which is calculated according to paragraph 91;

(f)   report in item 1.9 the average VaR amount for the last 60 trading days of the reporting quarter (item 1.8(b)) times the multiplication factor (item 1.8(e)); and

(g)   report in item 1.10 the market risk capital charge for specific risk which is the higher of item 1.8(a) and item 1.9.

95.   A reporting institution should report in item 1.11 of Division F.1 of the Form the capital surcharge for default risk of its trading book positions for interest rate exposures and equity exposures if the institution cannot capture, or adequately capture, such risk in its internal models. To avoid double counting, a reporting institution may, when calculating the default risk of its trading book positions, take into account the extent to which default risk has already been incorporated into the institution's internal model (in particular, for positions that would be closed out within 10 trading days in the event of adverse market conditions or other indications of deterioration in the credit environment).

96.   If a reporting institution captures the default risk through a capital surcharge, the capital surcharge does not need to be subject to a multiplication factor. The institution should, however, demonstrate to the satisfaction of the MA that the capital surcharge provides sufficient capital to cover that default risk in respect of the institution's positions.

97. If a reporting institution is not approved by the MA to use the IMM approach, it should report the market risk capital charge for specific risk for debt securities and debt-related derivative contracts in Division A of the Form and that for equities and equity-related derivative contracts in Division B of the Form.

Total market risk capital charge

98. A reporting institution should report in item 1.12 of Division F.1 of the Form the total market risk capital charge calculated by the internal models (including the capital surcharge for default risk of its trading book positions). Item 1.12 should be equal to the aggregate of items 1.7, 1.10 and 1.11 of Division F.1 of the Form.

C.2 Largest daily losses over the quarter

99. A reporting institution should report in Division F.2 of the Form in descending order (i) the five largest daily losses over the reporting quarter and (ii) their respective one-day VaR amounts for the exposures calculated by the internal models. If the number of daily losses during the reporting quarter is less than five, only all of such daily losses should be reported.

Section D: Risk-weighted Amount for Market Risk

100. The total market risk capital charges calculated under the STM approach for each risk category should be extracted from Divisions A to E of the Form and reported in item 1 of Division G of the Form.

101. The total risk-weighted amount for market risk of a reporting institution (i.e. item 3 of Division G of the Form) is equal to the sum of total market risk capital charge calculated under the STM approach (i.e. item 1 of Division G of the Form) and that calculated under the IMM approach (i.e. item 2 of Division G of the Form), multiplied by 12.5.

Hong Kong Monetary Authority
March 2010

Calculation of market risk capital charge for credit derivative contracts booked in reporting institutions' trading book

General

1.   The calculation of market risk capital charge for credit derivative contracts (e.g. *total return swap*, *credit default swap* and *credit-linked note*) booked in a reporting institution's trading book is set out in this Annex, which should be read in conjunction with the completion instructions of this Return and CR-G-12 "Credit Derivatives". An authorized institution should use the notional amount of the credit derivative contract to calculate the market risk capital charge for its credit derivative contracts except for paragraphs 20 and 21 of this Annex where the fair value of the credit-linked note should be used.   A reporting institution should consult with the MA on the appropriate treatment of any credit derivative contracts it has entered into if the structure of, or the arrangement of, such contracts is not covered in this Annex.

STM Approach to the calculation of market risk

Specific risk

2.   If a reporting institution has entered into a total return swap or a credit default swap as the protection seller, the institution should record a long position in the *reference obligation* specified in the swap contract.

3.   If a reporting institution has entered into a total return swap or a credit default swap as the protection buyer, the institution should record a short position in the reference obligation specified in the swap contract.

4.   If a reporting institution has purchased a credit-linked note (as the protection seller), the institution should record a long position in the reference obligation specified in the note and a long position in the note issuer.

5.   If a reporting institution has issued a credit-linked note (as the protection buyer), the institution should record a short position in the reference obligation specified in the note.

6.   If a reporting institution is the protection buyer of a *first-to-default credit derivative contract* or the issuer of a first-to-default credit-linked note and does not hold any long position in an underlying exposure which is identical to the reference obligation specified in the contract or note, as the case may be, the institution should record a short position in only one of the reference obligations in the basket of reference obligations specified in the contract or note, as the case may be (being the reference obligation which would yield the highest market risk capital charge for specific risk

among the various reference obligations in the basket of reference obligations specified in the contract or note, as the case may be).

7.   If a reporting institution is the protection buyer of a first-to-default credit derivative contract or the issuer of a first-to-default credit-linked note, the institution may offset the market risk capital charge for specific risk of the institution's long position in an underlying exposure which is identical to the reference obligation specified in the contract or note, as the case may be, against the market risk capital charge for specific risk of the institution's short position in that one of the reference obligations in the basket of reference obligations specified in the contract or note, as the case may be, which would yield the lowest market risk capital charge for specific risk for all of the reference obligations specified in the contract or note, as the case may be.

8.   If a reporting institution is the protection seller of a first-to-default credit derivative contract or the purchaser of a first-to-default credit-linked note, the institution should record long positions in each of the reference obligations in the basket of reference obligations specified in the contract or note, as the case may be, but in such circumstances the institution's total market risk capital charge for specific risk for the contract or note, as the case may be, should not exceed the institution's maximum liability under the contract or the fair value of the note, as the case may be. The institution is not required to comply with this additive treatment if it demonstrates to the satisfaction of the MA that there is a material positive correlation among the reference obligations in the basket of reference obligations specified in the contract or note, as the case may be, such that the value of each of the reference obligations in the basket would be likely to fall in the case of a fall in the value of any one of the reference obligations in the basket.

9.   If a reporting institution enters into a credit default swap, total return swap or credit-linked note which provides for payment to be made proportionately in respect of the reference obligations in the basket of reference obligations specified in the swap contract or note, as the case may be, the institution should record its positions in the reference obligations according to their respective proportions specified in the swap contract or note, as the case may be.

10.   If a reporting institution has purchased or issued a credit-linked note which is referenced to multiple reference obligations and satisfies the conditions for a qualifying debt security or debt-related derivative contract set out in section B.1.2 of the completion instructions, the institution may:

      (a)   if it has purchased the note, record the specific risk arising from its long positions in the multiple reference obligations specified in the note as a single long position in the note;

      (b)   if it has issued the note, record the specific risk arising from its short positions in the multiple reference obligations specified in the note as a single short position in the note.

11.   A reporting institution may use a credit derivative contract booked in the institution's trading book to offset the market risk capital charge for specific risk calculated for the

institution's trading book position in the underlying exposure which is identical to the reference obligation specified in the credit derivative contract, or in another credit derivative contract, in accordance with paragraph 12, 13 or 14 of this Annex. If paragraph 12, 13 or 14 of this Annex does not permit a reporting institution to use a credit derivative contract booked in the institution's trading book to offset the market risk capital charge for specific risk calculated for the institution's trading book position in the underlying exposure which is identical to the reference obligation specified in the credit derivative contract, or in another credit derivative contract, the institution should calculate and provide the market risk capital charge against both trading book positions.

12. A reporting institution may fully offset its position in a credit derivative contract against a position in the underlying exposure which is identical to the reference obligation specified in the credit derivative contract, or against a position in another credit derivative contract, for the purposes of calculating the market risk capital charge for specific risk if the values of the 2 positions, being the long or short position in the credit derivative contract, and the short or long position respectively in the underlying exposure which is identical to the reference obligation specified in the credit derivative contract or the short or long position respectively in the other credit derivative contract, always move in the opposite direction and broadly to the same extent due to:

  (a)   the 2 positions consisting of identical exposures; or

  (b)   a long or short position in the underlying exposure being hedged by a total return swap and there being a match between the reference obligation specified in the total return swap and the position in the underlying exposure in every aspect, and notwithstanding that the maturity of the total return swap may be different from that of the position in the underlying exposure.

If a reporting institution has fully offset its position in a credit derivative contract against a position in the underlying exposure which is identical to the reference obligation specified in the credit derivative contract, or against a position in another credit derivative contract, no market risk capital charge for specific risk is required to be calculated in respect of those positions.

13. A reporting institution may offset 80% of the market risk capital charge for specific risk of its position in a credit derivative contract against a position in the underlying exposure which is identical to the reference obligation specified in the contract where the values of the 2 positions, being the long or short position in the contract and the short or long position respectively in the underlying exposure which is identical to the reference obligation specified in the contract, always move in the opposite direction but not broadly to the same extent as set out in paragraph 12 of this Annex and the institution demonstrates to the satisfaction of the MA that the contract can mitigate the credit risk of the institution's position in the underlying exposure effectively. A reporting institution falls within this paragraph in any case where:

(a)   subject to paragraphs (b), (c) and (d), the institution's long or short position in the underlying exposure is effectively hedged by a credit default swap or a credit-linked note;

(b)   there is a match between:

(i)   the reference obligation specified in the credit default swap or credit-linked note referred to in paragraph (a) and the position in the underlying exposure;

(ii)   the maturity of the reference obligation specified in the credit default swap or credit-linked note referred to in paragraph (a) and of the position in the underlying exposure; and

(iii)   the currency in which the reference obligation specified in the credit default swap or credit-linked note referred to in paragraph (a) and the position in the underlying exposure are denominated;

(c)   the *credit event* definitions and settlement mechanisms and other key factors of the credit default swap or credit-linked note referred to in paragraph (a) do not cause the price movement of the swap contract or note, as the case may be, to materially deviate from the price movement of the position in the underlying exposure; and

(d)   the credit default swap or credit-linked note referred to in paragraph (a) transfers risk effectively taking account of any restrictive payout provisions (including fixed payouts and materiality thresholds).

If a reporting institution offsets its positions in a credit derivative contract pursuant to this paragraph, only 20% of the market risk capital charge for specific risk is required to be calculated for the position with the higher market risk capital charge for specific risk and the market risk capital charge for specific risk to be calculated for the other position should be zero.

14.   A reporting institution may offset partially the market risk capital charge for specific risk of its position in a credit derivative contract against a position in the underlying exposure which is identical to the reference obligation specified in the contract where the values of the 2 positions, being the long or short position in the contract and the short or long position respectively in the underlying exposure which is identical to the reference obligation specified in the contract, usually move in the opposite direction in any case where:

(a)   the position would fall within paragraph 12(b) of this Annex but for there being an asset mismatch between the reference obligation and the position in the underlying exposure (being that the reference obligation and the position in the underlying exposure are similar but not identical) and:

(i) the reference obligation specified in the contract ranks for payment or repayment equally with, or junior to, the position in the underlying exposure; and

(ii) the obligor in respect of the position in the underlying exposure is the same legal entity as the obligor in respect of the reference obligation and legally enforceable cross default or cross acceleration clauses are included in the terms of the position in the underlying exposure and the reference obligation;

(b) the position would fall within paragraph 12(a) or 13 of this Annex but for there being a currency or maturity mismatch between the contract and the position in the underlying exposure (*currency mismatch* should be included in the calculation of market risk capital charge for foreign exchange exposures according to section B.3 of the completion instructions); or

(c) the position would fall within paragraph 13 of this Annex but for there being a mismatch between the position in the underlying exposure and the reference obligation specified in the contract (being that the reference obligation and the position in the underlying exposure are similar but not identical) and the position in the underlying exposure is included in one of the deliverable obligations specified in the contract.

If a reporting institution offsets its positions in a credit derivative contract pursuant to this paragraph, the position with the higher market risk capital charge for specific risk should be subject to a partial allowance to reflect the extent of the offsetting but, in any case, not higher than 80% and the market risk capital charge for specific risk to be calculated for the other position should be zero.

General market risk

15. If a reporting institution has entered into a total return swap as the protection seller, the institution should:

(a) record a long position in the reference obligation specified in the swap contract;

(b) if there are periodic interest payments under the swap contract, record a short position in a specific risk-free security with fixed or floating rate interest according to the payment terms of the swap contract.

16. If a reporting institution has entered into a total return swap as the protection buyer, the institution should:

(a) record a short position in the reference obligation specified in the swap contract;

(b)   if there are periodic interest payments under the swap contract, record a long position in a specific risk-free security with fixed or floating rate interest according to the payment terms of the swap contract.

17.   If a reporting institution has entered into a credit default swap with no periodic premiums or interest payments under the swap contract, the institution is not required to calculate or provide the market risk capital charge for general market risk for the swap contract.

18.   If a reporting institution has entered into a credit default swap as the protection seller with periodic premiums or interest payments under the swap contract, the institution should record a long position in a specific risk-free security with fixed or floating rate interest according to the payment terms of the swap contract.

19.   If a reporting institution has entered into a credit default swap as the protection buyer with periodic premiums or interest payments under the swap contract, the institution should record a short position in a specific risk-free security with fixed or floating rate interest according to the payment terms of the swap contract.

20.   If a reporting institution has purchased a credit-linked note, the institution should record a long position in the note.

21.   If a reporting institution has issued a credit-linked note, the institution should record a short position in the note.

IMM Approach to the calculation of market risk

22.   A reporting institution should comply with section C of the completion instructions and the requirements specified in Schedule 3 of the Rules to apply the IMM approach to calculate the market risk capital charge for credit derivative contracts booked in its trading book.

23.   A reporting institution which does not use the IMM approach to calculate the market risk capital charge for credit derivative contracts booked in its trading book should use the STM approach to calculate those capital charges.

Counterparty credit risk

24.   If a reporting institution has entered into a total return swap as the protection buyer or the protection seller, the institution should calculate and provide the amount of capital required to cover the counterparty credit risk of its position in the swap contract.

25.   If a reporting institution has entered into a credit default swap as the protection buyer, the institution should calculate and provide the amount of capital required to cover the counterparty credit risk of its positions in the swap contract.

26.   If a reporting institution has entered into a credit default swap as the protection seller with no periodic premiums or interest payments under the swap contract, the

institution is not required to calculate or provide any amount of capital required to cover the counterparty credit risk of its position in the swap contract.

27.   If a reporting institution has entered into a credit default swap as the protection seller with periodic premiums or interest payments under the swap contract, the institution should calculate and provide the amount of capital required to cover the counterparty credit risk of its position in the swap contract.

28.   There is no counterparty credit risk for a reporting institution as the purchaser or issuer of a credit-linked note.

29.   Part III of the completion instructions of the Return of Capital Adequacy Ratio regarding counterparty credit risk should apply to credit derivative contracts booked in a reporting institution's trading book.

Foreign exchange risk

30.   If a reporting institution using the STM approach to calculate its market risk has entered into a credit derivative contract denominated in a currency other than HKD, the institution should apply the calculation treatment set out in section B.3 of the completion instructions to its foreign exchange position in the contract.

31.   If a reporting institution using the IMM approach to calculate its market risk has entered into a credit derivative contract denominated in a currency other than HKD, the institution should apply the calculation treatment set out in section C of the completion instructions to its foreign exchange position in the contract.

Illustrative examples

Suppose as at 31 December 200X, Example Bank Ltd. has:

1. a long position in US treasury bond (7.5% annual coupon) with face value equivalent to HKD78M and residual maturity of 8 years (fair value of the bond based on quoted price: HKD79,833K equivalent);

2. a long position in an unrated floating rate note (6.25% current annual coupon) issued by a US corporate with face value equivalent to HKD40M and next interest fixing date 9 months later (fair value of the note based on quoted price: HKD40,732K equivalent);

3. a long position in 10 futures contracts on 5-year US treasury note (face value USD100,000 per contract) for delivery 3 months later (selected deliverable: US treasury note (coupon 6.375%) maturing in 5.25 years, current price at 100.0625, conversion factor of 0.9423);

4. a single currency interest rate swap contract with face value HKD150M and residual maturity of 2.5 years (Example Bank Ltd receives annual floating rate interest and pays fixed rate interest at 8% per annum and the current floating rate is fixed at 5.5% with next interest fixing date 6 months later);

5. a long position in 50 futures contracts in 3-month HIBOR interest rate (face value HKD1M per contract) for delivery 6 months later;

6. a nine against fifteen FRA sold on 6-month HIBOR with notional amount HKD20M and settlement date 9 months later;

7. a GBP2M 2-year cap written on GBP 6-month LIBOR at cap rate 8%, next interest fixing date 6 months later and residual maturity 2 years (i.e. the cap is written on the reporting date);

8. a long position in forward foreign exchange contract of EUR5M against HKD25M equivalent maturing in 3 months;

9. a long position in 100,000 shares of a US listed company with current market price at HKD110 equivalent;

10. a long position in 50,000 shares of a HK listed company hedged by a long position in 25 put option contracts (each contract represents 1,000 shares) for the same equity (the current market price for the equity is HKD30 and the exercise price of all the option contracts is HKD33);

11. a short position in 1 Hang Seng Index futures contract for delivery 3 months later, current Hang Seng index at 10,000;

12. entered into a 5-year credit default swap as the protection seller (i.e. credit risk buyer) on HKD10M nominal of a non-qualifying Bond Y with a credit quality grade 4. The protection buyer pays it a fee of 100 basis points at the beginning and there are no periodic premiums or interest payments during the life of the swap. Under the terms of the contract, if a credit event occurs on Bond Y, it will pay the protection buyer HKD10M;

13. issued HKD1M nominal of a 3-year credit-linked note referenced to a non-qualifying Bond K with a credit quality grade 5. The note pays 8% interest annually. Under the terms of the contract, if no credit event occurs on Bond K, the note will mature at par in three years. If a credit event occurs on Bond K, the note will be redeemed for the credit event payment which is also set at HKD1M.

Positions to be reported in the Form:

1. Report the fair value of a long position in Division A.1, item 1.1 and Division A.2, USD ladder, >7 to 10 years time band.

2. Report the fair value of a long position in Division A.1, item 1.13 and Division A.2, USD ladder, >6 to 12 months time band.

3. Report a long position in the selected treasury note in Division A.1, item 1.1 and Division A.2, USD ladder, >5 to 7 years time band. Report the same amount for a short position in a zero-coupon specific risk-free security in Division A.2, USD ladder, >1 to 3 month time band.

   Assume spot exchange rate is 7.8,

   Amount to be reported: USD100,000 x 10 x 100.0625% / 0.9423 = USD1,061,896 = HKD8,283K equivalent

4. Report the fixed rate leg as a short position in a 2.5-year bond in Division A.2, HKD ladder, >2 to 3 years time band. Report the floating rate leg as a long position in a 6-month zero-coupon specific risk-free security in Division A.2, HKD ladder, >3 to 6 months time band.

   Assume the HKD zero-coupon yields are as follows:

Period	Zero-coupon yields
1M	5.31%
3M	5.63%
6M	5.81%
1Y	6.16%
2Y	6.69%
3Y	7.07%

   (Zero-coupon yields within one year can be taken as cash rates i.e. HIBOR; zero-coupon yields beyond one year can be constructed from, say, swap rates.)

Cash flows of the two legs of the HKD swap contract:

Pay: fixed rate interest
8% of HKD150M in 6 months
8% of HKD150M in 18 months
108% of HKD150M in 30 months

Receive: floating rate interest
105.5% of 150M in 6 months

Zero-coupon (ZC) rates at 18 months can be obtained from the linear interpolation between the one-year and two-year zero-coupon rates.

ZC(18 months) = (6.16% + 6.69%) / 2 = 6.425%

Similarly,

ZC(30 months) = (6.69% + 7.07%) / 2 = 6.88%

PV of the fixed leg (i.e. pay side)

$$
\begin{aligned}
&= \text{HKD150M} \times \left(\frac{0.08}{(1+0.0581\times0.5)} + \frac{0.08}{(1+0.06425)^{1.5}} + \frac{1.08}{(1+0.0688)^{2.5}} \right) \\
&= \text{HKD159,766K}
\end{aligned}
$$

PV of the floating leg (i.e. receive side)

$$
\begin{aligned}
&= \text{HKD150M} \times \frac{1.055}{(1+0.0581\times0.5)} \\
&= \text{HKD153,783K}
\end{aligned}
$$

5. Report a long position in a 9-month zero-coupon specific risk-free security in Division A.2, HKD ladder, >6 to 12 months time band and a short position in a 6-month zero-coupon specific risk-free security in Division A.2, HKD ladder, >3 to 6 months time band.

    Similar to the approach in example 4,
    ZC(9 months) = (5.81% + 6.16%) / 2 = 5.985%

    Amounts to be reported:

    Long position   =   HKD50M / (1+ 0.05985 x 0.75)
                    =   HKD50M x 0.957
                    =   HKD47,852K

    Short position =   HKD50M / (1+ 0.0581 x 0.5)
                    =   HKD50M x 0.9718
                    =   HKD48,589K

6. Report a long position in a 15-month zero-coupon specific risk-free security in Division A.2, HKD ladder, >1.0 to 1.9 years time band and a short position in a 9-month zero-coupon specific risk-free security in Division A.2, HKD ladder, >6 to 12 months time band.

    Similar to the approach in example 4,
    ZC(15 months) = 6.16% + (6.69% - 6.16%) x 0.25 = 6.2925%

    Long position   =   HKD20M / $(1 + 0.062925)^{1.25}$
                     =   HKD18,531K

    Short position   =   HKD20M / (1 + 0.05985 x 0.75)
                     =   HKD19,141K

7. Report the cap as 3 written call option contracts on 6-month FRA i.e. 6 against 12, 12 against 18 and 18 against 24.

    (The rate for the first 6 months is already set on the reporting date i.e. the option contract already expires.)

    Assume the delta of the option contracts are:

6	against 12	0.055
12	against 18	0.17
18	against 24	0.225

    Assume the discounting factors are:

6	month	0.9674
12	month	0.9346
18	month	0.9009
24	month	0.8673

    Assume spot exchange rate is 12,

    Report in Division A.2, GBP ladder:

    For the first option contract -

        a long position in the >6 to 12 months time band
            =   GBP2M x 0.055 x 0.9346
            =   HKD1,234K equivalent

        a short position in the >3 to 6 months time band
            =   GBP2M x 0.055 x 0.9674
            =   HKD1,277K equivalent

    For the second option contract -

a long position in the >1.0 to 1.9 years time band
   = GBP2M x 0.17 x 0.9009
   = HKD3,676K equivalent

a short position in the >6 to 12 months time band
   = GBP2M x 0.17 x 0.9346
   = HKD3,813K equivalent

For the third option contract -

a long position in the >1.9 to 2.8 years time band
   = GBP2M x 0.225 x 0.8673
   = HKD4,683K equivalent

a short position in the >1.0 to 1.9 years time band
   = GBP2M x 0.225 x 0.9009
   = HKD4,865K equivalent

(For simplicity, reporting required in Division E.2 of the Form is not presented in this example.)

8. Report a long position in a 3-month zero-coupon specific risk-free security in Division A.2, EUR ladder, >1 to 3 months time band and a short position in a 3-month zero-coupon specific risk-free security, HKD ladder, >1 to 3 months time band.

Assume 3-month EUR cash rate is 3.25% and spot exchange rate is 10,

Long position   = EUR5M / (1 + 0.0325 x 0.25)
                = HKD49,597K equivalent

Short position = HKD25M / (1 + 0.0563 x 0.25)
                = HKD24,653K

(For simplicity, reporting required in Division C of the Form is not presented in this example.)

9. Report a long position of HKD110 x 100,000 = HKD11M in Division B, item 1, US column.

10. Report a long position of HKD30 x 25,000 = HKD750K in Division B, item 1, HK column.

Report 25,000 shares covered by put option contract in Division E.1(a), item 1.3.

Amount to be reported:
   = (25,000 x HKD30 x 16%) - [25,000 x HKD(33 - 30)]
   = HKD45K

11. Report HKD50 x 10,000 = HKD500K in Division B, item 5, HK column and report the same amount in Division A.2, HKD ladder, >1 to 3 months time band.

12. Report a long position of HKD10M in Division A.1, item 1.11. No reporting is required in Division A.2.

13. Report a short position of HKD1M in Division A.1, item 1.12 and a short position in a 3-year note in Division A.2, HKD ladder, >2 to 3 years time band.

    Using the zero-coupon yields in example 4,

    Value of the note to be reported in Division A.2

$$= \text{HKD1M} \times \left(\frac{0.08}{(1+0.0616)} + \frac{0.08}{(1+0.0669)^2} + \frac{1.08}{(1+0.0707)^3} \right)$$
$$= \text{HKD1,026K}$$

**Numerical illustration of the composition of the market risk
capital charge for general market risk for interest rate exposures**

1.   Bank A has the following positions:

   (a)   a long position in a qualifying bond, $13.33 million fair value, residual maturity 8 years, coupon rate 8%;

   (b)   a long position in a sovereign bond, $75 million fair value, residual maturity 2 months, coupon rate 7%;

   (c)   for an interest rate swap contract, $150 million[1], Bank A receives floating rate interest and pays fixed rate interest, next interest fixing date 9 months later, residual life of swap contract 8 years; and

   (d)   a long position in an interest rate futures contract, $50 million, delivery date 6 months later, life of the underlying exposure 3.5 years.

2.   The table below shows how these positions are slotted into the time bands and are weighted according to the risk-weights given in **Table 2** of section B.2.   After weighting the positions, the next steps in the calculation will be:

($ million)	Zone 1				Zone 2			Zone 3					
Time band	0-1	>1-3	>3-6	>6-12	>1-2	>2-3	>3-4	>4-5	>5-7	>7-10	>10-15	>15-20	>20
(coupon of not less than 3%)	Months				Years								
Position		+75 Sov.	-50 Fut.	+150 Swap			+50 Fut.			-150 Swap +13.33 Qual.			
Risk-weight (%)	0.00	0.20	0.40	0.70	1.25	1.75	2.25	2.75	3.25	3.75	4.50	5.25	6.00
Position x Weight		+0.15	-0.20	+1.05			+1.125			-5.625 +0.5			
Vertical Disallow.										0.5 x 10% = 0.05			
Horizontal Disallow. 1	0.20 x 40 % = 0.08												
Horizontal Disallow. 2					1.125 x 40% = 0.45								
Horizontal Disallow. 3	1.0 x 100% = 1.0												

   (a)   The *vertical disallowance* in time band >7-10 years has to be calculated: The matched position in this time band is $0.5 million (being the lesser of the absolute values of the total risk-weighted long and short positions) which leads

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[1] The positions should be recorded based on the fair value of the underlying exposure. Depending on the current interest rate, the fair value of each leg of the swap contract (i.e., the 8-year bond and the 9-month floater) can be either higher or lower than the notional amount. For the sake of simplicity, the illustration assumes that the current interest rate is identical with the one the swap contract is based on.

to a market risk capital charge of $0.05 million (i.e. 10% of $0.5 million) or $50,000. The remaining net risk-weighted (short) position is -5.125.

(b)   The *horizontal disallowance for individual zones* has to be calculated: As there is more than one position in zone 1 only, a horizontal disallowance can be calculated in this zone. In doing this, the matched position is calculated as $0.2 million (being the lesser of the absolute values of the total net risk-weighted long and short positions for the zone). The market risk capital charge for the horizontal disallowance in zone 1 is $0.08 million (i.e. 40% of $0.2 million) or $80,000. The remaining net risk-weighted (long) position in zone 1 is +$1.00 million.

(c)   The *horizontal disallowances between adjacent zones*[2] have to be calculated: After calculating the net risk-weighted position in zone 1, the following risk-weighted positions remain: zone 1 +$1.00 million, zone 2 +$1.125 million, zone 3 -$5.125 million. The matched position between zone 2 and zone 3 is $1.125 million (being one zone having a total net risk-weighted long position while another zone has a total net risk-weighted short position). The market risk capital charge in this case is $0.45 million (i.e. 40% of $1.125 million) or $450,000.

(d)   The *horizontal disallowance between zone 1 and zone 3* has to be calculated: The net risk-weighted (long) position in zone 1 is +$1.00 million, and the net risk-weighted (short) position in zone 3 is -$4.00 million, resulting in a remaining net risk-weighted position of $3.00 million (regardless of sign). The horizontal disallowance between the zone 1 and zone 3 is 100% of the matched position which leads to a market risk capital charge of $1.00 million (i.e. 100% of $1.00 million) or $1,000,000.

(e)   The remaining net risk-weighted position is $3.00 million leading to a market risk capital charge of $3,000,000.

3.   The total market risk capital charge for general market risk in this illustration is:

- for the vertical disallowance $50,000
- for the horizontal disallowance in zone 1 $80,000
- for the horizontal disallowance between adjacent zones $450,000
- for the horizontal disallowance between zone 1 and zone 3 $1,000,000
- for the remaining net risk-weighted position $3,000,000
  $4,580,000

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[2] No horizontal disallowance between zone 1 and zone 2 needs to be calculated as their positions are of the same sign.