

Completion Instructions

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

Introduction

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 *credit risk* for its relevant market risk positions and complete Form MA(BS)3(IIIa), MA(BS)3(IIIb) or MA(BS)3(IIIc) 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.
3. This Form and its completion instructions should be read in conjunction with the Banking (Capital) Rules and the relevant supervisory guidelines relating to the market risk capital framework. The reporting institution should refer to section 2 and Part 8 of the Rules for the definition of the terms in bold and italics used in this Form and its completion instructions.

Section A: Definitions and Clarification

4. 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 8). Any reporting institution which has been approved by the MA to use the IMM approach to calculate its market risk –

- (a) is nevertheless required to adopt the STM approach to calculate the market risk capital charge for specific risk in accordance with paragraph 113 of the instructions; and
 - (b) cannot revert to the STM approach, except with the MA's *prior consent*.
- 5. Subject to paragraph 6, 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*.
- 6. 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.
- 7. A reporting institution should comply with section 4A of the Rules when valuing its trading book positions, whether based on a *marking-to-market* or *marking-to-model* methodology. Among other things, this means the institution must value its positions in a prudent and reliable manner and consider making *valuation adjustment* to its positions as appropriate (including by taking into account the limitation of the valuation model or methodology and the data used by the institution in the valuation process, the liquidity of the positions and other relevant factors that might reasonably be expected to affect the prudence and reliability of the valuation of the positions).
- 8. A reporting institution should complete various divisions of this Form according to the following instructions:
 - (a) a reporting institution using the STM approach should complete Divisions A to E and Division G of the Form;
 - (b) a reporting institution using the IMM approach should complete (i) (where applicable) Division A1(b), (c) and (d); and (ii) Divisions F and G, of the Form;
 - (c) a reporting institution using a combination of the IMM approach and STM approach should complete Divisions A to G of the Form; and

- (d) a reporting institution using the approach adopted by its parent bank should separately agree with the MA the reporting contents and basis.
9. 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**.
 10. 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

11. The completion instructions in this section apply to reporting institutions adopting the STM approach to calculate the market risk capital charge for general market risk, specific risk, or both, in respect of all or individual exposure types covered in this section. Such institutions include those approved by the MA to use the IMM approach to calculate market risk for their specific risk interest rate exposures but are required under the Rules to use the STM approach in respect of specified trading book positions as set out in sections B.1.1.2 and B.1.1.4 and, where applicable, B.1.1.3.
12. 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)

13. 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.
14. 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 for each of its trading book positions (whether long or short) in debt securities and debt-related derivative contracts-
 - (i) in accordance with section 287 of the Rules if these positions arise from *non-securitization exposures* which do not fall within subparagraph (iii) or (iv) of section 286(a) of the Rules;
 - (ii) in accordance with section 287A of the Rules if these positions arise from *securitization exposures*¹ which do not fall within subparagraph (iii) of section 286(a) of the Rules;
 - (iii) in accordance with section 287B of the Rules if these positions fall within a *correlation trading portfolio*; and
 - (iv) in accordance with sections 287 and Division 10 of the Rules if these positions arise from credit derivative contracts which do not fall within subparagraph (ii) or (iii) of section 286(a) of the Rules;

¹ Securitization exposures include re-securitization exposures unless stated otherwise.

- (b) subject to paragraph (c), calculate in accordance with section 288 of the Rules the market risk capital charge for general market risk for:
 - (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; and
 - (c) calculate in accordance with section 288 and Division 10 of the Rules the market risk capital charge for general market risk for the interest rate exposures arising from its trading book positions (whether long or short) in credit derivative contracts.
15. A reporting institution should follow section 76, 123 or 202 of the Rules, as the case requires, for the calculation of the **risk-weighted amount** of **repo-style transactions** booked in the trading book.

B.1.1 Interest rate exposures – specific risk

16. For the purposes of section B.1.1, a reference to AIs adopting the STM approach refers to reporting institutions that do not have the MA's approval to use the IMM approach to calculate the market risk capital charge for specific risk for interest rate exposures; whereas a reference to AIs adopting the IMM approach refers to reporting institutions that have the MA's approval to use the IMM approach to calculate the market risk capital charge for specific risk for interest rate exposures but are nevertheless required to adopt the STM approach to calculate the market risk capital charge for specific risk for certain types of market risk exposures in accordance with paragraph 113 of the completion instructions.

B.1.1.1 Division A.1(a) of Form MA(BS)3(IV) – Non-securitization exposures that do not fall within a correlation trading portfolio and that are not n^{th} -to-default credit derivative contracts (Applicable to AIs adopting the STM approach)

17. A reporting institution is required to report in Division A.1(a) of the Form the market risk capital charge for specific risk for its trading book positions in **specific risk interest rate exposures** that satisfy all of the following criteria: (a) they are non-securitization exposures; (b) they do not fall within a correlation trading portfolio; and (c) they are not **n^{th} -to-default credit derivative contracts**. Such positions are referred to as “relevant” specific risk interest rate exposures for the purposes of Division A.1(a).
18. A reporting institution should assign each of its trading book positions (whether long or short) in relevant specific risk interest rate exposures into items 1.1 to 1.13 of

Division A.1(a) 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**; and report the respective grand totals for long and for short positions in item 1.14. The institution should follow the instructions set out in **Annex IV-A** for calculation and reporting of market risk capital charge for credit derivative contracts.

19. The reporting institution should then multiply the total positions (i.e. long plus short positions) for each column reported in item 1.14 by the appropriate **market risk capital charge factors** for specific risk specified in item 1.15 of Division A.1(a) of the Form. The total market risk capital charge for specific risk of each column reported in item 1.16 (except the last column) is equal to the product of item 1.14 and item 1.15 under the same column, adjusted for the effect of the maximum possible loss provision for credit derivative contracts that the institution may adopt in accordance with paragraph 20. The grand total of market risk capital charge for specific risk reported in the last column of item 1.16 is equal to the sum of the market risk capital charge for specific risk of each of the other columns.

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%

20. The market risk capital charge for specific risk for a reporting institution's positions in a credit derivative contract (other than an nth-to-default credit derivative contract) may be capped at the maximum possible loss arising from the contract, which should be calculated for each individual position as:
 - (a) where the institution is a protection buyer, the change in the value of the contract in the event that all the *reference obligations* specified in the contract were to become immediately default risk-free;
 - (b) where the institution is a protection seller, the change in the value of the contract in the event that all the reference obligations specified in the contract were to default immediately with zero recoveries.
21. A reporting institution should not offset between positions in the relevant specific risk interest rate exposures except for:
 - (a) long and short positions in identical issues (including positions in *derivative contracts*); and
 - (b) credit derivative contracts set out in paragraphs 11 to 13 of **Annex IV-A**.
22. For the purposes of paragraph 19, 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 23 to 26, 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.
23. Subject to paragraph 26, 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*.
24. Subject to paragraph 26, the credit quality grade of debt securities issued by a *public sector entity* or, in the case of debt-related derivative contracts where the underlying debt securities are issued by a public sector entity, is determined by reference to the ECAI issuer rating of the sovereign of the jurisdiction in which the public sector entity concerned is incorporated.
25. Subject to paragraph 26, in the case of other 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.

26. 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 23, which does not have an ECAI issuer rating;
 - (b) any debt securities or, in the case of debt-related derivative contracts, any underlying debt securities, referred to in paragraph 24, which do not have an ECAI issue specific rating; or the sovereign of the jurisdiction in which the public sector entity concerned is incorporated does not have an ECAI issuer rating; and
 - (c) any debt securities or, in the case of debt-related derivative contracts, any underlying debt securities, referred to in paragraph 25, which do not have an ECAI issue specific rating.
27. A reporting institution may only 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 23; 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 23,
- 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.
28. A reporting institution may only include in the qualifying class under items 1.6 to 1.10 of Division A.1(a) 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 issued by public sector entities and debt-related derivative contracts where the underlying debt securities are issued by public sector entities if:
 - (i) subject to paragraph 26(b), the debt securities or the underlying securities, as the case may be, are assigned a credit quality grade of 2 or 3 as determined under sub-paragraph (ii) below;

- (ii) the credit quality grade referred to in sub-paragraph (i) above is determined as one grade below that assigned to the sovereign (which is determined in accordance with paragraphs 23 and 26(a)) of the jurisdiction in which that public sector entity is incorporated² or, if there is no such lower credit quality grade, the credit quality grade applicable to that sovereign³;
 - (c) debt securities, not falling within paragraph (a) or (b), which are rated **investment grade** and debt-related derivative contracts where the underlying debt securities, not falling within paragraph (a) or (b), which are rated investment grade; and
 - (d) 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.
29. A reporting institution should include in the non-qualifying class under items 1.11 to 1.13 of Division A.1(a) 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 28.
30. If debt securities issued by public sector entities or debt-related derivative contracts where the underlying debt securities are issued by public sector entities are assigned a credit quality grade of 6 under paragraph 28(b)(ii), such securities or contracts, as the case may be, should be subject to the same market risk capital charge factor as that assigned to the "non-qualifying" positions that are assigned a credit quality grade of 5 (i.e. 12.00%) as set out in column 3 of the second last row of **Table 1**.

² This means if the sovereign has a credit quality grade of 1, a public sector entity under that sovereign will be assigned a credit quality grade of 2 and so on.

³ This means if the sovereign has a credit quality grade of 6 (the lowest grade), a public sector entity under that sovereign will also be assigned a credit quality grade of 6.

31. 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.

32. 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(a) of the Form.

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

B.1.1.2 Division A.1(b) of Form MA(BS)3(IV) - Securitization exposures that do not fall within a correlation trading portfolio (*Applicable to AIs adopting the STM or IMM approach*)

34. A reporting institution is required to report in Division A.1(b) of the Form the market risk capital charge for specific risk for its trading book positions (whether long or short) in securitization exposures that do not fall within a correlation trading portfolio. Such positions are referred to as "relevant" specific risk interest rate exposures for the purposes of Division A.1(b).
35. The treatment for securitization exposures held in the trading book aligns with that for securitization exposures held in the banking book, subject to necessary modifications. Reporting institutions should therefore apply the completion instructions of Form

MA(BS)3(IIIId) in completing Division A.1(b) of this Form except as specified in paragraphs 36 to 41 below. In case of doubt, please consult the institutions' usual supervisory contact.

36. A reporting institution should apply the completion instructions of Form MA(BS)3(IIIId) in relation to Division A.1(b) of Form MA(BS)3(IV) as if –
- (a) a reference in the completion instructions of Form MA(BS)3(IIIId) to Table 1, 2, 3 or 4 were a reference to Table 28A, 28B, 28C or 28D in **Annex IV-D** respectively;
 - (b) a reference in the completion instructions of Form MA(BS)3(IIIId) to Annex IIIId-C or Table A, B, C or D therein were a reference to **Annex IV-D** or Table 28E, 28F, 28G or 28H therein respectively; and
 - (c) a reference in the completion instructions of Form MA(BS)3(IIIId) to risk-weight were a reference to market risk capital charge factor.
37. As an overview, a reporting institution should report in Division A.1(b) of the Form its trading book positions (whether long or short) in the relevant specific risk interest rate exposures as follows:
- (a) Positions in *rated* securitization exposures and in other securitization exposures (e.g. *investors' interest*) that are not subject to capital deduction are reported in Section A1 (if the securitization exposures concerned are subject to the **STC(S) approach**) or A2 (if the securitization exposures concerned are subject to the **IRB(S) approach**), based on the nature of the securitization exposures, credit quality grades, and whether the institution has incurred the positions in those exposures as an investing institution or originating institution;
 - (b) For positions in unrated securitization exposures (which, for the purposes of section B.1.1.2, refer to securitization exposures that are not rated or treated as if not rated for regulatory capital purposes) that are not subject to capital deduction, report them in item 1.3 in section A if they are subject to the STC(S) approach; or in item 2.6 in section A if they are subject to the IRB(S) approach and to which the **supervisory formula method** or the method specified in section 277(3) of the Rules apply;
 - (c) Positions in securitization exposures (whether rated or unrated) that are subject to capital deduction should be reported in Section B; and
 - (d) The institution should not offset between trading book positions in securitization exposures except as provided for in section 287(2)(a) of the Rules. The credit risk mitigation rules in the banking book do not apply in the trading book. AIs must not therefore apply the credit risk mitigation framework under the banking book securitization framework to determine their securitization positions subject to market risk capital charges. (While the trading book regime allows the offsetting of long and short positions in

identical issues, the banking book regime subjects long positions in securitization exposures held in AIs' banking books to credit risk capital charges and any permissible relief from identical short positions can only come from the application of strict credit risk mitigation provisions.)

38. Subject to paragraphs 39 and 40 below, for the purposes of calculating the market risk capital charge for specific risk for its trading book positions (whether long or short) in the relevant specific risk interest rate exposures, a reporting institution should -
- (a) first calculate a preliminary market risk capital charge for specific risk for each of the individual positions reported in Section A -
 - (i) for a position in rated securitization exposures reported in column (3), (4), (5) or (6) of item 1.1, 1.2, 2.1, 2.2, 2.3, 2.4 or 2.5 of Section A, by multiplying the position by the applicable market risk capital charge factor set out in the relevant table in **Annex IV-D** and recapped in column (7) or (8) in Section A; and
 - (ii) for a position in securitization exposures reported in column (3), (4), (5) or (6) of item 1.3 or 2.6 of Section A, by multiplying the position by the applicable market risk capital charge factor as determined by applying the relevant completion instructions of Form MA(BS)3(IIIId), bearing in mind that the market risk capital charge factor is equal to the corresponding risk-weight in that Form divided by 12.5;
 - (b) calculate an adjusted market risk capital charge for specific risk for the individual positions reported in Section A, by capping the respective preliminary market risk capital charge for specific risk for these positions at their respective maximum possible loss amount, which is calculated for each individual position as follows:
 - (i) for a short position, the maximum possible loss is calculated as the change in the value of the position in the event that all the underlying exposures were to become immediately default risk-free;
 - (ii) for a long position, the maximum possible loss is calculated as the change in the value of the position in the event that all the underlying exposures were to default immediately with zero recoveries;
 - (c) report in columns (9) and (10) of items 1.1 to 2.7 of Section A respectively the adjusted market risk capital charge for specific risk for the institution's long and short trading book positions in the relevant specific risk interest rate exposures;
 - (d) ensure that item 1.4 of each column in Section A is equal to the sum of items 1.1(f), 1.2(f) and 1.3;
 - (e) ensure that the "Total" row of item 2.7 under Section A is equal to the sum of the sub-totals under row (m) of items 2.1 to 2.5 and item 2.6, with a further

breakdown of positions and related market risk capital charge for specific risk for the positions in terms of (i) rated and unrated securitization (excluding re-securitization) exposures; and (ii) rated and unrated re-securitization exposures. Investors' interest, if any, should be included in item 2.7(a)(ii) or (b)(ii);

- (f) for columns (9) and (10) of item 2.8 of Section A, ensure that the market risk capital charge reported is equal to the corresponding total amount of adjusted market risk capital charge reported in item 2.7 multiplied by the scaling factor of 1.06, which is applicable only to securitization exposures subject to the IRB(S) approach;
- (g) for item 3 of Section A, ensure that the position columns (3) to (6) is equal to the sum of the total of items 1.4 and 2.7 of Section A; whereas the market risk capital charge columns (9) and (10) is equal to the sum of items 1.4 and 2.8 of Section A; and
- (h) report in column (11) of item 3 of Section A the applicable market risk capital charge for the relevant specific risk interest rate exposures as -
 - (i) during the **transitional period (securitization)** (i.e. 1 January 2012 to 31 December 2013, both dates inclusive), the *larger* of the total adjusted market risk capital charge for specific risk for the long positions in item 3(9) or the total adjusted market risk capital charge for specific risk for the short positions in item 3(10);
 - (ii) after the transitional period (securitization), the *sum* of the adjusted market risk capital charge for specific risk for each of the positions (i.e. item 3(9) + item 3(10)).

The completion instructions set out in this paragraph are on the basis that the treatment under paragraph 20 is adopted by the institution. If the institution does not adopt the treatment under paragraph 20, the adjusted market risk capital charges for specific risk referred to in this paragraph will then be equal to the respective preliminary market risk capital charges for specific risk.

39. A reporting institution should, for the purposes of calculating the market risk capital charge for specific risk in respect of its unrated positions in securitization exposures subject to the IRB(S) approach, and subject to paragraph 40 and with the MA's prior consent, use one of the following methods and apply it consistently-
- (a) where the institution has obtained the MA's approval to use the IRB approach to calculate the credit risk capital charge for the **IRB class** or **IRB subclass** into which the **underlying exposures** of the positions are classified, the supervisory formula method as prescribed in Division 6 of Part 7 of the Rules; or
 - (b) where the institution has obtained the MA's approval to use the IMM approach to calculate the **incremental risk charge** for the underlying exposures of such positions, the supervisory formula method as referred to in paragraph (a), but applying the estimates for PD and **LGD** produced by the internal model that the

institution uses to calculate the incremental risk charge for calculating K_{IRB} ⁴ under the supervisory formula method.

40. In respect of a position referred to in paragraph 39, the institution should calculate in accordance with that paragraph the market risk capital charge for specific risk, subject to the floor that such market risk capital charge should not be lower than the market risk capital charge for specific risk applicable to a position in a rated and more senior tranche.
41. A reporting institution should report all its trading book positions (whether long or short) in securitization exposures that are subject to deduction from its **core capital** and/or **supplementary capital** in Section B of Division A.1(b) of the Form by applying the completion instructions of Form Part III(d). The figures reported in Column (c) of items 4(a) and 4(b) should also be reported respectively in item (g)(iv) of Part II(a) and item (9)(iii) of Part II(b) of Form MA(BS)3(II).

B.1.1.3 Division A.1(c) of Form MA(BS)3(IV) - Correlation trading portfolio
(Applicable to AIs adopting the STM approach or (where applicable) the IMM approach)

42. A reporting institution that uses-
 - (a) the STM approach to calculate its market risk in respect of specific risk for its exposures in a correlation trading portfolio; or
 - (b) the IMM approach to calculate its market risk in respect of specific risk for its interest rate exposures but do not have the MA's approval to calculate the comprehensive risk charge for its exposures in a correlation trading portfolio under the IMM approach,is required to report in Division A.1(c) of the Form the market risk capital charge for specific risk for its trading book positions (whether long or short) in a correlation trading portfolio. The qualifying criteria for including an institution's trading book positions in a correlation trading portfolio are set out in the definition of the same in section 281 of the Rules.
43. For the reporting of positions in a correlation trading portfolio and the associated market risk capital charge for specific risk in Division A.1(c) of the Form, a reporting institution should -
 - (a) apply section 287A of the Rules in respect of positions (whether long or short) in securitization exposures that fall within paragraph (a) of the definition of correlation trading portfolio in section 281 of the Rules, and adhere to section B.1.1.2 of the completion instructions (as a reminder, the market risk capital charge for specific risk for positions in securitization exposures that are subject to the IRB(S) approach attract a scaling factor of 1.06 – see paragraph 38(f));

⁴ Please see section 271(a) of the Rules for the meaning of K_{IRB} .

- (b) apply section 287 and Division 10 of the Rules in respect of positions (whether long or short) in nth-to-default credit derivative contracts that fall within paragraph (a) of the definition of correlation trading portfolio in section 281 of the Rules, and adhere to section B.1.1.4 of the completion instructions; and
 - (c) apply section 287 of the Rules in respect of positions (whether long or short) that fall within paragraph (b) of the definition of correlation trading portfolio in section 281 of the Rules, and adhere to section B.1.1.1 of the completion instructions.
44. A reporting institution should report its total long positions and total short positions in its correlation trading portfolio in columns (1) and (2) respectively, and the associated aggregate market risk capital charge for specific risk for those long positions and that of those short positions in columns (3) and (4) respectively, of Division A.1(c) of the Form.
45. A reporting institution should not offset positions or the market risk capital charge for specific risk for its positions in a correlation trading portfolio except as specified in the applicable completion instructions set out in section B.1.1.1, B.1.1.2 or B.1.1.4, as the case may be.
46. The higher of the total market risk capital charge for specific risk that applies to the long positions or the total market risk capital charge for specific risk that applies to the short positions, as calculated in accordance with paragraphs 43 to 45 above, should be reported in column (5) of Division A.1(c) of the Form.
47. Below is an illustrative example for applying paragraphs 43 to 46 in respect of a correlation trading portfolio -
- (a) An AI is assumed to hold various positions in a correlation trading portfolio as shown in column 1 of **Table 1A**, and it is further assumed that none of these positions is eligible to be offset for the purposes of calculation of market risk capital charge for specific risk; and
 - (b) The applicable provisions in section 287B for calculating the associated market risk capital charge for specific risk for the positions in the correlation trading portfolio and the assumed resultant capital charges are shown in column 2 (for long positions) or column 3 (for short positions) of the table, while the market risk capital charge for specific risk for the correlation trading portfolio is stated in the last row of the table.

Table 1A: Illustrative example on calculation of market risk capital charge for specific risk for positions in a correlation trading portfolio (“CTP”)

Positions in the CTP	Market risk capital charge for specific risk - long positions	Market risk capital charge for specific risk - short positions
1. Positions in securitization exposures (apply paragraph (a) of the definition of CTP)	\$20 (apply section 287B(1)(a) of the Rules)	\$10 (apply section 287B(1)(a) of the Rules)
2. Positions in n th -to-default credit derivative contracts (apply paragraph (a) of the definition of CTP)	\$40 (apply section 287B(1)(b) of the Rules)	\$30 (apply section 287B(1)(b) of the Rules)
3. Positions for hedging the positions in items 1 and 2 (apply paragraph (b) of the definition of CTP)	\$30 (apply section 287B(1)(c) of the Rules)	\$20 (apply section 287B(1)(c) of the Rules)
Total for the positions above	\$90	\$60
Market risk capital charge for specific risk for the CTP	\$90 (apply section 287B(2) of the Rules)	

B.1.1.4 Division A.1(d) of Form MA(BS)3(IV) – Non-securitization exposures that are nth-to-default credit derivative contracts (excluding those that fall within a correlation trading portfolio) (Applicable to AIs adopting the STM or IMM approach)

48. A reporting institution is required to report in Division A.1(d) of the Form the market risk capital charge for specific risk for its trading book positions (whether long or short) in non-securitization exposures that are nth-to-default credit derivative contracts (excluding those that fall within a correlation trading portfolio). Such positions are referred to as “relevant” specific risk interest rate exposures for the purposes of Division A.1(d).
49. Subject to paragraphs 50 and 51, a reporting institution should follow the completion instructions under section B.1.1.1 for reporting items 1.1 to 1.16 of Division A.1(d) of the Form, except that item 1.16 in this Division is broken down into one row for long positions and one row for short positions.

50. The reporting institution should report in item 1.17 the applicable total market risk capital charge for specific risk for its long and short positions in its relevant specific risk interest rate exposures as:
- (a) during the transitional period (securitization), the *larger* of the total market risk capital charge for specific risk (having applied the maximum possible loss provision in paragraph 20 to individual relevant positions if this treatment is adopted) for the long positions reported in the last column of item 1.16 or the total market risk capital charge for specific risk (having applied the maximum possible loss provision in paragraph 20 to individual relevant positions if this treatment is adopted) for the short positions reported in the last column of item 1.16;
 - (b) after the transitional period (securitization), the *sum* of the total market risk capital charge for specific risk (having applied the maximum possible loss provision in paragraph 20 to individual relevant positions if this treatment is adopted) for each of the positions reported in the last column of item 1.16.
51. For each relevant position in an n^{th} -to-default credit derivative contract or an n^{th} -to-default ***credit-linked note***, irrespective of whether the institution is a protection buyer or a protection seller:
- (a) the market risk capital charge for specific risk for a ***first-to-default credit derivative contract*** or a first-to-default credit-linked note is the lesser of-
 - (i) the sum of the market risk capital charge for specific risk for the individual reference obligations in the basket of reference obligations specified in the contract or note, as the case may be; or
 - (ii) the institution's maximum liability under the contract or the fair value of the note, as the case may be; and
 - (b) the market risk capital charge for specific risk for an n^{th} -to-default credit derivative contract or an n^{th} -to-default credit-linked note, where n is greater than 1, is the lesser of:
 - (i) the sum of the market risk capital charge for specific risk for the individual reference obligations in the basket of reference obligations specified in the contract or note, as the case may be, but disregarding the $(n-1)$ obligation or obligations with the lowest market risk capital charge for specific risk; or
 - (ii) the institution's maximum liability under the contract or the fair value of the note, as the case may be.

B.1.2 Interest rate exposures - general market risk

Construction of maturity ladder

52. 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.
53. 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 **Table 2**; and
 - (b) with a coupon of less than 3% per annum into a maturity ladder comprising the 15 time bands set out in **Table 2**.

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%

54. For the purposes of paragraph 53, 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.
55. 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 56 to 59 and slot such positions into the time bands set out in **Table 2**.

56. 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.
57. **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.
58. 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**).

59. 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.

60. 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. 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.
61. 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 as determined in accordance with section 4A of the Rules as if measured at fair value. 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**).

62. 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

63. 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 64:
 - (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%		

64. For the purposes of:

- (a) a reporting institution conducting the first round of horizontal offsetting under paragraph 63(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 63(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.

65. 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 63(c);
- (b) the total market risk capital charge for horizontal disallowance for individual zones and across different zones calculated in accordance with paragraph 63(d); and
- (c) the market risk capital charge for the remaining net risk-weighted long or short position calculated in accordance with paragraph 63(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.

66. 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

67. 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.
68. A reporting institution should use the **maturity method** set out in paragraphs 52 to 66 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)

69. 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.
70. 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 for each of those positions; and
 - (b) calculate the market risk capital charge for general market risk for those positions.
71. For the purpose of paragraph 70, 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.

72. 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**).
73. 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.
74. 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.
75. 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.

76. A reporting institution should calculate the market risk capital charge for specific risk for 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 for 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

77. 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.
78. 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 6(b), 79 and 80, 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.
79. Where a reporting institution has reported positions in "structural assets (liabilities)" in column 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 78 above.
80. 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.

81. 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.
82. 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.
83. 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”.
84. 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).
85. 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

86. 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.
87. 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.
88. 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.

89. 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.
90. 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.
91. 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

92. 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

93. 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.

94. 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.

95. 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: $\$1,000 \times 16\%$ (8% specific risk plus 8% general market risk) = \$160, less the amount by which the option contract is in-the-money $(\$11 - \$10) \times 100 = \$100$, 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%

96. 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.
97. 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

98. 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

99. 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**.

100. 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 62 should also apply (see example (7) in **Annex IV-B**).
101. 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.
102. 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.
103. 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.
104. 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

105. Market risk capital charges for gamma risk should be reported in Division E.2 of the Form.
106. A reporting institution should calculate the gamma impact of each of its option contracts by using the following formula:

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

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

107. 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%.
108. For the purposes of paragraph 107, 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.

109. 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

110. 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 107 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 (1.68×5) which represents the market risk capital charge for vega risk to be reported in Division E.2 of the Form.

111. 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

112. A reporting institution which has been approved by the MA to use the IMM approach to calculate its market risk is required to complete Division F and, where applicable, Division A1(b), (c) or (d) (see paragraph 113), of the Form. This section covers the reporting of regulatory capital for market risk under Division F of the Form using the IMM approach.
113. Even if a reporting institution has the MA's approval to calculate the specific risk charge for interest rate exposures using the IMM approach, the institution must nevertheless apply the STM approach to calculate the market risk capital charge for specific risk for its trading book positions (whether long or short) in:
- (a) n^{th} -to-default credit derivative contracts which fall within section 286(a)(iv) of the Rules (please refer to section B.1.1.4 for the applicable instructions);
 - (b) securitization exposures which fall within section 286(a)(ii) of the Rules (please refer to section B.1.1.2 for the applicable instructions); and
 - (c) exposures which fall within section 286(a)(iii) of the Rules (i.e. correlation trading portfolio) but for which the institution does not have the approval of the MA to calculate a comprehensive risk charge under the IMM approach (please refer to section B.1.1.3 for the applicable instructions).
114. Subject to paragraphs 115 and 116, 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(s)* expressed as ***VaR*** and ***stressed VaR***;
 - (b) where applicable, the market risk capital charge for specific risk for interest rate exposures and equity exposures calculated by the institution's internal model(s) expressed as VaR, stressed VaR, incremental risk charge and/or ***comprehensive risk charge***; and
 - (c) where applicable, the supplemental capital charge referred to in section 318(3) of the Rules in respect of a correlation trading portfolio,
- multiplied by 12.5.
115. A reporting institution may have a portfolio of its market risk positions which fall within a risk category (the relevant portfolio) excluded from its market risk calculation under the IMM approach if the institution is granted an exemption by the MA under section 23A(2)(a) of the Rules. A reporting institution to which such an exemption is granted should use the STM approach to calculate its market risk for the relevant portfolio to which the exemption relates.
116. For the purposes of calculating the market risk capital charge for its positions in foreign exchange (including gold) and exchange rate-related derivative contracts, a

reporting institution should not exclude any of its structural positions from such calculation 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.

C.1. Market risk capital charge calculated by internal models

C.1.1. Division F.1(a) of Form MA(BS)3(IV) - Market risk capital charge for general market risk : VaR and stressed VaR

117. If a reporting institution uses an internal model to calculate the market risk capital charge for general market risk, the institution should report—
- (a) the VaR and the stressed VaR calculated by the internal model as at the last **trading day** of the reporting quarter in column (a) of Division F.1(a) of the Form (if the stressed VaR as at that day is not available, report the latest available stressed VaR); and
 - (b) the average VaR and the average stressed VaR for the last 60 trading days of the reporting quarter⁵ in column (b) of Division F.1(a) of the Form, both for individual risk categories (i.e. items 1.1 to 1.4 in respect of the VaR, and items 2.1 to 2.4 in respect of the stressed VaR, of Division F.1(a) of the Form) and the aggregate of all risk categories (i.e. item 1.5 in respect of the VaR, and item 2.5 in respect of the stressed VaR, of Division F.1(a) of the Form).
118. For the purposes of calculating a stressed VaR, a reporting institution must, in accordance with section 317(2) of the Rules, obtain the prior consent of the MA for the use of a **stressed VaR relevant period** in respect of any portfolio of exposures included in the calculation, and thereafter regularly review, on at least an annual basis, the appropriateness of such a period.
119. 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 or the stressed VaR for the aggregate of all risk categories is not necessarily equal to an arithmetic sum of the VaR or the stressed VaR for individual risk categories because of the correlations across the risk categories.
120. A reporting institution should report in item 1.5(c) of Division F.1(a) of the Form the number of **back-testing exceptions** in relation to the VaR for the last 250 trading days of the reporting quarter (i.e. from the reporting quarter end going backwards) based on

⁵ It is expected that the basis for computing the average stressed VaR, average incremental risk charge or average comprehensive risk charge should be consistent with that of the AI’s computation frequency for the respective market risk capital charge. For instance, if an AI calculates its stressed VaR on a daily basis, then it should calculate a daily average stressed VaR over the last 60 trading days of the reporting quarter; if the AI calculates its stressed VaR on a weekly basis, then a weekly average of the stressed VaR over the specified period should be calculated.

the actual daily changes in portfolio value. Similarly, the institution should, where applicable, report in item 1.5(d) of Division F.1(a) of the Form the number of back-testing exceptions in relation to the VaR 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.

121. The multiplication factors, m_c for the VaR and m_s for the stressed VaR, to be reported respectively in items 1.5(e) and 2.5(e) of Division F.1(a) of the Form are separately 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 in relation only to the VaR (i.e. the larger of item 1.5(c) and item 1.5(d) of Division F.1(a) 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 (the value of item 1.5(e) is equal to item 2.5(e) only if the additional plus factor assigned by the MA for calculating m_c is the same as that assigned for calculating m_s).
122. A reporting institution should not, without the prior consent of the MA, make any significant change to the approach it uses to determine the number of back-testing exceptions under paragraph 121(b).
123. A reporting institution should report the market risk capital charge for general market risk calculated by the internal model expressed as VaR in item 1.7 (or that expressed as stressed VaR in item 2.7) of Division F.1(a) of the Form which is the higher of:

- (a) item 1.5(a), i.e. the VaR for the aggregate of all risk categories as at the last trading day of the reporting quarter (or item 2.5(a), i.e. the institution's stressed VaR for the aggregate of all risk categories as at the last trading day of the reporting quarter (if the stressed VaR as at that day is not available, the latest available stressed VaR)); and
 - (b) item 1.6, i.e. the average VaR for the last 60 trading days of the reporting quarter (item 1.5(b)) times the multiplication factor, m_c , in item 1.5(e) (or item 2.6, i.e. the average stressed VaR for the last 60 trading days of the reporting quarter (item 2.5(b)) times the multiplication factor, m_s , in item 2.5(e)).
124. 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 expressed as VaR (or stressed VaR), 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 in relation to the VaR (or those in items 2.1 to 2.7 in relation to the stressed VaR) of Division F.1(a) of the Form cover both general market risk and specific risk, and the institution is not required to complete Division F.1(b) of the Form.
125. A reporting institution should report in item 3 of Division F.1(a) of the Form the total market risk capital charge for general market risk calculated by internal models expressed as VaR and stressed VaR, which is equal to the sum of items 1.7 and 2.7 of Division F.1(a) of the Form.

C.1.2. Division F.1(b) of Form MA(BS)3(IV) - Market risk capital charge for specific risk : VaR and stressed VaR

126. 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 expressed as VaR and stressed VaR in items 1 and 2 of Division F.1(b) of the Form respectively according to the following instructions:
- (a) report in item 1.1(a) the VaR, and in item 2.1(a) the stressed VaR, 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 (if the stressed VaR as at that day is not available, report the latest available stressed VaR);
 - (b) report in item 1.1(b) the average VaR, and in item 2.1(b) the average stressed VaR, for the last 60 trading days of the reporting quarter⁵;
 - (c) report in item 1.1(c) the number of back-testing exceptions in relation to the VaR for the last 250 trading days of the reporting quarter based on the actual daily changes in portfolio value;
 - (d) report in item 1.1(d) the number of back-testing exceptions in relation to the VaR 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 items 1.1(e) and 2.1(e) respectively the multiplication factors, m_c for the VaR and m_s for the stressed VaR, which are calculated according to paragraph 121 (item 1.1(e) is equal to item 2.1(e) only if the additional plus factor assigned by the MA for calculating m_c is the same as that assigned for calculating m_s);
 - (f) report in item 1.2 the average VaR for the last 60 trading days of the reporting quarter (item 1.1(b)) times the multiplication factor, m_c (item 1.1(e)) (or report in item 2.2 the average stressed VaR for the last 60 trading days of the reporting quarter (item 2.1(b)) times the multiplication factor, m_s (item 2.1(e))); and
 - (g) report in item 1.3 the market risk capital charge for specific risk expressed as VaR, which is the higher of item 1.1(a) and item 1.2 (or report in item 2.3 the market risk capital charge for specific risk expressed as stressed VaR, which is the higher of item 2.1(a) and item 2.2).
127. For the purposes of calculating stressed VaR, a reporting institution must, in accordance with section 317(2) of the Rules, obtain the prior consent of the MA for the use of a stressed VaR relevant period in respect of any portfolio of exposures included in the calculation, and thereafter regularly review, on at least an annual basis, the appropriateness of such a period.
128. A reporting institution should report in item 3 of Division F.1(b) of the Form the total market risk capital charge for specific risk calculated by internal models expressed as VaR and stressed VaR, which is equal to the sum of items 1.3 and 2.3 of Division F.1(b) of the Form.
129. A reporting institution to which paragraph 113 applies may, in addition to calculating the market risk capital charge for specific risk for the relevant exposures under the STM approach, also apply to the MA to include the institution's interest rate exposures referred to in paragraph 113(a) and (b) in its calculation of the market risk capital charge for specific risk expressed as VaR and stressed VaR under the IMM approach.
- C.1.3. Division F.1(c) of Form MA(BS)3(IV) - Market risk capital charge for specific risk : Incremental risk charge, comprehensive risk charge and supplemental capital charge**
130. A reporting institution that models specific risk is subject to the market risk capital charge for specific risk expressed as the incremental risk charge and/or comprehensive risk charge in the following circumstances –

- (a) the institution that has the approval of the MA to model specific risk for interest rate exposures should calculate the incremental risk charge for its trading book positions in interest rate exposures that fall within paragraph (a) of the definition of incremental risk charge in section 281 of the Rules. Failure to obtain such an approval means that the institution has to calculate the market risk capital charge for specific risk for those positions using the STM approach;
 - (b) the institution that has the approval of the MA to model specific risk for both interest rate exposures and equity exposures may, at its discretion, choose to seek the MA's approval to calculate the incremental risk charge for its trading book positions in equity exposures that fall within paragraph (b) of the definition of incremental risk charge in section 281 of the Rules; and
 - (c) the institution that has the approval of the MA to model specific risk for interest rate exposures may seek the MA's approval to calculate the comprehensive risk charge for its trading book positions in a correlation trading portfolio; otherwise the institution has to calculate the market risk capital charge for specific risk for those positions using the STM approach.
131. A reporting institution should report, where applicable, its incremental risk charge and comprehensive risk charge in Sections 1 and 2 of Division F.1(c) of the Form respectively as follows:
- (a) report the latest available incremental risk charge or comprehensive risk charge calculated by the institution (at least once a week, or more frequently as required by the MA, using the internal model) in the following manner (however, incremental risk charge or comprehensive risk charge calculated as at the last trading day of the reporting quarter is preferred) –
 - (i) the incremental risk charge arising from interest rate exposures and equity exposures are to be reported in items 1.1(a) and 1.2(a) respectively, and the aggregate incremental risk charge in item 1.3(a); and
 - (ii) the comprehensive risk charge for the correlation trading portfolio is to be reported in item 2.1(a);
 - (b) similarly report the average incremental risk charge and average comprehensive risk charge for the last 12 weeks of the reporting quarter⁵ in items 1.1(b) to 1.3(b), and in item 2.1(b), of Division F.1(c) of the Form respectively;
 - (c) report the scaling factors, S_i for the incremental risk charge in item 1.3(c), and S_c for the comprehensive risk charge in item 2.1(c). The respective scaling factors are to be 1 or such other value as the MA may specify in a notice in writing given to the institution;

- (d) report the incremental risk charge calculated by the internal model in item 1.4 of Division F.1(c) of the Form, which is derived by multiplying the scaling factor, S_i , in item 1.3(c) by the higher of:
 - (i) item 1.3(a), i.e. the institution's aggregate latest available incremental risk charge of the reporting quarter; and
 - (ii) item 1.3(b), i.e. the institution's average incremental risk charge for the last 12 weeks of the reporting quarter;
 - (e) report the comprehensive risk charge calculated by the internal model in item 2.2 of Division F.1(c) of the Form, which is derived by multiplying the scaling factor, S_c , in item 2.1(c) by the higher of:
 - (i) item 2.1(a), i.e. the institution's latest available comprehensive risk charge of the reporting quarter; and
 - (ii) item 2.1(b), i.e. the institution's average comprehensive risk charge for the last 12 weeks of the reporting quarter;
 - (f) derive the applicable amount of market risk capital charge for specific risk for the correlation trading portfolio to be reported in item 2.4 for the purpose of which, the institution should -
 - (i) calculate the market risk capital charge for specific risk for each of the long and short positions in its correlation trading portfolio using the STM approach in accordance with the instructions in section B.1.1.3, and report the total market risk capital charge for specific risk for those positions in item 2.3.1 (for long positions) or 2.3.2 (for short positions) of Division F.1(c) of the Form;
 - (ii) report in item 2.3 of Division F.1(c) of the Form 8% of the higher of item 2.3.1 and 2.3.2 of Division F.1(c) of the Form as the floor for the comprehensive risk charge; and
 - (iii) report the applicable amount of the comprehensive risk charge for the correlation trading portfolio for the institution in item 2.4 of Division F.1(c) of the Form, which is the higher of item 2.2 and item 2.3.
132. A reporting institution must include the interest rate exposures subject to the incremental risk charge, and those subject to the comprehensive risk charge, in its calculation of VaR and stressed VaR.
133. A reporting institution must not offset its incremental risk charge against the comprehensive risk charge, or offset these two capital charges with other market risk capital charge applicable to the positions covered.
134. A reporting institution that is subject to the stress-testing requirements on correlation trading portfolio as set out in section 4(g) of Schedule 3 to the Rules is required under

section 4(h) to conduct such stress tests at least weekly, and report its stress-testing results to the MA on a quarterly basis unless otherwise advised by the MA. Also, where the stress-testing results indicate a material shortfall of the comprehensive risk charge, the institution should report to the MA as soon as reasonably practicable in all the circumstances of the case. In this connection, the institution should -

- (a) submit its latest stress-testing results on its correlation trading portfolio, including comparisons with the comprehensive risk charge calculated using the institution's internally-developed approach, to its usual supervisory contact for review upon submission of the quarterly CAR Returns, and in any case no later than 6 weeks after each quarter-end (unless otherwise advised by the MA); and
- (b) report to its usual supervisory contact any instances where the stress tests indicate a material shortfall of the comprehensive risk charge as soon as reasonably practicable in all the circumstances of the case. The HKMA would generally consider submission of such exception reports within 3 business days after the business day on which the AI's stress test has identified a material shortfall as a reasonable period.

- 135. If the MA is satisfied that the stress-testing results referred to in section 4(g) of Schedule 3 to the Rules indicate a material shortfall in the comprehensive risk charge of a reporting institution, the MA may impose a supplemental capital charge on the correlation trading portfolio, which should be reported in item 3 of Division F.1(c) of the Form.
- 136. A reporting institution should report in item 4 of Division F.1(c) of the Form (where applicable) the total market risk capital charge for specific risk calculated by internal models expressed as incremental risk charge or comprehensive risk charge, and the supplemental capital charge, as the sum of items 1.4, 2.4 and 3 of Division F.1(c) of the Form.

C.1.4. Division F.1(d) of Form MA(BS)3(IV) - Total market risk capital charge for specific risk under the IMM approach

- 137. A reporting institution should report in Division F.1(d) of the Form the total market risk capital charge for specific risk calculated by internal models under the IMM approach, which equals to the sum of items F.1(b)(3) and F.1(c)(4) of the Form.
- 138. If a reporting institution is not approved by the MA to use the IMM approach to model the VaR, stressed VaR, incremental risk charge and/or comprehensive risk charge, as the case may be, it should report the market risk capital charge for specific risk for debt securities, debt-related derivative contracts and credit derivative contracts in Division A of the Form and that for equities and equity-related derivative contracts in Division B of the Form.

C.1.5. Division F.1(e) of Form MA(BS)3(IV) - Total market risk capital charge under the IMM approach

139. Where a reporting institution uses more than one internal model to calculate the market risk capital charge for general market risk and the market risk capital charge for specific risk, the institution must comply with sections C.1.1, C.1.2 and C.1.3 of the instructions, as the case may be, except that it must apply the section(s) concerned separately to the relevant market risk capital charge generated from each model.
140. A reporting institution should report in Division F.1(e) of the Form its total market risk capital charge under the IMM approach, which is equal to the sum of items F.1(a)3 and F.1(d) of the Form.

C.2 Largest daily losses over the quarter

141. 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 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

142. 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.
143. The total market risk capital charges calculated under the IMM approach should be extracted from Division F.1(e) of the Form and reported in item 2 of Division G of the Form.
144. 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 2012

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, CR-G-12 "Credit Derivatives" and Division 10 of Part 8 of the Rules. 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 those that fall within paragraphs 23 and 25 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. Subject to paragraph 7, for the purposes of calculating the market risk capital charge for specific risk for n^{th} -to-default credit derivative contracts that fall within section 286(a)(iv) of the Rules, a reporting institution should -
 - (a) if the n^{th} -to-default credit derivative contract has an ECAI issue specific rating, apply section 287A(6) or (8) of the Rules, as the case may be, as if the contract

were a securitization exposure in respect of positions in which the institution is the protection seller;

- (b) for other n^{th} -to-default credit derivative contracts, apply section 287 and Division 10 of the Rules.

7. For the purposes of paragraph 6:

- (a) where a reporting institution has a position in one of the reference obligations underlying a first-to-default credit derivative contract and the contract hedges that position, the institution may offset with respect to the hedged amount (i) the market risk capital charge for specific risk for its position in the reference obligation; and (ii) that part of the market risk capital charge for specific risk for the credit derivative contract that relates to that particular reference obligation;
- (b) where a reporting institution has multiple positions in the reference obligations underlying a first-to-default credit derivative contract, the offsetting of market risk capital charge specified in paragraph (a) above is allowed only for its positions in the underlying reference obligation having the lowest market risk capital charge for specific risk; and
- (c) to avoid doubt, for the purposes of paragraphs (a) and (b) above, a reporting institution should-
 - (i) first offset the long and short positions in identical first-to-default credit derivative contracts before applying these two paragraphs as appropriate; and
 - (ii) not offset the market risk capital charge for specific risk for its position in any n^{th} -to-default credit derivative contract where n is greater than 1 with the market risk capital charge for its position in any underlying reference obligation.

8. 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.

9. 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.
- 10. Subject to paragraph 7, 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 11, 12 or 13 of this Annex. If paragraph 11, 12 or 13 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.
- 11. 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.

- 12. A reporting institution may offset 80% of the market risk capital charge for specific risk for 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 11 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.

13. A reporting institution may offset partially the market risk capital charge for specific risk for 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 11(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 11(a) or 12 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 12 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

14. 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.
15. 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.
- 16. 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.
- 17. 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.
- 18. 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.
- 19. If a reporting institution has purchased a credit-linked note, the institution should record a long position in the note.
- 20. 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

- 21. Subject to paragraph 113 of Section C in the main text, a reporting institution should comply with section C of the completion instructions and the requirements specified in Schedule 3 to the Rules to apply the IMM approach to calculate the market risk capital charge for credit derivative contracts booked in its trading book.
- 22. 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

- 23. 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.

24. 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.
25. 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.
26. 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.
27. There is no counterparty credit risk for a reporting institution as the purchaser or issuer of a credit-linked note.
28. 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

29. 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.
30. 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 for calculation of market risk capital charges under STM approach

Suppose as at 31 December 20XX, Example Bank Ltd. has the following positions in non-securitization interest rate exposures that (a) do not fall within a correlation trading portfolio, and (b) are also not nth-to-default credit derivative contracts:

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 forward rate agreement 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(a), 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(a), 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(a), 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: $\text{USD}100,000 \times 10 \times 100.0625\% / 0.9423 = \text{USD}1,061,896 = \text{HKD}8,283\text{K}$ 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:

<u>Period</u>	<u>Zero-coupon yields</u>
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.

$$ZC(18 \text{ months}) = (6.16\% + 6.69\%) / 2 = 6.425\%$$

Similarly,

$$ZC(30 \text{ months}) = (6.69\% + 7.07\%) / 2 = 6.88\%$$

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

$$\begin{aligned} &= \text{HKD}150\text{M} \times \left(\frac{0.08}{(1+0.0581 \times 0.5)} + \frac{0.08}{(1+0.06425)^{1.5}} + \frac{1.08}{(1+0.0688)^{2.5}} \right) \\ &= \text{HKD}159,766\text{K} \end{aligned}$$

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

$$\begin{aligned} &= \text{HKD}150\text{M} \times \frac{1.055}{(1+0.0581 \times 0.5)} \\ &= \text{HKD}153,783\text{K} \end{aligned}$$

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,
 $ZC(9 \text{ months}) = (5.81\% + 6.16\%) / 2 = 5.985\%$

Amounts to be reported:

$$\begin{aligned} \text{Long position} &= \text{HKD}50\text{M} / (1 + 0.05985 \times 0.75) \\ &= \text{HKD}50\text{M} \times 0.957 \\ &= \text{HKD}47,852\text{K} \end{aligned}$$

$$\begin{aligned}
\text{Short position} &= \text{HKD}50\text{M} / (1 + 0.0581 \times 0.5) \\
&= \text{HKD}50\text{M} \times 0.9718 \\
&= \text{HKD}48,589\text{K}
\end{aligned}$$

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,
 $\text{ZC}(15 \text{ months}) = 6.16\% + (6.69\% - 6.16\%) \times 0.25 = 6.2925\%$

$$\begin{aligned}
\text{Long position} &= \text{HKD}20\text{M} / (1 + 0.062925)^{1.25} \\
&= \text{HKD}18,531\text{K}
\end{aligned}$$

$$\begin{aligned}
\text{Short position} &= \text{HKD}20\text{M} / (1 + 0.05985 \times 0.75) \\
&= \text{HKD}19,141\text{K}
\end{aligned}$$

7. Report the cap as 3 written call option contracts on 6-month forward rate agreement 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 -

$$\begin{aligned}
&\text{a long position in the } >6 \text{ to } 12 \text{ months time band} \\
&= \text{GBP}2\text{M} \times 0.055 \times 0.9346 \\
&= \text{HKD}1,234\text{K equivalent}
\end{aligned}$$

$$\begin{aligned}
&\text{a short position in the } >3 \text{ to } 6 \text{ months time band} \\
&= \text{GBP}2\text{M} \times 0.055 \times 0.9674
\end{aligned}$$

$$= \text{HKD1,277K equivalent}$$

For the second option contract -

a long position in the >1.0 to 1.9 years time band

$$= \text{GBP2M} \times 0.17 \times 0.9009$$

$$= \text{HKD3,676K equivalent}$$

a short position in the >6 to 12 months time band

$$= \text{GBP2M} \times 0.17 \times 0.9346$$

$$= \text{HKD3,813K equivalent}$$

For the third option contract -

a long position in the >1.9 to 2.8 years time band

$$= \text{GBP2M} \times 0.225 \times 0.8673$$

$$= \text{HKD4,683K equivalent}$$

a short position in the >1.0 to 1.9 years time band

$$= \text{GBP2M} \times 0.225 \times 0.9009$$

$$= \text{HKD4,865K equivalent}$$

(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,

$$\text{Long position} = \text{EUR5M} / (1 + 0.0325 \times 0.25)$$

$$= \text{HKD49,597K equivalent}$$

$$\text{Short position} = \text{HKD25M} / (1 + 0.0563 \times 0.25)$$

$$= \text{HKD24,653K}$$

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

9. Report a long position of $\text{HKD110} \times 100,000 = \text{HKD11M}$ in Division B, item 1, US column.
10. Report a long position of $\text{HKD30} \times 25,000 = \text{HKD750K}$ 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:

$$= (25,000 \times \text{HKD}30 \times 16\%) - [25,000 \times \text{HKD}(33 - 30)]$$

$$= \text{HKD}45\text{K}$$

11. Report $\text{HKD}50 \times 10,000 = \text{HKD}500\text{K}$ 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 $\text{HKD}10\text{M}$ in Division A.1(a), item 1.11. No reporting is required in Division A.2.
13. Report a short position of $\text{HKD}1\text{M}$ in Division A.1(a), 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

$$= \text{HKD}1\text{M} \times \left(\frac{0.08}{(1 + 0.0616)} + \frac{0.08}{(1 + 0.0669)^2} + \frac{1.08}{(1 + 0.0707)^3} \right)$$

$$= \text{HKD}1,026\text{K}$$

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 million¹, 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 (coupon of not less than 3%)	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
	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

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	<u>\$3,000,000</u>
	\$4,580,000

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

**Market risk capital charge factors for
specific risk or deductions applicable to
securitization exposures held in the trading book**
(as extracted from the Rules)

TABLE 28A

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
APPLICABLE TO LONG-TERM CREDIT QUALITY GRADES UNDER STC(S) APPROACH
(EXCLUDING RE-SECURITIZATION EXPOSURES)

Long-term credit quality grade	Market risk capital charge factor	Deduction
1	1.6%	not applicable
2	4.0%	not applicable
3	8.0%	not applicable
4	28% (for investing institutions)	deduction from core capital and supplementary capital (for originating institutions)
5	not applicable	deduction from core capital and supplementary capital

TABLE 28B

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
APPLICABLE TO SHORT-TERM CREDIT QUALITY GRADES UNDER STC(S) APPROACH
(EXCLUDING RE-SECURITIZATION EXPOSURES)

Short-term credit quality grade	Market risk capital charge factor	Deduction
1	1.6%	not applicable
2	4.0%	not applicable
3	8.0%	not applicable
4	not applicable	deduction from core capital and supplementary capital

TABLE 28C

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
 APPLICABLE TO LONG-TERM CREDIT QUALITY GRADES UNDER STC(S) APPROACH
 (RE-SECURITIZATION EXPOSURES)

Long-term credit quality grade	Market risk capital charge factor	Deduction
1	3.2%	not applicable
2	8.0%	not applicable
3	18.0%	not applicable
4	52% (for investing institutions)	deduction from core capital and supplementary capital (for originating institutions)
5	not applicable	deduction from core capital and supplementary capital

TABLE 28D

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
 APPLICABLE TO SHORT-TERM CREDIT QUALITY GRADES UNDER STC(S) APPROACH
 (RE-SECURITIZATION EXPOSURES)

Short-term credit quality grade	Market risk capital charge factor	Deduction
1	3.2%	not applicable
2	8.0%	not applicable
3	18.0%	not applicable
4	not applicable	deduction from core capital and supplementary capital

TABLE 28E

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS APPLICABLE TO LONG-TERM CREDIT QUALITY GRADES UNDER RATINGS-BASED METHOD IN IRB(S) APPROACH (EXCLUDING RE-SECURITIZATION EXPOSURES)

Long-term credit quality grade	Market risk capital charge factor			Deduction
	A	B	C	
1	0.56%	0.96%	1.60%	not applicable
2	0.64%	1.20%	2.00%	not applicable
3	0.80%	1.44%	2.80%	not applicable
4	0.96%	1.60%	2.80%	not applicable
5	1.60%	2.80%	2.80%	not applicable
6	2.80%	4.00%	4.00%	not applicable
7	4.80%	6.00%	6.00%	not applicable
8	8.00%	8.00%	8.00%	not applicable
9	20.00%	20.00%	20.00%	not applicable
10	34.00%	34.00%	34.00%	not applicable
11	52.00%	52.00%	52.00%	not applicable
12	not applicable	not applicable	not applicable	deduction from core capital and supplementary capital

TABLE 28F

MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS APPLICABLE TO SHORT-TERM CREDIT QUALITY GRADES UNDER RATINGS-BASED METHOD IN IRB(S) APPROACH (EXCLUDING RE-SECURITIZATION EXPOSURES)

Short-term credit quality grade	Market risk capital charge factor			Deduction
	A	B	C	
1	0.56%	0.96%	1.60%	not applicable
2	0.96%	1.60%	2.80%	not applicable
3	4.80%	6.00%	6.00%	not applicable
4	not applicable	not applicable	not applicable	deduction from core capital and supplementary capital

TABLE 28G

**MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
APPLICABLE TO LONG-TERM CREDIT QUALITY GRADES UNDER RATINGS-BASED
METHOD IN IRB(S) APPROACH (RE-SECURITIZATION EXPOSURES)**

Long-term credit quality grade	Market risk capital charge factor		Deduction
	Senior	Non-senior	
	re-securitization positions A	re-securitization positions B	
1	1.60%	2.40%	not applicable
2	2.00%	3.20%	not applicable
3	2.80%	4.00%	not applicable
4	3.20%	5.20%	not applicable
5	4.80%	8.00%	not applicable
6	8.00%	12.00%	not applicable
7	12.00%	18.00%	not applicable
8	16.00%	28.00%	not applicable
9	24.00%	40.00%	not applicable
10	40.00%	52.00%	not applicable
11	60.00%	68.00%	not applicable
12	not applicable	not applicable	deduction from core capital and supplementary capital

TABLE 28H

**MARKET RISK CAPITAL CHARGE FACTORS FOR SPECIFIC RISK OR DEDUCTIONS
APPLICABLE TO SHORT-TERM CREDIT QUALITY GRADES UNDER RATINGS-BASED
METHOD IN IRB(S) APPROACH (RE-SECURITIZATION EXPOSURES)**

Short-term credit quality grade	Market risk capital charge factor		Deduction
	Senior	Non-senior	
	re-securitization positions A	re-securitization positions B	
1	1.60%	2.40%	not applicable
2	3.20%	5.20%	not applicable
3	12.00%	18.00%	not applicable
4	not applicable	not applicable	deduction from core capital and supplementary capital