CONSULTATION PAPER

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Proposals for the Implementation of Basel II in Singapore - Phase 2

MAS

Monetary Authority of Singapore

PREFACE

In June 2004, the Basel Committee on Banking Supervision ("BCBS") issued its report on "International Convergence of Capital Measurement and Capital Standards: A Revised Framework" (commonly known as Basel II).

Following the Phase 1 consultation paper issued in August 2005, this consultation paper proposes standards for the various credit risk approaches under Basel II.

MAS invites comments from Singapore-incorporated banks and other interested parties. Please note that any comments received may be made public unless confidentiality is specifically requested. Electronic submission is encouraged.

The public consultation period ends on **14 Apr 2006**. Please direct comments to:

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Monetary Authority of Singapore
10 Shenton Way, MAS Building
Singapore 079117
Fax : (65) 62203973
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DRAFT TEXT OF MAS NOTICE TO BANKS 6XX: RISK-BASED CAPITAL ADEQUACY REQUIREMENTS FOR BANKS INCORPORATED IN SINGAPORE

PART VII: CREDIT RISK

Division 1: Introduction to Calculation of Credit RWA

Sub-division 1: Introduction

7.1.1 The Credit RWA of a Reporting Bank is the sum of its SA(CR) RWA calculated in accordance with sub-division 3, IRBA RWA calculated in accordance with sub-division 4, Equity RWA calculated in accordance with sub-division 5 and Securitisation RWA calculated in accordance with sub-division 6.

Sub-division 2: Exposures Included in the Calculation of SA(CR) RWA and IRBA RWA

7.1.2 A Reporting Bank shall include in its calculation of either SA(CR) RWA or IRBA RWA:

(a) any on-balance sheet asset; and

(b) any off-balance sheet item[1],

provided they are not any of the following:

(i) any equity exposure or PE/VC investment designated by the Reporting Bank in accordance with Division 5;

(ii) any securitised exposure that meets the clean risk transfer requirements set out in Division 6[2]; or

(iii) any exposure designated by the Reporting Bank as a trading instrument or transaction in accordance with Division 1 of Part VIII.[3]

Sub-division 3: Calculation of SA(CR) RWA

7.1.3 A Reporting Bank using the SA(CR) shall calculate its SA(CR) RWA by:

(a) applying the exposure measurement guidelines in Division 2 to calculate E, or where applicable E*, for any exposure or class of exposures for which the Reporting Bank is using the SA(CR) to

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1 For avoidance of doubt, off-balance sheet items would include but are not limited to:
(a) any pre-settlement counterparty exposure arising from an OTC derivative transaction, whether such OTC derivative transaction is designated by the Reporting Bank as a banking or trading book exposure;
(b) the underlying securities in a credit derivative transaction or an OTC derivative transaction that is in substance similar to a forward purchase or credit substitute; and
(c) any pre-settlement counterparty exposure arising from an SFT, whether such SFT is designated by the Reporting Bank as a banking or trading book exposure.

2 This paragraph should be read in conjunction with Part III on the scope of application.

3 For avoidance of doubt, the pre-settlement counterparty exposures arising from any OTC derivative transaction or SFT cannot be designated by a Reporting Bank as a trading instrument or transaction. All pre-settlement counterparty exposures arising from OTC derivative transactions and SFTs shall be included for calculating either SA(CR) RWA or IRBA RWA.

calculate the credit risk-weighted exposure amount (hereinafter referred to as "SA(CR) exposure");

(b) categorising that SA(CR) exposure in accordance with sub-division 1 of Division 3;

(c) allocating an applicable risk weight for that SA(CR) exposure in accordance with sub-division 2 of Division 3;

(d) calculating the credit risk-weighted exposure amount for that SA(CR) exposure using the following formula:

Credit RWE = Exposure X RW ,

where

(i) Credit RWE refers to the credit risk-weighted exposure amount for that SA(CR) exposure;

(ii) Exposure refers to E, or where applicable E*, for that SA(CR) exposure calculated in accordance with sub-paragraph (a) above; and

(iii) RW refers to the applicable risk weight for that SA(CR) exposure determined in accordance with sub-paragraph (c) above; and

(e) summing the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (d) above for all its SA(CR) exposures.

Sub-division 4: Calculation of IRBA RWA

7.1.4 A Reporting Bank using the IRBA shall calculate its IRBA RWA by:

(a) applying the exposure measurement guidelines in Division 2 to calculate EAD, or where applicable EAD*, for any exposure or class of exposures for which the Reporting Bank is using the IRBA to calculate the credit risk-weighted exposure amount (hereinafter referred to as "IRBA exposure");

(b) categorising that IRBA exposure in accordance with sub-division 4 of Division 4;

(c) calculating K_{corp}, K_{sm}, K_{sov}, K_{bank}, K_{sl}, K_{hv}, K_{mort}, K_{qrre}, K_{oret}, K_{cp}, K_{sb}, K_{rp} or K_{def}, whichever is applicable to that IRBA exposure based on the categorisation in sub-paragraph (b) above, in accordance with sub-divisions 7, 8, 9 and 11 respectively of Division 4;

(d) if the IRBA exposure is categorised under the SL asset sub-class and the Reporting Bank is using the supervisory slotting criteria to calculate the credit risk-weighted exposure amounts for such exposures, determining RW_{slot} for that IRBA exposure in accordance with Annex 7A;

(e) calculating the credit risk-weighted exposure amount for that IRBA exposure as follows:

(i) for an IRBA exposure categorised under the SL asset sub-class that is not in default and for which the Reporting Bank is using the supervisory slotting criteria to calculate the credit risk-weighted exposure amount, using the following formula:

$$\text{Credit RWE} = RW_{slot} \text{ X } EAD \text{ ,}$$

where

(A) Credit RWE refers to the credit risk-weighted exposure amount for that IRBA exposure;

(B) RW_{slot} refers to RW_{slot} determined in accordance with sub-paragraph (d) above; and

(C) EAD refers to EAD, or where applicable EAD*, for that IRBA exposure calculated in accordance with sub-paragraph (a) above; and

(ii) for all other IRBA exposures, using the following formula:

$$\text{Credit RWE} = K \text{ X } 12.5 \text{ X } EAD \text{ ,}$$

where

(A) Credit RWE refers to the credit risk-weighted exposure amount for that IRBA exposure;

(B) K refers to K_{corp}, K_{sm}, K_{sov}, K_{bank}, K_{sl}, K_{hv}, K_{mort}, K_{qrre}, K_{oret}, K_{cp}, K_{sp}, K_{rp} or K_{def}, whichever is applicable to that IRBA exposure based on the categorisation in sub-paragraph (b) above, calculated in accordance with sub-paragraph (c) above; and

(C) EAD refers to EAD, or where applicable EAD*, for that IRBA exposure calculated in accordance with sub-paragraph (a) above;

(f) summing the credit risk-weighted exposure amounts calculated in accordance with sub-paragraph (d) above for all its IRBA exposures; and

(g) multiplying the result at sub-paragraph (f) above by a scaling factor.[4]

Sub-division 5: Calculation of Equity RWA

Note: The Authority will consult on the rules for calculating Equity RWA at a later date.

[4] The current best estimate of the scaling factor is 1.06. This scaling factor is subject to change, taking into account further guidance from the BCBS.

Sub-division 6: Calculation of Securitisation RWA

Note: The Authority will consult on the rules for calculating Securitisation RWA at a later date.

Division 2: Measurement of Exposures under SA(CR) And IRBA

(This Division sets out guidelines for the measurement of exposures under the SA(CR) and IRBA. The Authority will take into account the observance of these guidelines by a Reporting Bank in assessing whether the Reporting Bank has complied with section 10(2) of the Banking Act.)

Sub-division 1: Introduction

7.2.1 A Reporting Bank should apply the guidelines on exposure measurement set out in this Division to calculate:

(a) E, or where applicable E*, for any SA(CR) exposure; and

(b) EAD, or where applicable EAD*, for any IRBA exposure.

7.2.2 Unless provided for in this Notice, a Reporting Bank should calculate:

(a) E, or where applicable E*, for any SA(CR) exposure net of any individual impairment provision[5] attributable to such SA(CR) exposure as determined in accordance with the Accounting Standards; and

(b) EAD, or where applicable EAD*, for any IRBA exposure gross of any individual impairment provision or partial write-offs attributable to such IRBA exposure as determined in accordance with the Accounting Standards.

Sub-division 2: Measurement of E or EAD for On-balance Sheet Assets

7.2.3 For each on-balance sheet asset, E or EAD, whichever is applicable, should be the carrying value of the asset as determined in accordance with the Accounting Standards.[6,7]

7.2.4 A Reporting Bank should not recognise the effect of netting arrangements covering on-balance sheet assets and liabilities.

Note: The Authority is reviewing whether, and if so how, to recognise on-balance sheet netting, and will consult on this at a later date.

[5] For avoidance of doubt, individual impairment provision is also commonly known as specific provision.

[6] For any asset, E or EAD, whichever is applicable, should be equal to the fair value of that asset presented in the balance sheet except:
(a) for any asset held at cost, E or EAD, whichever is applicable, should be equal to the cost of the asset presented in the balance sheet;
(b) for any AFS debt security or AFS loan, E or EAD, whichever is applicable, should be equal to the fair value of that AFS debt security or AFS loan gross of any unrealised fair value gains or losses on revaluation of that AFS debt security or AFS loan to be excluded from Tier 1 Capital pursuant to paragraph 6.1(b) of Division 1 of Part VI.

[7] Guideline: Foreign exchange transaction or translation gains or losses from foreign currency-denominated on-balance sheet assets as well as interest earned on fixed income instruments should be allocated to the exposure to which they accrue.

Sub-division 3: Measurement of E or EAD for Off-balance Sheet Items

7.2.5 For each off-balance sheet item, other than pre-settlement counterparty exposures arising from OTC derivative transactions or SFTs, a Reporting Bank should calculate E or EAD, whichever is applicable, by multiplying the notional amount[8] of each item[9] with:

(a) the applicable credit conversion factor set out in Annex 7B if that item is an SA(CR) exposure; or

(b) the applicable credit conversion factor set out in Annex 7C if that item is an IRBA exposure, unless the Reporting Bank is using the A-IRBA or the IRBA for the IRBA retail asset class, in which case it may use its own internal estimates of credit conversion factors[10] in certain instances.[11]

Sub-division 4: Recognition of Eligible Financial Collateral and Eligible IRBA Collateral for On-balance Sheet and Off-balance Sheet Transactions Other than OTC Derivative Transactions and Securities Financing Transactions (SFTs)

7.2.6 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral[12] or both for any transaction other than OTC derivative transactions and SFTs may recognise the effect of such collateral in accordance with paragraphs 7.2.8 to 7.2.13 below, provided the Reporting Bank observes Annex 7E.

7.2.7 A Reporting Bank using the SA(CR) should not recognise the effect of eligible financial collateral if such collateral is already reflected in the issue-specific external credit assessment of the SA(CR) exposure.

7.2.8 Subject to paragraph 7.2.9, a Reporting Banking using the SA(CR) should use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral. The Reporting Bank should apply the chosen approach consistently to the entire banking group and should not use a combination of both approaches.

7.2.9 For pre-settlement counterparty exposures arising from transactions in the trading book, a Reporting Bank using SA(CR) should use only the FC(CA) to recognise the effect of eligible financial collateral.

7.2.10 A Reporting Bank using the SA(CR) and the FC(SA) may recognise the effect of eligible financial collateral in accordance with sub-division 3 of Division 3. The remaining paragraphs in this sub-division do not apply to a Reporting Bank using the FC(SA).

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8 For avoidance of doubt, the notional amount of an off-balance sheet item refers to the amount that has been committed but is as yet undrawn.

9 Guideline: Foreign exchange transaction or translation gains or losses from foreign currency-denominated off-balance sheet items should be allocated to the exposure to which they accrue.

10 Guideline: A Reporting Bank using the A-IRBA should calculate historical EAD using a default-weighted average and not a time-weighted average when making its own internal estimates of credit conversion factors.

11 Exposures which receive a 100% CCF under the F-IRBA will continue to have the same CCF under the A-IRBA.

12 A list of eligible financial collateral and eligible IRBA collateral can be found in Annex 7D.

7.2.11 A Reporting Bank using the SA(CR) and the FC(CA) may calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with Annex 7F and substitute E* for E when calculating the credit risk-weighted exposure amount for that SA(CR) exposure under sub-division 3 of Division 1.

7.2.12 A Reporting Bank using the F-IRBA and the FC(CA)[13] may calculate E*, the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7F and use E* to calculate LGD* in accordance with sub-division 7 of Division 4[14].

7.2.13 A Reporting Bank using the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD, provided the Reporting Bank observes Annex 7E.

Sub-division 5: Measurement of E or EAD for Pre-settlement Counterparty Exposures Arising from OTC Derivative Transactions

7.2.14 For each OTC derivative transaction that meets the characteristics at Annex 7K, a Reporting Bank should calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from that OTC derivative transaction using the current exposure method by adding:

(a) the replacement cost (obtained by marking to market) of the OTC derivative transaction or in the case of an OTC derivative transaction with negative replacement cost, a value of zero[15]; and

(b) the amount for potential future exposure obtained by applying the appropriate CCF set out in Annex 7L to the notional amount of the OTC derivative transaction.

7.2.15 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for any OTC derivative transaction may recognise the effect of such collateral in accordance with paragraphs 7.2.86 to 7.2.20 below, provided the Reporting Bank observes Annex 7E.

7.2.16 A Reporting Bank using the SA(CR) should use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral for OTC derivative transactions in the banking book. The Reporting Bank should apply the chosen approach consistently to the entire banking group and should not use a combination of both approaches. For pre-settlement counterparty exposures arising from OTC derivative transactions in the trading book, a Reporting Bank using the SA(CR) should use only the FC(CA) to recognise the effect of eligible financial collateral.

7.2.17 A Reporting Bank using the SA(CR) and FC(SA) may recognise the effect of eligible financial collateral for OTC derivative transactions in accordance with sub-division 3 of Division 3.

7.2.18 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for OTC derivative transactions that are not covered by a qualifying bilateral netting agreement may:

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[13] The FC(SA) is not available to a Reporting Bank using the F-IRBA.

[14] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of E*.

[15] Guideline: Foreign exchange transaction or translation gains or losses from foreign currency-denominated OTC derivative transactions should be allocated to the exposure to which they accrue.

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with Annex 7F and substitute E* for E when calculating the credit risk-weighted exposure amount for that SA(CR) exposure under sub-division 3 of Division 1; and

(b) if it is using the F-IRBA and the FC(CA)[16], calculate E*, the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7F and use E* to calculate LGD* in accordance with sub-division 7 of Division 4.[17]

7.2.19 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for OTC derivative transactions that are covered by a qualifying bilateral netting agreement may:

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the exposure adjusted for eligible financial collateral, for all its SA(CR) exposures to any single counterparty covered by the netting agreement in accordance with Annex 7M and substitute E* for E when calculating the credit risk-weighted exposure amount for its SA(CR) exposures to that counterparty under sub-division 3 of Division 1; and

(b) if it is using the F-IRBA and the FC(CA), calculate E*, the exposure adjusted for eligible financial collateral and eligible IRBA collateral, for all its IRBA exposures to any single counterparty covered by the netting agreement in accordance with Annex 7M and use E* to calculate LGD* in accordance with sub-division 7 of Division 4.[18]

7.2.20 A Reporting Bank using the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD, provided the Reporting Bank observes Annex 7E.

7.2.21 Aside from the pre-settlement counterparty exposure in an OTC derivative transaction calculated under paragraphs 7.2.14, 7.2.18 and 7.2.19 above, a Reporting Bank is also exposed to the risk of the underlying securities in a credit derivative transaction or an OTC derivative transaction that is in substance similar to a forward purchase or credit substitute. Accordingly, a Reporting Bank should calculate E or EAD, whichever is applicable, for such exposures in accordance with sub-division 7 of this Division.

> Note: The Authority will consult on the rules relating to (a) the calculation of E or EAD, whichever is applicable, for OTC derivative transactions that are covered by qualifying bilateral netting agreements, using the standardised method and the internal models method that applies the concept of expected positive exposure; and (b) cross-product netting, at a later date.

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[16] The FC(SA) is not available to a Reporting Bank using the F-IRBA.

[17] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of E*.

[18] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of E*.

Sub-division 6: Measurement of E or EAD for Pre-Settlement Counterparty Exposures Arising from SFTs

7.2.22 An SFT that meets the characteristics at Annex 7K should be treated in substance as similar to collateralised lending for the purposes of this Notice, notwithstanding the wide range of legal contractual forms that could be used for SFTs.

7.2.23 A Reporting Bank that has lent a security in an SFT that falls within paragraph 7.2.22 above should calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from that SFT by adding:

(a) the latest fair market value of the security lent; and

(b) the product of the latest fair market value of the security lent and H_E , where H_E is either:

   (i) the standard supervisory haircut applicable to the security lent as specified in Annex 7H; or

   (ii) the Reporting Bank's own estimate of the haircut applicable to the security lent determined in accordance with Annex 7I.

7.2.24 A Reporting Bank that has lent cash in an SFT that falls within paragraph 7.2.22 above should calculate E or EAD, whichever is applicable, for the pre-settlement counterparty exposure arising from that SFT by adding:

(a) the amount of cash lent; and

(b) accrued interest on the cash lent.

7.2.25 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for any SFT may recognise the effect of such collateral in accordance with paragraphs 7.2.82.26 to 7.2.30 below, provided the Reporting Bank observes Annex 7E.

7.2.26 A Reporting Bank using the SA(CR) should use either the FC(SA) or the FC(CA) to recognise the effect of eligible financial collateral for SFTs in the banking book. The Reporting Bank should apply the chosen approach consistently to the entire banking book and should not use a combination of both approaches. For pre-settlement counterparty exposures arising from SFTs in the trading book, a Reporting Bank using SA(CR) should use only the FC(CA) to recognise the effect of eligible financial collateral.

7.2.27 A Reporting Bank using the SA(CR) and FC(SA) may recognise the effect of eligible financial collateral for SFTs in accordance with sub-division 3 of Division 3.

7.2.28 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for SFTs that are not covered by a qualifying bilateral netting agreement may:

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the SA(CR) exposure adjusted for eligible financial collateral, in accordance with Annex 7F and substitute E* for E when calculating the credit risk-weighted exposure amount for that SA(CR) exposure under sub-division 3 of Division 1; and

(b) if it is using the F-IRBA and the FC(CA)[19], calculate E*, the IRBA exposure adjusted for eligible financial collateral, in accordance with Annex 7F and use E* to calculate LGD* in accordance with sub-division 7 of Division 4.[20]

7.2.29 A Reporting Bank using the A-IRBA or the IRBA for the IRBA retail asset class may take collateral into account when deriving its own estimates of LGD for SFTs that are not covered by a qualifying bilateral netting agreement, provided the Reporting Bank observes Annex 7E.

7.2.30 A Reporting Bank that has taken eligible financial collateral, eligible IRBA collateral or both for SFTs that are covered by a qualifying bilateral netting agreement may:

(a) if it is using the SA(CR) and the FC(CA), calculate E*, the exposure adjusted for eligible financial collateral, for all its SA(CR) exposures to any single counterparty covered by the netting agreement in accordance with Annex 7M (if the Reporting Bank is using supervisory haircuts or own-estimate haircuts) or Annex 7N (if the Reporting Bank is using VaR models) and substitute E* for E when calculating the credit risk-weighted exposure amount for its SA(CR) exposures to that counterparty under sub-division 3 of Division 1; and

(b) if it is using the IRBA (whether F-IRBA, A-IRBA or IRBA for the IRBA retail asset class) and the FC(CA), calculate EAD*, the exposure adjusted for eligible financial collateral and eligible IRBA collateral, for all its IRBA exposures to any single counterparty covered by the netting agreement in accordance with Annex 7M (if the Reporting Bank is using supervisory haircuts or own-estimate haircuts) or Annex 7N (if the Reporting Bank is using VaR models), and substitute EAD* for EAD for its IRBA exposures to that counterparty when calculating IRBA RWA under sub-division 4 of Division 1.[21]

7.2.30 Notwithstanding paragraphs 7.2.24, 7.2.25, 7.2.28 and 7.2.30, a Reporting Bank using FC(CA) to recognise the effect of eligible financial collateral, eligible IRBA collateral, or both for qualifying SFTs with a core market participant that meet the conditions in Annex 7Q, may apply $H_E = H_C = 0$ in place of the haircuts available under FC(CA) in Annex 7H and Annex 7I.[22]

Note: The Authority will consult on the rules relating to (a) the calculation of E or EAD, whichever is applicable, for SFTs that are covered by qualifying bilateral netting agreements, using the internal models method that applies the concept of expected positive exposure; and (b) cross product netting, at a later date.

[19] The FC(SA) is not available to a Reporting Bank using the F-IRBA.
[20] For avoidance of doubt, the EAD for any IRBA exposure is not affected by this calculation of E*.
[21] For avoidance of doubt, the Reporting Bank should not recognise the effect of eligible financial collateral, eligible IRBA collateral or both by adjusting LGD.
[22] For avoidance of doubt, this carve-out approach is not available to Reporting Banks using VaR models as per Annex 7M to calculate E* or EAD*, whichever is applicable.

Sub-division 7: Measurement of E or EAD for Credit Risks of Underlying Securities in Credit Derivative Transactions and OTC Derivative Transactions Similar in Substance to a Forward Purchase or Credit Substitute

7.2.31 Where a Reporting Bank has provided credit protection through a first-to-default credit derivative or through a second-to-default credit derivative, E or EAD, whichever is applicable, should be equal to the nominal amount of the credit protection.[23] This does not apply to any exposure that falls within the definition of a securitisation exposure.

7.2.32 Where a Reporting Bank has provided credit protection through a pooled credit derivative, E or EAD, whichever is applicable, should be equal to the nominal amount of the credit protection.

7.2.33 Where a Reporting Bank has provided unfunded credit protection via a credit default swap, E or EAD, whichever is applicable, should be equal to the nominal amount of the credit protection.

7.2.34 Where a Reporting Bank has provided unfunded credit protection via a total rate of return swap, E or EAD, whichever is applicable, should be equal to the nominal amount of the credit protection less the amount of any depreciation payments made to the protection buyer and recognised in the profit and loss account of the Reporting Bank.

7.2.35 Where a Reporting Bank has provided funded credit protection, E or EAD, whichever is applicable, should be equal to the sum of:

(a) the nominal amount of the credit protection; and

(b) the carrying value of the collateral placed with the protection buyer.

7.2.36 Where a Reporting Bank has provided credit protection (whether funded or unfounded) through a proportionate structure, i.e. where the maximum possible payout in respect of any particular reference asset is capped at a pre-determined proportion of the notional amount of the credit protection, the Reporting Bank should distinguish individual sub-exposures equal to the proportionate amount of credit protection in respect of each reference asset before applying paragraphs 7.2.35 to 7.2.36 above.

7.2.38 Where a Reporting Bank has assumed the underlying risks of an asset through a forward purchase[24] or an OTC derivative transaction that is in substance similar to a forward purchase, E or EAD, whichever is applicable, should be equal to the nominal amount of the forward purchase transaction.

7.2.39 Where a Reporting Bank is exposed to credit risks in credit derivative transactions with structures that are not explicitly addressed in paragraphs 7.2.32 to 7.2.38, the Reporting Bank should consult the Authority on the appropriate treatment in the measurement of E or EAD, whichever is applicable.

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[23] The potential exposure to multiple risk factors is taken into account in the determination of risk weights under the SA(CR) or K under the IRBA. Please refer to sub-division 3 in Division 3 and sub-division 10 in Division 4.

[24] Includes forward asset purchases, forward deposits, and partly paid shares and securities.

Division 3: SA(CR)

Sub-division 1: Categorisation Of SA(CR) Exposures

(This sub-division sets out guidelines for the categorisation of exposures under the SA(CR). The Authority will take into account the observance of these guidelines by a Reporting Bank in assessing whether the Reporting Bank has complied with section 10(2) of the Banking Act.)

7.3.1 A Reporting Bank should categorise any SA(CR) exposure that is not past due for more than 90 days into one of the following categories:

(a) cash items, which consists of cash and cash equivalents, gold bullion held in the Reporting Bank's own vaults or on an allocated basis in the vaults of another entity to the extent that it is backed by gold bullion liabilities and all receivable funds arising from transactions that are settled on a delivery-versus-payment basis which are outstanding up to and including the fifth business day after the settlement date;

(b) exposures to central governments and central banks, which consists of any SA(CR) exposure to a central government or central bank;

(c) exposures to public sector entities, which consists of any SA(CR) exposure to a public sector entity;

(c) exposures to MDBs and certain international organisations, which consists of any SA(CR) exposure to an MDB, the Bank for International Settlements, the International Monetary Fund, the European Central Bank or the European Community;

(d) exposures to banking institutions, which consists of any SA(CR) exposure to a banking institution;

(f) exposures to corporates, which consists of any SA(CR) exposure to any corporation, partnership, sole proprietorship or trust, other than exposures categorised as exposures to public sector entities, exposures to MDBs and certain international organisations, exposures to banking institutions, regulatory retail exposures or exposures secured by residential property;

(g) regulatory retail exposures, which consists of any SA(CR) exposure meeting the following conditions:

(i) the exposure is to an individual or individuals, or to a small business;

(ii) the exposure belongs to one of the following categories:

(A) revolving credits and lines of credit, including credit cards and overdrafts;

(B) personal term loans and leases, including instalment loans, automobile loans and leases, student and educational loans;

(C) small business credit facilities and commitments; or

(D) any other product which the Authority may specify from time to time; and

(iii) the total exposure[25] to any obligor or group of obligors[26] is not more than the lower of:

(A) 0.2% of the aggregate amount of regulatory retail exposures; and

(B) $2 million,

other than exposures categorised as exposures secured by residential property;

(h) exposures secured by residential property, which consists of any SA(CR) exposure meeting the following conditions:

(i) the exposure is to an individual or individuals, or if the exposure is to a legal person other than an individual, the Reporting Bank can demonstrate to the Authority (if required to do so) that it has robust processes to ascertain that the facility structure replicates the risk profile of an exposure to an individual or individuals and that it is able to identify and manage the legal risks that arise in such structures;

(ii) the loan is secured against a first lien mortgage, or secured against a 2nd lien mortgage if the Central Provident Fund of Singapore holds the first lien position:

(A) of a completed residential property;

(B) of an uncompleted residential property in Singapore; or

(C) of an uncompleted residential property in a jurisdiction approved by the Authority on an exceptional basis;

(iii) the loan is not past due by more than 90 days and is not rated as a classified loan under MAS Notice 612;

(iv) the loan is not to a corporation, partnership, sole proprietorship or trust engaged in residential building, development or management; and

(v) the loan-to-value ("LTV") ratio calculated in accordance with MAS Notice 632 is less than or equal to 80% ("LTV Threshold")[27]; or

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[25] For avoidance of doubt, this includes any past due exposure to the same obligor or group of obligors but does not include any SA(CR) exposure that is categorised as an exposure secured by residential property.

[26] Guideline: The basis of aggregation for a group of obligors should be the definition of an obligor group used by the Reporting Bank for its risk management purposes, with the proviso that exposures to the sole proprietors or partners in any of the entities in an obligor group that is a small business are to be included in the aggregation. However, the Reporting Bank may segregate certain exposures if the segregated obligors have independent debt-servicing ability. A simplistic segregation based on product type alone would not be acceptable.

[27] Guideline: The Reporting Bank should calculate the LTV Threshold either as at the inception of the exposure or on an ongoing-basis. A Reporting Bank should apply the chosen method consistently to its entire portfolio of SA(CR) exposures secured by residential property within a jurisdiction. A Reporting

(k) other exposures, which consists of any SA(CR) exposure that does not fall within any of the categories in sub-paragraphs (a) to (j) above.

Sub-division 2: Risk Weights

7.3.2 Subject to sub-division 3, a Reporting Bank using the SA(CR) shall:

(a) for an SA(CR) exposure that is not past due for more than 90 days, determine the applicable risk weight in accordance with paragraphs 7.3.3 to 7.3.22 below; and

(b) for an SA(CR) exposure that is past due for more than 90 days, determine the applicable risk weight in accordance with paragraphs 7.3.23 to 7.3.25 below.

Cash Items

7.3.3 Subject to paragraph 7.3.4 below, a Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure categorised as a cash item.

7.3.4 A Reporting Bank shall apply a 20% risk weight to cheques, drafts and other items drawn on other banking institutions that are payable immediately upon presentation and that are in the process of collection.

Exposures to Central Governments and Central Banks

7.3.5 Subject to paragraphs 7.3.6 and 7.3.7 below, a Reporting Bank shall risk-weight any SA(CR) exposure categorised as an exposure to central governments and central banks in accordance with Table 3-1.

Table 3-1: Risk Weights for Exposures to Central Governments and Central Banks

Credit Quality Grade	1	2	3	4	5	6	Unrated
Risk Weight	0%	20%	50%	100%	100%	150%	100%

7.3.6 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to the Government or the Authority that is denominated and funded in Singapore dollars.

7.3.7 For any SA(CR) exposure to any other central government or central bank that is denominated and funded in the local currency of that jurisdiction, a Reporting Bank may apply such risk weights as may be prescribed by the bank regulatory agency of that jurisdiction.

Bank that has chosen to calculate the LTV Threshold on an ongoing basis for SA(CR) exposures secured by residential property should not subsequently calculate the LTV Threshold as at the inception of the exposure for those SA(CR) exposures. The LTV Threshold does not apply to any SA(CR) exposure secured by residential property that is:

(a) originated by a Reporting Bank on or before 30 Jun 2004; or

(b) originated by a Reporting Bank on or before 30 Jun 2004 and refinanced by the same Reporting Bank after 30 Jun 2004, provided no additional funds are disbursed to the obligor other than funds required to discharge the obligor from its original loan and to cover associated legal and valuation costs; or

(c) refinanced by a Reporting Bank after 30 Jun 2004, provided the LTV at refinancing date or as at the inception of the original loan was not more than 80% and no additional funds are disbursed to the obligor other than funds required to discharge the obligor from its original loan and to cover associated legal and valuation costs.

Exposures to Public Sector Entities

7.3.8 Subject to paragraph 7.3.9 below, a Reporting Bank shall risk-weight any SA(CR) exposure to a public sector entity in accordance with Table 3-2.

Table 3-2: Risk Weights for Exposures to Public Sector Entities

Credit Quality Grade	1	2	3	4	5	6	Unrated
Risk Weight	20%	50%	50%	100%	100%	150%	100%

7.3.9 A Reporting Bank shall apply a 20% risk weight to any SA(CR) exposure to a public sector entity if exposures to the central government of the jurisdiction of that public sector entity have a credit quality grade of "1".

Exposures to MDBs and Certain International Organisations

7.3.10 Subject to paragraphs 7.3.11 and 7.3.12 below, a Reporting Bank shall risk-weight any SA(CR) exposure to an MDB in accordance with Table 3-3.

Table 3-3: Risk Weights for Exposures to MDBs

Credit Quality Grade	1	2	3	4	5	6	Unrated
Risk Weight	20%	50%	50%	100%	100%	150%	50%

7.3.11 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to an MDB listed in Annex 7R.

7.3.12 A Reporting Bank shall apply a 0% risk weight to any SA(CR) exposure to the Bank for International Settlements, the International Monetary Fund, the European Central Bank or the European Community.

Exposures to Banking Institutions

7.3.13 Subject to paragraphs 7.3.14 and 7.3.15 below, a Reporting Bank shall risk-weight any SA(CR) exposure to a banking institution in accordance with Table 3-4.

Table 3-4: Risk Weights for Exposures to Banking Institutions

Credit Quality Grade	1	2	3	4	5	6	Unrated
Risk Weight	20%	50%	50%	100%	100%	150%	50%
Risk Weight for Short-Term Exposures[28]	20%	20%	20%	50%	50%	150%	20%

7.3.14 The risk weight for any SA(CR) exposure to a banking institution that does not have an external credit assessment shall be the higher of the risk weight determined in accordance with Table 3-4 and the risk weight that is applicable to an SA(CR) exposure to the central government of the jurisdiction in which the banking institution is incorporated. If a short-term SA(CR) exposure to a banking institution with an issue-specific external credit assessment (see paragraph 7.3.15 below):

[28] Short-term exposures refer to exposures with an original maturity of three months or less and not expected to be rolled over.

(a) attracts a risk weight of 50% or 100%, then the Reporting Bank shall apply a risk weight of not lower than 100% to any unrated short-term SA(CR) exposure to the same banking institution; or

(b) attracts a risk weight of 150%, then the Reporting Bank shall apply a risk weight of 150% to any unrated SA(CR) exposure (whether long-term or short-term) to the same banking institution.

7.3.15 A Reporting Bank shall risk-weight any short-term SA(CR) exposure to a banking institution with an issue-specific external credit assessment in accordance with Table 3-5.

Table 3-5: Risk Weights for Short-Term Exposures to Banking Institutions with Issue-Specific External Credit Assessments

Short-Term Credit Quality Grade	I	II	III	IV
Risk Weight	20%	50%	100%	150%

Exposures to Corporates

7.3.16 Subject to paragraphs 7.3.17 to 7.3.19 below, a Reporting Bank shall risk-weight any SA(CR) exposure to a corporate in accordance with Table 3-6.

Table 3-6: Risk Weights for Exposures to Corporates

Credit Quality Grade	1	2	3	4	5	6	Unrated
Risk Weight	20%	50%	100%	100%	150%	150%	100%

7.3.17 The risk weight for any SA(CR) exposure to a corporate that does not have an external credit assessment shall be the higher of the risk weight determined in accordance with Table 3-6 and the risk weight that is applicable to an SA(CR) exposure to the central government of the jurisdiction in which the corporate is incorporated or formed.[29] If a short-term SA(CR) exposure to a corporate with an issue-specific external credit assessment (see paragraph 7.3.18 below):

(a) attracts a risk weight of 50% or 100%, then the Reporting Bank shall apply a risk weight of not lower than 100% to any unrated short-term SA(CR) exposure to the same corporate; or

(b) attracts a risk weight of 150%, then the Reporting Bank shall apply a risk weight of 150% to any unrated SA(CR) exposure (whether long-term or short-term) to the same corporate.

7.3.18 A Reporting Bank shall risk-weight any short-term SA(CR) exposure to a corporate with an issue-specific external credit assessment in accordance with Table 3-7.

Table 3-7: Risk Weights for Short-Term Exposures to Corporates with Issue-Specific External Credit Assessments

Short-Term Credit Quality Grade	I	II	III	IV
Risk Weight	20%	50%	100%	150%

[29] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures belonging to this category, taking into account, among other things, the default experience of these types of exposures.

7.3.19 Subject to the Authority's approval, a Reporting Bank may apply a 100% risk weight to its entire portfolio of SA(CR) exposures to corporates regardless of the credit quality grade of individual exposures. The Authority will not normally grant approval for a Reporting Bank to use this approach unless the Reporting Bank has a clear implementation plan for adopting the IRBA. A Reporting Bank shall not use this approach for only some of its SA(CR) exposures to corporates and determine the applicable risk weight for its other SA(CR) exposures to corporates in accordance with Tables 3-6 and 3-7.

Exposures to Regulatory Retail Portfolio

7.3.20 A Reporting Bank shall apply a 75%[30] risk weight to any SA(CR) exposure categorised as a regulatory retail exposure.

Exposures Secured by Residential Property

7.3.21 A Reporting Bank shall apply a 35%[30] risk weight to any SA(CR) exposure secured by residential property.

Other Exposures

7.3.22 A Reporting Bank shall apply a 100%[30] risk weight to any SA(CR) exposure categorised as other exposures.

Past Due Exposures

7.3.23 Subject to paragraphs 7.3.24 and 7.3.25, a Reporting Bank shall risk-weight the unsecured portion of any SA(CR) exposure that is past due for more than 90 days in accordance with Table 3-8.

Table 3-8: Risk Weights for Past Due Exposures

Condition	**Risk Weight**
When specific provisions are less than 20% of the outstanding amount of the exposure	150%
When specific provisions are no less than 20% of the outstanding amount of the exposure	100%
When specific provisions are no less than 15% of the outstanding amount of the exposure and the exposure is fully secured by eligible CRE or eligible RRE or both	100%

[30] The Authority may from time to time specify a higher risk weight for a particular exposure or group of exposures belonging to this category, taking into account, among other things, the default experience of these types of exposures.

7.3.24 For the purposes of paragraph 7.3.23, a Reporting Bank shall calculate the unsecured portion of any SA(CR) exposure using the following formula:

(a) for a Reporting Bank using the FC(SA),

Unsecured Portion = E – P – C ,

where

E = E calculated in accordance with Division 2

P = notional amount of eligible credit protection received

C = latest fair market value of the eligible collateral received[31]; or

(b) for a Reporting Bank using the FC(CA),

Unsecured Portion = E* - P ,

where

E* = E* calculated in accordance with Division 2

P = notional amount of eligible credit protection received

7.3.25 A Reporting Bank shall apply a 100% risk weight to any SA(CR) exposure that meet all the conditions in paragraph 7.3.1(g) for categorisation as an exposure secured by residential property except that it is past due for more than 90 days.

Sub-division 3: Treatment of Credit Protection and Recognition of Eligible Financial Collateral

Treatment of Eligible Credit Protection Bought

7.3.26 A Reporting Bank that has eligible credit protection for an SA(CR) exposure may recognise the credit risk mitigation effects of the eligible credit protection[32] as follows:

(a) divide the SA(CR) exposure into:

(i) a protected portion with E equal to the notional amount of the eligible credit protection[33]; and

(ii) an unprotected portion with E equal to the E of the SA(CR) exposure less the notional amount of the eligible credit protection; and

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[31] For the purposes of this sub-paragraph, eligible collateral refers to eligible financial collateral and, for a transitional period of 3 years starting from the effective date of this Notice, eligible CRE and eligible RRE. For avoidance of doubt, the Reporting Bank shall risk weight the portion secured by eligible collateral, C, in accordance with the applicable risk weight(s) for the type(s) of eligible collateral received.

[32] A Reporting Bank shall not recognise the effect of eligible credit protection if such credit protection is already reflected in the issue-specific external credit assessment of the SA(CR) exposure.

[33] Where there is a maturity mismatch, a Reporting Bank shall determine the maturity-adjusted value of the protected portion in accordance with Annex 7G.

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to sub-division 3 of Division 1, use:

  (i) for the protected portion, the risk weight that is applicable to the eligible protection provider; and

  (ii) for the unprotected portion, the risk weight that is applicable to the underlying obligor,

provided the Reporting Bank observes Annex 7E.

7.3.27 In cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover, basket credit derivatives and currency mismatches, a Reporting Bank may recognise the credit risk mitigation effects of the eligible credit protection by applying the relevant provisions in Annex 7S, provided the Reporting Bank observes Annex 7E.

Treatment of Credit Protection Sold

7.3.28 A Reporting Bank that has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an SA(CR) exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure using the risk weight that is applicable to the obligor of the reference asset.

7.3.29 Subject to paragraph 7.3.30, if the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated using the risk weights that are applicable to the obligors of the respective reference assets. The Authority may, at its discretion, waive the additive rule on a case-by-case basis if it can be demonstrated to the Authority's satisfaction that there is sufficiently strong correlation between two or more reference assets. The capital requirement for the credit protection shall not exceed the nominal amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.3.30 If the unfunded credit protection is an nth-to-default credit derivative and it is not a securitisation exposure as defined in Division 6 of this Part, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection in accordance with paragraph 7.3.29 above, except that it may exclude from the calculation the credit risk-weighted exposure amounts relating to the n-1 reference asset(s) with the lowest credit risk-weighted exposure amount(s).

7.3.31 A Reporting Bank that has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. If such exposures are SA(CR) exposures, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of:

(a) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraphs 7.3.28 to 7.3.30 above, as applicable; and

(b) the credit risk-weighted exposure amount for the exposure to the protection buyer, using:

  (i) E = the carrying value of the collateral placed with the protection buyer; and

(ii) the risk weight that is applicable to the protection buyer, unless the protection buyer is an SPE, in which case the risk weight that is applicable to the collateral owned by the SPE shall be used.

7.3.32 The capital requirement for the credit protection calculated in accordance with paragraph 7.3.31 shall not exceed the nominal amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.3.33 Notwithstanding paragraph 7.3.32 above, the credit risk-weighted exposure amount for funded credit protection shall be only the higher of the credit risk-weighted exposure amounts calculated under sub-paragraph 7.3.31(a) and sub-paragraph 7.3.31(b) if[34]:

(a) the reference asset has a credit quality grade of "3" or above; and

(b) the protection buyer or collateral, as the case may be, has a credit quality grade of "3" or above,

as set out in Annex 7T.

Recognition of Eligible Financial Collateral under FC(SA)

7.3.34 Subject to paragraph 7.3.35 below, a Reporting Bank that has taken eligible financial collateral[35] for an SA(CR) exposure and is using the FC(SA) may recognise the credit risk mitigation effects of the eligible financial collateral as follows:

(a) divide the SA(CR) exposure into:

(i) a collateralised portion with E equal to the latest fair market value of the eligible financial collateral; and

(ii) an uncollateralised portion with E equal to the E of the SA(CR) exposure less the latest fair market value of the eligible financial collateral; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to sub-division 3 of Division 1, use:

(i) for the collateralised portion, the risk weight that is applicable to the eligible financial collateral as though the Reporting Bank had a direct exposure to that collateral; and

(ii) for the uncollateralised portion, the risk weight that is applicable to the obligor,

provided the Reporting Bank observes Annex 7E.

[34] For avoidance of doubt, this paragraph shall not apply if either the reference asset or the protection buyer or collateral, as the case may be, has a credit quality grade that is below "3", as set out in Annex 7T.

[35] Where there is a currency mismatch, the Reporting Bank shall record the amount of eligible financial collateral subject to a currency mismatch as a long foreign exchange position in the currency of the eligible financial collateral for the purposes of calculating Market RWA pursuant to Part VIII.

7.3.35 If the risk weight determined in accordance with paragraph 7.3.34(b)(i) above is less than 20%, a Reporting Bank shall apply a risk weight of 20% to the collateralised portion of the SA(CR) exposure, except in the following cases:

(a) any qualifying SFT that meets the conditions of Annex 7Q and the counterparty in the transaction is a core market participant, in which case the Reporting Bank may apply a risk weight of 0%;

(b) a qualifying SFT that meets the conditions of Annex 7Q and the counterparty in the transaction is not a core market participant, in which case the Reporting Bank may apply a risk weight of 10%;

(c) an OTC derivative transaction subject to daily mark-to-market that is collateralised by cash, and where there is no currency mismatch, in which case the Reporting Bank may apply a risk weight of 0%;

(d) an OTC derivative transaction subject to daily mark-to-market that is collateralised by exposures to central governments, central banks or public sector entities or a combination thereof qualifying for a 0% risk weight under the SA(CR), and where there is no currency mismatch, in which case the Reporting Bank may apply a risk weight of 10%;

(e) a transaction where there is no currency mismatch and the collateral is:

(i) cash on deposit as defined in Annex 7E; or

(ii) exposures to central governments, central banks or public sector entities or a combination thereof qualifying for a 0% risk weight under the SA(CR), and the latest fair market value of such collateral has been discounted by 20% for the purposes of determining the value of the collateralised portion of the SA(CR) exposure in accordance with paragraph 7.3.34(a)(i) above,

in which case the Reporting Bank may apply a risk weight of 0%.

Treatment of Pools of Credit Risk Mitigation Techniques

7.3.36 A Reporting Bank that is using multiple credit risk mitigation techniques to cover a single SA(CR) exposure (e.g. the Reporting Bank has both eligible financial collateral and eligible credit protection partially covering the exposure) shall sub-divide the exposure into portions covered by each type of credit risk mitigation technique (e.g. a portion covered by eligible financial collateral and a portion covered by eligible credit protection) and calculate the credit risk-weighted exposure amount of each portion separately by applying paragraphs 7.3.26, 7.3.27, 7.3.34 and 7.3.35, whichever is applicable. A Reporting Bank shall apply the same approach when recognising eligible credit protection by a single protection provider with differing maturities.

Sub-Division 4: Credit Quality Grade and External Credit Assessments

7.3.37 A Reporting Bank shall assign an SA(CR) exposure to a credit quality grade based on the external credit assessment that is applicable to the SA(CR) exposure in accordance with Annex 7T.

7.3.38 A Reporting Bank shall use only the external credit assessments by eligible ECAIs set out in Annex 7T. A Reporting Bank should consult the Authority if the ECAI whose external credit assessments it intends to use is not in Annex 7T.

7.3.39 A Reporting Bank shall use its chosen eligible ECAIs and their external credit assessments consistently for each type of exposures, for both risk weighting and risk management purposes. Where a Reporting Bank has two external credit assessments which map into different credit quality grades, it shall assign the SA(CR) exposure to the credit quality grade associated with the higher risk weight. Where a Reporting Bank has three or more external credit assessments which map into two or more different credit quality grades, it shall assign the SA(CR) exposure to the credit quality grade associated with the higher of the lowest two risk weights.[36]

7.3.40 Where an SA(CR) exposure has an issue-specific external credit assessment, a Reporting Bank shall use such issue-specific assessment.

7.3.41 Where an SA(CR) exposure does not have an issue-specific external credit assessment, a Reporting Bank may:

(a) if there is an issue-specific external credit assessment for another exposure to the same obligor, use the issue-specific assessment for the other exposure only if the exposure without an issue-specific assessment ranks *pari passu* or senior to the exposure with the issue-specific assessment; or

(b) if the obligor has an issuer external credit assessment, use the issuer assessment of the obligor only if the exposure without an issue specific assessment ranks *pari passu* or senior to any senior unsecured claim on the obligor.

In all other cases, the Reporting Bank shall apply a risk weight equal to the higher of the risk weight that is applicable to an unrated exposure and the risk weight associated with the external credit assessment, if any, of the obligor or another exposure to the same obligor.

7.3.42 Where an SA(CR) exposure is risk-weighted in accordance with paragraphs 7.3.41(a) or (b) above, a Reporting Bank may use a domestic currency external credit assessment only if the SA(CR) exposure is denominated in domestic currency.

7.3.43 A Reporting Bank may use an external credit assessment to risk weight an SA(CR) exposure only if the external credit assessment has taken into account and reflects the entire amount of credit risk exposure the Reporting Bank has with regard to all payments owed to it.[37]

7.3.44 A Reporting Bank shall not use unsolicited external credit assessments to assign any SA(CR) exposure to a credit quality grade.

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[36] Guideline: For illustration, if there are three external credit assessments mapping into credit quality grades with risk weights of 0%, 20% and 50%, then the applicable risk weight is 20%. If the external credit assessments map into credit quality grades with risk weights of 20%, 50% and 50%, then the applicable risk weight is 50%.

[37] Guideline: For example, if a Reporting Bank is owed both principal and interest, the assessment should fully take into account and reflect the credit risk associated with repayment of both principal and interest.

Sub-division 5: Eligible ECAIs

Note: The Authority will consult on the procedures for recognition of eligible ECAIs at a later date.

Division 4: IRBA

Sub-division 1: Application to Adopt the IRBA

7.4.1 A Reporting Bank shall seek permission from the Authority in writing to adopt the IRBA:

(a) if the Reporting Bank is adopting the F-IRBA, no less than 18 months prior to its IRBA adoption date;

(b) if the Reporting Bank is adopting the IRBA for the IRBA retail asset class, no less than 18 months prior to its IRBA adoption date; and

(c) if the Reporting Bank is adopting the A-IRBA, no less than 30 months prior to its IRBA adoption date or such other shorter time as may be permitted by the Authority after taking into account the IRBA rollout plan of the Reporting Bank.

7.4.2 The application pursuant to paragraph 7.4.1 above shall contain the following:

(a) a written confirmation from the executive officer responsible for risk management in the Reporting Bank that:

(iii) the use of rating systems and:

(A) in the case of IRBA exposures for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amounts, internal estimates of PD; and

(B) in the case of IRBA exposures for which the Reporting Bank is using the IRBA for the IRBA retail asset class or A-IRBA to calculate the credit risk-weighted exposure amounts, internal estimates of PD, LGD and EAD,

forms an integral part of the systems and processes of the Reporting Bank for managing credit risk;

(ii) the Reporting Bank has a process for managing the potential variability of its Credit RWA over an economic cycle[38] to help ensure ongoing compliance with the minimum capital requirements specified in this Notice and bank-specific capital requirements required by the Authority pursuant to section 10(3) of the Banking Act. The Reporting Bank should have carefully

[38] This is particularly if the credit assessments of the Reporting Bank are likely to change significantly over an economic cycle.

considered the implications of its IRB systems on credit risk assessment and capital management. If the Reporting Bank uses IRB systems that would result in changes in its assessment of credit risk over an economic cycle, its process for capital management should be designed to address potential capital shortfalls in economic downturns;

(iii) the Reporting Bank has a process for continually determining the suitability of its credit risk management strategy and framework as well as IRB systems, taking into account such regulations, Notices and guidelines that the Authority may issue from time to time, including Annex 7U[39];

(iv) the Reporting Bank has systems, processes and controls to calculate Credit RWA under the IRBA accurately and that those systems, processes and controls are subject to internal audit at least on an annual basis;

(v) the Reporting Bank has a process to calculate the credit risk-weighted exposure amount for any IRBA exposure using the SA(CR) within a reasonable timeframe if required by the Authority; and

(vi) the IRBA rollout plan of the Reporting Bank is in accordance with Annex 7V[40];

(b) a written confirmation from the executive officer responsible for internal audit of the Reporting Bank that:

(i) he does not disagree with the confirmation by the executive officer responsible for risk management pursuant to sub-paragraph (iii) above; and

(ii) the Reporting Bank has conducted an internal validation of all systems, processes and controls necessary for adopting IRBA[41]; and

(c) a report on the latest internal validation conducted by the Reporting Bank prior to the application pursuant to paragraph 7.4.1 and relevant supporting documentation of the IRB systems of the Reporting Bank.

Sub-division 2: Recognised Parallel Run

7.4.3 A Reporting Bank intending to adopt the IRBA shall conduct a parallel run recognised by the Authority prior to its IRBA adoption date.

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39 Annex 7U sets out the expectations of the Authority for a Reporting Bank adopting the IRBA.

40 Unless the Reporting Bank demonstrates to the Authority that it faces exigencies that are material and relevant.

41 Guideline: In areas where a Reporting Bank does not fully meet the Authority's expectations, it should conduct self-assessments to identify the key shortcomings and develop comprehensive action plans to address them before supervisory validation begins. Such action plans should include identifying the personnel responsible for specific actions, resource needs and a schedule for completion.

7.4.4 The Authority would not normally recognise a parallel run unless it is based on IRB systems examined by the Authority and the systems are found sufficiently satisfactory by the Authority for the parallel run.[42] The Authority may grant permission for a Reporting Bank to commence a recognised parallel run subject to any conditions or restrictions that the Authority may apply.

7.4.5 A Reporting Bank intending to adopt the F-IRBA or the IRBA for the IRBA retail asset class shall conduct a recognised parallel run for at least one year prior to its IRBA adoption date. A Reporting Bank intending to adopt the A-IRBA shall conduct a recognised parallel run for at least two years prior to its IRBA adoption date or such other shorter period as the Authority may allow.

7.4.6 During the recognised parallel run, the Reporting Bank shall calculate its Tier 1 CAR and Total CAR using both the IRBA and the prevailing capital requirements that are applicable to the Reporting Bank (whether under MAS Notice 637 dated 28 May 2004 or under this Notice).

7.4.7 A Reporting Bank shall submit to the Authority the Tier 1 CAR and Total CAR calculations under paragraph 7.4.6:

(a) at the Solo level as at the end of each month during the recognised parallel run, no later than the 30th of the following month; and

(b) at the Group level as at the end of each quarter during the recognised parallel run, no later than the 30th of the following month.

7.4.8 If a Reporting Bank becomes aware during the recognised parallel run that the confirmations made pursuant to paragraphs 7.4.2(a) and 7.4.2(b) above are no longer valid or that it is not in complete compliance with all the conditions or restrictions imposed by the Authority pursuant to paragraph 7.4.4 above for the Reporting Bank to commence a recognised parallel run, the Reporting Bank shall:

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action in accordance with the plan prepared pursuant to sub-paragraph (c) above.

Sub-division 3: Supervisory Permission to Adopt the IRBA

[42] Guideline: Where there are outstanding issues, the Reporting Bank should satisfy the Authority that it would be able to address them within a reasonable time so that the results of the parallel run would remain meaningful.

7.4.9 During the recognised parallel run, the Authority will continue to evaluate the readiness of the Reporting Bank to adopt the IRBA in order to reach a decision towards the end of the recognised parallel run, whether to grant or withhold supervisory permission for the Reporting Bank to adopt the IRBA. The Authority may withhold such permission if, during the recognised parallel run, it becomes aware of information that materially affects its assessment of the readiness of the Reporting Bank to adopt the IRBA or if any outstanding issue identified prior to the start of the recognised parallel run has not been addressed. The Authority may also require the Reporting Bank to extend the parallel run to allow more time for the Reporting Bank to take corrective actions.

7.4.10 The Authority may grant permission for a Reporting Bank to adopt the IRBA subject to any conditions or restrictions that the Authority may apply.

7.4.11 If a Reporting Bank becomes aware after adopting the IRBA that the confirmations made pursuant to paragraphs 7.4.2(a) and 7.4.2(b) above are no longer valid or that it is not in complete compliance with all the conditions or restrictions imposed by the Authority pursuant to paragraph 7.4.10 above for the Reporting Bank to adopt the IRBA, it shall:

(a) inform the Authority as soon as practicable;

(b) assess the effect of the situation in terms of the risk posed to the Reporting Bank;

(c) prepare a plan to rectify the situation and inform the Authority of its plan as soon as practicable; and

(d) undertake prompt corrective action in accordance with the plan prepared pursuant to sub-paragraph (c) above.

7.4.12 If a Reporting Bank fails to comply with paragraph 7.4.11, the Authority may revoke its supervisory permission for the Reporting Bank to adopt the IRBA. The Reporting Bank may also be subjected to higher bank-specific capital requirements or other actions by the Authority pursuant to Section 10(3) of the Banking Act.

7.4.13 The Authority may revoke its supervisory permission for a Reporting Bank to adopt IRBA if:

(a) the Authority subsequently becomes aware that the Reporting Bank has furnished information to the Authority in connection with its application for supervisory permission to adopt IRBA that is materially false or misleading;

(b) the Reporting Bank has not executed its IRBA rollout in accordance with the rollout parameters in Annex 7V;

(c) the Reporting Bank has not fulfilled the conditions and restrictions imposed by the Authority pursuant to paragraph 7.4.10 above in connection with its supervisory permission for the Reporting Bank to adopt the IRBA;

(d) the Authority is not satisfied that the risk assessment and management systems, controls and practices of the Reporting Bank are adequate to support the IRBA; or

(d) the Reporting Bank has not undertaken corrective actions to address sub-paragraphs 0, 0 and 0 above within a reasonable time.

Sub-division 4: Categorisation of IRBA Exposures

(This sub-division sets out guidelines for the categorisation of exposures under the IRBA. The Authority will take into account the observance of these guidelines by a Reporting Bank in assessing whether the Reporting Bank has complied with section 10(2) of the Banking Act.)

7.4.14 A Reporting Bank should categorise any IRBA exposure that is not classified as in default in accordance with the definition of default in Annex 7W into an asset sub-class belonging to the IRBA wholesale asset class, the IRBA retail asset class or the IRBA eligible purchased receivables asset class[43] as defined under paragraphs 7.4.15 to 7.4.18 below. A Reporting Bank should treat any exposure that does not fall within any of the IRBA wholesale asset class, the IRBA retail asset class or the IRBA eligible purchased receivables asset class as an SA(CR) exposure in accordance with Division 3 of this Part.

7.4.15 The IRBA wholesale asset class consists of the following asset sub-classes:

(a) corporate asset sub-class, which consists of:

(i) any IRBA exposure to a corporation, partnership, sole proprietorship or trust other than exposures belonging to the corporate small business asset sub-class, bank asset sub-class, SL asset sub-class, HVCRE asset sub-class, purchased corporate receivables asset sub-class or purchased corporate small business receivables asset sub-class; and

(ii) any IRBA exposure to an individual, which would otherwise fall within the IRBA retail asset class, if the Reporting Bank has clear reasons for categorising such exposure under the corporate asset sub-class and such categorisation is consistent with the policies of the Reporting Bank for categorisation of exposures;

(b) corporate small business asset sub-class, which consists of any IRBA exposure to a corporation, partnership, sole proprietorship or trust with reported annual sales of less than $100 million, other than exposures belonging to the bank asset sub-class, SL asset sub-class, HVCRE asset sub-class or purchased corporate small business receivables asset sub-class. For the purposes of determining whether the $100 million reported annual sales threshold is met, the Reporting Bank should:

(i) if the corporation, partnership, sole proprietorship or trust is part of a group of companies as defined in section 209A of the

[43] Guideline: The categorisation of exposures into various asset sub-classes as set out in this sub-division is intended to be consistent with established industry practice. However, the Authority recognises that a Reporting Bank may use different definitions and methodology for purposes of internal reporting and risk measurement. While it is not the intention of the Authority to require Reporting Banks to change the way in which they manage their businesses and risks, Reporting Banks should apply the stipulated treatment to each of their exposures for the purposes of deriving their minimum capital adequacy requirements for consistency across Reporting Banks. The Authority may grant permission in writing for a Reporting Bank to use its methodology for assigning exposures to different asset sub-classes, if it is satisfied that the definitions and methodology used by the Reporting Bank for assigning exposures to different asset sub-classes are appropriate and will result in broadly consistent categorisations. A Reporting Bank that has received such written permission from the Authority may be required by the Authority to re-categorise any exposure or class of exposures into asset sub-classes as set out in this sub-division if the Authority deems that the definitions and methodology used by the Reporting Bank for assigning exposures to different asset sub-classes are no longer appropriate or may not result in broadly consistent categorisations.

Companies Act, use the reported annual consolidated sales of the group of companies;

(ii) have in place rigorous information gathering and timely updating processes to help ensure that the reported annual sales figure used is timely and relevant. The reported annual sales figure used shall be audited and taken from the most recent full-year financial statements, which should be for a financial period ending not more than 18 months before the time when the credit risk-weighted exposure amount for that IRBA exposure is calculated[44]; and

(iii) satisfy itself that there has been no events after the date of the financial statements referred to in sub-paragraph (ii) above that would reasonably cause the $100 million reported annual sales threshold to be breached;

(c) sovereign asset sub-class, which consists of any IRBA exposure to a central government, central bank or MDB listed in Annex 7R;

(d) bank asset sub-class, which consists of any IRBA exposure to a banking institution, public sector entity or MDB not listed in Annex 7R;

(e) SL asset sub-class, which consists of any IRBA exposure that meet the characteristics set out in Annex 7A, but excluding exposures that also belong to the HVCRE asset sub-class; and

(f) HVCRE asset sub-class, which consists of exposures that meet the characteristics set out in Annex 7A.

7.4.16 The IRBA retail asset class[45] consists of the following asset sub-classes:

(a) residential mortgages asset sub-class, which consists of any IRBA exposure, other than exposures belonging to the purchased retail receivables asset sub-class, that meets the following conditions:

(i) the loan is extended to an individual or individuals, or if the loan is extended to a legal person other than an individual, the Reporting Bank can demonstrate to the Authority (if required to do so) that it has robust processes to ascertain that the facility structure replicates the risk profile of an exposure to an individual or individuals and that it is able to identify and manage the legal risks that arise in such structures;

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44 Guideline: For example, the sales figure for the 12 months ending 31 Dec 2002 may not be used for calculating credit risk-weighted exposure amounts after 30 Jun 2004. Audited figures that are not more than 24 months old may be admissible under exceptional circumstances.

45 Guideline: The purpose of the definition of IRBA retail asset class is to separate a portfolio from other business so that a separate capital formula may be applied to the retail portfolio. Where exposures in the IRBA retail asset class are assigned to pools, it is the statistical characteristics of these pools which are used to derive the estimates of IRBA parameters. Therefore, pools should be reasonably homogenous and subject to consistent risk management practices. A Reporting Bank should have sufficient controls to help ensure that any inadvertent assignment of non-eligible exposures to the IRBA retail asset class would be sufficiently immaterial that it would not result in any significant distortion of the overall statistical characteristics of the pools. Cost considerations do not justify inclusion of non-eligible exposures if the effect on the statistical characteristics of the pools would be material. Sample testing could be one method of demonstrating that such impact would be immaterial.

(ii) the loan is managed by the Reporting Bank as part of a pool of similar loans;

(iii) the loan is secured against a first lien mortgage, or secured against a 2nd lien mortgage if the Central Provident Fund of Singapore holds the first lien position:

(A) of a completed residential property;
(B) of an uncompleted residential property in Singapore; or
(C) of an uncompleted residential property in a jurisdiction approved by the Authority on an exceptional basis;

(iv) the loan is not past due by more than 90 days and is not rated as a classified loan under MAS Notice 612; and

(v) the loan is not to a corporation, partnership, sole proprietorship or trust engaged in residential building, development or management;

(b) qualifying revolving retail exposures ("QRRE") asset sub-class, which consists of any IRBA exposure, other than exposures belonging to the purchased retail receivables asset sub-class, that meets the following conditions[46]:

(i) the exposure is to an individual;

(ii) the exposure is managed by the Reporting Bank as part of a pool of similar exposures;

(iii) the exposure is revolving, unsecured, and uncommitted both contractually and in practice. In this context, a revolving exposure is defined as one where the customer's outstanding balance is permitted to fluctuate based on his decisions to borrow and repay, up to a limit established by the Reporting Bank;

(iv) the exposure, together with other exposures[47] in the QRRE asset sub-class to the same individual, is not more than $200,000;

(v) the exposures categorised under this asset sub-class, taken in aggregate as well as on an individual segment basis, exhibit a volatility of loss rates that is lower than the average volatility of loss rates for the other retail exposures asset sub-class;

(vi) the Reporting Bank retains data on the volatility of loss rates for purposes of analysis of loss volatilities; and

(vii) the Reporting Bank has received supervisory permission from the Authority[48] on its categorisation of the exposure within the QRRE asset sub-class; and

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[46] Guideline: These conditions need to be met for all exposures in any sub-portfolio categorised under the QRRE asset sub-class at the country or self-administrative jurisdiction level.
[47] For avoidance of doubt, this includes any exposure in the QRRE asset sub-class to the same individual that is classified as in default in accordance with the definition of default in Annex 7Q.
[48] Guideline: In granting supervisory permission, the Authority would normally assess the approach of the Reporting Bank for categorising exposures under the QRRE asset sub-class.

(c) other retail exposures asset sub-class, which consists of any IRBA exposure, other than exposures belonging to the residential mortgages asset sub-class, QRRE asset sub-class or purchased retail receivables asset sub-class, that meets the following conditions:

(i) the exposure is to an individual and the exposure is managed as part of a pool of similar exposures[49]; or

(ii) the exposure is to a small business and:

(A) the total exposure[50] of the Reporting Bank to the small business (on a consolidated basis[51] where applicable) is not more than $2 million.[52] For the purposes of determining whether the $2 million threshold is met, the Reporting Bank should aggregate exposures to the same small business, even if they are extended through or guaranteed by an individual; and

(B) the exposure qualifies as a small business exposure within the documented policy of the Reporting Bank on the types of exposures, and is managed by the Reporting Bank as part of a pool of similar exposures consistently over time and in the same manner as other exposures categorised under the IRBA retail asset sub-class. This means that the exposure is originated in a similar manner to other exposures categorised under the IRBA retail asset class, and is not managed individually in a way comparable to exposures categorised under the corporate asset sub-class, but rather as part of a segment or pool of exposures with similar risk characteristics for purposes of risk assessment and quantification.

7.4.17 For purposes of paragraph 7.4.16(c)(ii)(B) above, an exposure to a small business will not normally be considered to be individually managed in a way comparable to exposures categorised under the corporate asset sub-class if individual management of that exposure:

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49 Guideline: By way of example, exposures such as revolving credits and lines of credit (e.g. credit cards, overdrafts, and retail facilities secured by financial instruments) as well as personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance, and other exposures with similar characteristics) are eligible for retail treatment. The Authority expects Reporting Banks to establish rigorous internal policies on ensuring the granularity and homogeneity of their retail pools.

50 For avoidance of doubt, this includes any exposure to the same small business that is classified as in default in accordance with the definition of default in Annex 7Q.

51 Guideline: The basis of consolidation for small business exposures not more than $2 million that are treated as retail exposures will be the definition of an obligor group used by the Reporting Bank for its risk management purposes, with the proviso that exposures to the sole proprietors or partners in any of the entities in the obligor group are to be included in the consolidation. However, the Reporting Bank may de-consolidate certain exposures if the de-consolidated obligors have independent debt-servicing ability. A simplistic de-consolidation based on product type alone would not be acceptable.

52 Guideline: When an IRBA exposure categorised under the other retail exposures asset sub-class pursuant to this provision exceeds the $2 million threshold, a Reporting Bank should re-categorise the exposure under the corporate asset sub-class or corporate small business asset sub-class. The Authority will be flexible if the need for re- categorisation arises solely from short-term exchange rate fluctuations, e.g. exchange rate fluctuations of non-Singapore dollar-denominated assets. In such cases, the Authority would expect the Reporting Bank to establish appropriate policies and processes to determine when the threshold is exceeded in a more permanent way, e.g. through the extension of increased credit or a major currency revaluation, and to re-categorise the exposures if necessary.

(a) is sufficiently insignificant so as not to disrupt the homogeneity of the pool;

(b) is consistent with the management of other exposures in the same pool; and

(c) is significantly different in extent from the individual management that occurs for exposures categorised under the corporate asset sub-class, looked at as a whole.

7.4.18 The IRBA eligible purchased receivables asset class consists of the following asset sub-classes:

(a) purchased corporate receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the corporate asset sub-class;

(b) purchased corporate small business receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the corporate small business asset sub-class; and

(c) purchased retail receivables asset sub-class, which consists of purchased receivables that meet the criteria for categorisation under the IRBA retail asset class.

Sub-division 5: Calculation of Capital Requirements, K, under the IRBA

7.4.19 A Reporting Bank using the IRBA shall:

(a) for an IRBA exposure not classified as in default in accordance with the definition of default in Annex 7W, calculate K for that exposure in accordance with sub-divisions 7, 8, 9, and 10, whichever is applicable; and

(b) for an IRBA exposure that is classified as in default in accordance with the definition of default in Annex 7W, calculate K for that exposure in accordance with sub-division 11[53].

Sub-division 6: Calculation of Capital Requirements, K, and Determination of Risk Weights, RW_{slot}, for Exposures in the SL and HVCRE Asset Sub-Classes under the IRBA

7.4.20 For any IRBA exposure belonging to the SL asset sub-class or HVCRE asset sub-class, a Reporting Bank shall:

(a) if the Reporting Bank observes Annex 7U for deriving estimates of PD for such exposures, calculate K for that exposure in accordance with paragraph 7.4.19; and

[53] Guideline: The credit RWA under the IRBA has been calibrated to cover only the unexpected losses that could arise from a Reporting Bank's credit and investment related risks for exposures in the banking book. A Reporting Bank should consider whether it has set aside sufficient provisions to cover the expected losses that could arise from such exposures. Paragraphs 6.6(l) and 6.18(i) in Part VI provide for the appropriate deductions from Tier 1 and Upper Tier 2 capital in the event that a Reporting Bank has not set aside sufficient provisions to cover the expected losses that could arise.

(b) in all other cases, determine RW_{slot} for that exposure in accordance with the supervisory slotting criteria set out in sub-division 12.

Sub-division 7: Calculation of K for IRBA Wholesale Asset Class

Calculation of K_{corp}, K_{sov}, K_{bank} and K_{sl}

7.4.21 A Reporting Bank shall calculate K_{corp}, K_{sov}, K_{bank} and K_{sl} using the following formula:[54, 55]

Correlation (R) = 0.12 × (1 – EXP(-50 × PD)) / (1 – EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))]

Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2

Capital requirement (K_{corp}, K_{sov}, K_{bank} or K_{sl})
= [LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b)

Calculation of K_{sm}

7.4.22 A Reporting Bank shall calculate K_{sm} using the following formula:

Correlation (R) = 0.12 × (1 – EXP(-50 × PD)) / (1 - EXP(-50)) + 0.24 × [1 - (1 - EXP(-50 × PD))/(1 - EXP(-50))] – 0.04 × (1 – (S-10)/90)

Maturity adjustment (b) = (0.11852 – 0.05478 × ln(PD))^2

Capital Requirement (K_{sm})
= [LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD] x (1 - 1.5 x b)^ -1 × (1 + (M - 2.5) × b)

where S refers to total reported annual sales in millions of Singapore dollars of the obligor, or if the obligor is part of a consolidated group, of the consolidated group. Where the reported annual sales figure is less than $10 million, the Reporting Bank shall apply S = 10 for the purposes of calculating K_{sm}.

[54] Ln denotes the natural logarithm.

[55] N(x) denotes the cumulative distribution function for a standard normal random variable (i.e. the probability that a normal random variable with mean zero and variance of one is less than or equal to x). G(z) denotes the inverse cumulative distribution function for a standard normal random variable (i.e. the value of x such that N(x) = z). The normal cumulative distribution function and the inverse of the normal cumulative distribution function are, for example, available in Excel as the functions NORMSDIST and NORMSINV.

Calculation of K_{hv}

7.4.23 A Reporting Bank shall calculate K_{hv} using the following formula:

$$\text{Correlation (R)} = 0.12 \times (1 - EXP(-50 \times PD)) / (1 - EXP(-50)) + 0.30 \times [1 - (1 - EXP(-50 \times PD))/(1 - EXP(-50))]$$

$$\text{Maturity adjustment (b)} = (0.11852 - 0.05478 \times \ln(PD))^{\wedge}2$$

$$\text{Capital requirement } (K_{hv}) = [LGD \times N[(1 - R)^{\wedge}-0.5 \times G(PD) + (R/(1 - R))^{\wedge}0.5 \times G(0.999)] - PD \times LGD] \times (1 - 1.5 \times b)^{\wedge} -1 \times (1 + (M - 2.5) \times b)$$

7.4.24 Where K_{corp}, K_{sm}, K_{sov}, K_{bank}, K_{sl} or K_{hv} for any IRBA exposure calculated in accordance with paragraphs 7.4.21 to 7.4.23 above is less than 0, the Reporting Bank shall apply K = 0 for the purposes of calculating the credit risk-weighted exposure amount for that IRBA exposure pursuant to sub-division 4 of Division 1.

Probability of Default, PD

7.4.25 For the purposes of paragraphs 7.4.21 to 7.4.23 above, PD refers to the PD associated with the obligor grade to which the IRBA exposure is assigned and estimated in accordance with Annex 7U. PD is measured as a decimal.

7.4.26 For the purposes of calculating K_{corp}, K_{sm}, K_{bank}, K_{sl} and K_{hv} pursuant to paragraphs 7.4.21 to 7.4.23 above, the Reporting Bank shall apply PD = 0.03 where the PD is less than 0.03.

Loss Given Default, LGD

7.4.27 For the purposes of paragraphs 7.4.21 to 7.4.23 above, LGD refers to the LGD associated with the facility grade to which the IRBA exposure is assigned and estimated in accordance with Annex 7U, or where applicable LGD* calculated in accordance with paragraphs 7.4.29 to 7.4.33 below. LGD, or where applicable LGD*, is measured as a decimal.

7.4.28 Notwithstanding paragraph 7.4.27 above and unless otherwise provided for in this sub-division, LGD for an IRBA exposure categorised under the IRBA wholesale asset class for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amount shall be:

(a) if the exposure is expressly subordinated to another facility, 0.75; and

(b) in any other case, 0.45.

7.4.29 Where a Reporting Bank has taken eligible financial collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount, the Reporting Bank may calculate LGD*, the LGD adjusted for eligible financial collateral, as follows:

$$LGD^* = LGD \times (E^*/ EAD)$$

where:

LGD = 0.45

EAD = EAD calculated in accordance with Division 2

E* = E* calculated in accordance with Division 2

7.4.30 Where a Reporting Bank has taken eligible IRBA collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount, the Reporting Bank may recognise the credit risk mitigation effect of the eligible IRBA collateral as follows:

(a) if the ratio of the latest fair market value of the eligible IRBA collateral received (C) to the EAD calculated in accordance with Division 2 (EAD) is below the threshold C* specified in Table 4-1 for the type of eligible IRBA collateral received, the LGD adjusted for eligible IRBA collateral, LGD* = 0.45;

(b) if the ratio of C to EAD exceeds the threshold C** specified in Table 4-1 for the type of eligible IRBA collateral received, the LGD adjusted for eligible IRBA collateral, LGD* = the minimum LGD* specified in Table 4-1 for that type of eligible IRBA collateral; and

(c) if the ratio of C to EAD is equal to C* or is more than C* but less than or equal to C** for the type of eligible IRBA collateral received, divide the IRBA exposure into:

(i) a fully collateralised portion with EAD = C/C**[56], and LGD* = the minimum LGD* specified in Table 4-1 for that type of eligible IRBA collateral; and

(ii) an uncollateralised portion with EAD = EAD – C/C**[57], and LGD* = 0.45,

and calculate the credit risk-weighted exposure amount for each portion separately in accordance with sub-division 4 of Division 1.

Table 4-1: Minimum LGD* for Secured Portion of IRBA Exposures

	Minimum LGD*	Required minimum level of collateralisation (C*)	Required level of over-collateralisation for full adjustment of LGD (C**)
Eligible Receivables	0.35	0	1.25
Eligible CRE/RRE	0.35	0.30	1.40
Eligible physical collateral	0.40	0.30	1.40

[56] C** refers to the C** specified in Table 1 for that type of eligible IRBA collateral.
[57] C** refers to the C** specified in Table 1 for that type of eligible IRBA collateral.

7.4.31 A Reporting Bank shall not recognise the credit risk mitigation effects of a junior lien on an eligible CRE or eligible RRE unless:

(a) the Reporting Bank also holds all the senior liens on the eligible CRE or eligible RRE; and

(b) there is no doubt that the junior lien is legally enforceable and constitutes an efficient credit risk mitigant.

7.4.32 A Reporting Bank that recognises the credit risk mitigation effects of a junior lien on an eligible CRE or eligible RRE, taken for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which the Reporting Bank is using the F-IRBA to calculate the credit risk-weighted exposure amount, shall use the following values of C and EAD for the purposes of calculating LGD* in accordance with paragraph 7.4.30 above:

(a) C = sum of all the junior and senior liens held by the Reporting Bank on the eligible CRE or eligible RRE;

(b) EAD = sum of all the exposures secured by all the junior and senior liens held by the Reporting Bank on the eligible CRE or eligible RRE.

7.4.33 Where a Reporting Bank has taken different types of eligible IRBA collateral or a mix of eligible financial collateral and eligible IRBA collateral for an IRBA exposure (other than an exposure that is expressly subordinated to another facility) categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount, the Reporting Bank may recognise the credit risk mitigation effects of the eligible IRBA collateral, and where applicable eligible financial collateral, as follows:

(a) calculate E* in accordance with Division 2;

(b) divide the IRBA exposure into:

(i) a portion collateralised by eligible financial collateral with EAD = EAD – E* [58], and LGD* = 0;

(ii) a portion collateralised by eligible receivables with EAD = $C_{er}/1.25$[59], and LGD* = 0.35;

(iii) a portion collateralised by eligible CRE and/or eligible RRE with EAD = $C_{ecr}/1.4$[60], and LGD* = 0.35[61];

(iv) a portion collateralized by eligible physical collateral with EAD = $C_{ep}/1.4$[62], and LGD* = 0.40[59]; and

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58 E* refers to the E* calculated in paragraph 7.4.33(a).

59 C_{er} refers to the latest fair market value of the eligible receivables.

60 C_{ecr} refers to the latest fair market value of the eligible CRE and/or eligible RRE.

61 A Reporting Bank may apply the minimum LGDs of 0.35 for eligible CRE and eligible RRE and 0.40 for eligible physical collateral only if $(C_{ecr} + C_{ep})/[EAD - (EAD - E^*) - C_{er}/1.25] \geq 0.30$. In all other cases, the applicable LGD is 0.45.

62 C_{ep} refers to the latest fair market value of the eligible physical collateral.

(v) an uncollateralised portion with EAD = EAD – (EAD - E*) – C_{er}/1.25 – C_{ecr}/1.4 – C_{ep}/1.4, and LGD* = 0.45; and

(c) calculate the credit risk-weighted exposure amount for each portion in sub-paragraph (b) above separately in accordance with sub-division 4 of Division 1.

Effective Maturity, M

7.4.34 M shall be calculated in accordance with Annex 7X.

Sub-division 8: Calculation of K for IRBA Retail Asset Class

Calculation of K_{mort}

7.4.35 A Reporting Bank shall calculate K_{mort} using the following formula[63]:

Correlation (R) = 0.15

Capital requirement (K_{mort})
= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD

Calculation of K_{qrre}

7.4.36 A Reporting Bank shall calculate K_{qrre} using the following formula:

Correlation (R) = 0.04

Capital requirement (K_{qrre})
= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD

Calculation of K_{oret}

7.4.37 A Reporting Bank shall calculate K_{oret} using the following formula:

Correlation (R) = 0.03 × (1 - EXP(-35 × PD)) / (1 - EXP(-35)) + 0.16 × [1 - (1 - EXP(-35 × PD))/(1 - EXP(-35))]

Capital requirement (K_{oret})
= LGD × N[(1 - R)^-0.5 × G(PD) + (R/(1 - R))^0.5 × G(0.999)] – PD x LGD

Probability of Default, PD

7.4.38 For the purposes of paragraphs 7.4.35 to 7.4.37 above, PD refers to the PD associated with the segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7U. PD is measured as a decimal.

7.4.39 For the purposes of calculating K_{mort}, K_{qrre} and K_{oret} pursuant to paragraphs 7.4.35 to 7.4.37 above, the Reporting Bank shall apply PD = 0.03 where the PD is less than 0.03.

Loss Given Default, LGD

7.4.40 For the purposes of paragraphs 7.4.35 to 7.4.37 above, LGD refers to the LGD associated with the segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7U. LGD is measured as a decimal.

Sub-division 9: Calculation of K for Eligible Purchased Receivables Asset Class

7.4.41 A Reporting Bank shall calculate K_{cp} using the following formula:

$$K_{cp} = [K_{df,\ cp} + K_{dil,\ cp}]$$

where $K_{df,\ cp}$ refers to the capital requirement for the default risk of purchased corporate receivables and $K_{dil,\ cp}$ refers to the capital requirement for the dilution risk[64] of purchased corporate receivables. A Reporting Bank need not calculate $K_{dil,\ cp}$ if the Reporting Bank demonstrates to the Authority's satisfaction that dilution risk is immaterial.

7.4.42 A Reporting Bank shall calculate K_{sp} using the following formula:

$$K_{sp} = [K_{df,\ sp} + K_{dil,\ sp}]$$

where $K_{df,\ sp}$ refers to the capital requirement for the default risk of purchased corporate small business receivables and $K_{dil,\ sp}$ refers to the capital requirement for the dilution risk of purchased corporate small business receivables. A Reporting Bank need not calculate $K_{dil,\ sp}$ if the Reporting Bank demonstrates to the Authority's satisfaction that dilution risk is immaterial.

[64] In addition to default risk, a purchased receivable is also exposed to dilution risk which refers to the possibility that the receivable amount is reduced through cash or non-cash credits to the obligor of the receivable. Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the borrower to an obligor of the receivables, and any payment or promotional discounts offered by the borrower (e.g. a credit for cash payments within 30 days).

7.4.43 A Reporting Bank shall calculate K_{rp} using the following formula:

$$K_{rp} = [K_{df,\ rp} + K_{dil,\ rp}]$$

where $K_{df,\ rp}$ refers to the capital requirement for the default risk of purchased retail receivables and $K_{dil,\ rp}$ refers to the capital requirement for the dilution risk of purchased retail receivables. A Reporting Bank need not calculate $K_{dil,\ rp}$ if the Reporting Bank demonstrates to the Authority's satisfaction that dilution risk is immaterial.

Calculation of Capital Requirements for Default Risk, K_{df}

7.4.44 Subject to paragraph 7.4.45, a Reporting Bank shall calculate[65]:-

(a) $K_{df,\ cp}$ by applying the formula set out in paragraph 7.4.21, subject to the Reporting Bank receiving supervisory permission to adopt the IRBA for the corporate asset sub-class;

(b) $K_{df,\ sp}$ by applying the formula set out in paragraph 7.4.22, subject to the Reporting Bank receiving supervisory permission to adopt the IRBA for the corporate small business asset sub-class; and

(c) $K_{df,\ rp}$ by applying the formula[66] set out in paragraph 7.4.35, 7.4.36 or 7.4.37 (depending on whether the purchased receivables meet the criteria for categorisation under the residential mortgage asset sub-class, QRRE asset sub-class or other retail exposures asset sub-class), subject to the Reporting Bank receiving supervisory permission to adopt the IRBA for the applicable retail asset sub-class. If the purchased receivables meet the criteria for categorisation under the residential mortgage asset sub-class or QRRE asset sub-class but the Reporting Bank has not received supervisory permission to adopt the IRBA for those asset sub-classes, the Reporting Bank shall calculate $K_{df,\ rp}$ by applying the formula set out in paragraph 7.4.37, subject to the Reporting Bank receiving supervisory permission to adopt the IRBA for the other retail exposures asset sub-class.

7.4.45 Subject to approval by the Authority, a Reporting Bank may calculate $K_{df,\ cp}$ and $K_{df,\ sp}$ using a top-down approach as set out in Annex 7Y. The top-down approach allows derivation of estimates of IRBA parameters on a pooled basis. A Reporting Bank seeking approval from the Authority to use the top-down approach shall satisfy the following conditions:-

(a) the receivables are purchased from unrelated, third party sellers, and as such the Reporting Bank has not originated the receivables either directly or indirectly;

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[65] For a hybrid pool containing a mix of purchased receivables that can be categorised under two or more asset sub-classes and where the Reporting Bank cannot separate the purchased receivables by asset sub-class, the Reporting Bank shall apply the formula for the asset sub-class that results in the highest K_{df} for the purpose of calculating the credit risk-weighted exposure amount for the pool pursuant to sub-division 4 of Division 1.

[66] The estimates of PD and LGD shall be derived without regard to any assumption of recourse or other support (e.g. guarantees) from the seller or other parties.

(b) the receivables are generated on an arm's-length basis between the seller and the obligor. Inter-company accounts receivable and receivables subject to contra-accounts[67] between firms that buy and sell to each other are not eligible for the top-down treatment;

(c) the Reporting Bank has a claim on all proceeds from the pool of receivables or a *pro-rata* interest in the proceeds.[68] The existence of full or partial recourse to the seller is allowed as long as the cash flows from the purchased receivables are the primary protection against default risk as determined in this sub-division;

(d) the Reporting Bank is satisfied that the pool of receivables is sufficiently diversified;

(e) the Reporting Bank has earmarked the purchased receivables for securitisation or sale to be completed within 6 months from the date of purchase; and

(f) the Reporting Bank meets the requirements in Annex 7Y.

7.4.46 If a Reporting Bank fails to comply with the conditions set out in paragraph 7.4.45 after supervisory permission has been granted for it to adopt the top-down approach, the Authority may revoke its supervisory permission for the Reporting Bank to use the top-down approach, in which case the Reporting Bank shall calculate $K_{df, cp}$, $K_{df, sp}$ or both in accordance with paragraph 7.4.44. The Reporting Bank may also be subjected to higher bank-specific capital requirements or other actions by the Authority pursuant to Section 10(3) of the Banking Act.

Calculation of Capital Requirements for Dilution Risk, K_{dil}

7.4.47 A Reporting Bank shall calculate $K_{dil, cp}$, $K_{dil, sp}$ and $K_{dil, rp}$ using the following formula:

$$\text{Correlation } (R_{dil}) = 0.12 \times (1 - EXP(-50 \times PD_{dil})) / (1 - EXP(-50)) + 0.24 \times [1 - (1 - EXP(-50 \times PD_{dil}))/(1 - EXP(-50))]$$

$$\text{Maturity adjustment } (b) = (0.11852 - 0.05478 \times \ln(PD_{dil}))^{\wedge}2$$

$$\text{Capital requirement } (K_{dil, cp}, K_{dil, sp} \text{ or } K_{dil, rp}) = [LGD_{dil} \times N[(1 - R_{dil})^{\wedge}-0.5 \times G(PD_{dil}) + (R_{dil}/(1 - R_{dil}))^{\wedge}0.5 \times G(0.999)] - PD_{dil} \times LGD_{dil}] \times (1 - 1.5 \times b)^{\wedge} -1 \times (1 + (M_{dil} - 2.5) \times b)$$

where,

(a) PD_{dil} refers to the estimated one-year EL arising from dilution risk expressed as a percentage of the amount of receivables in the relevant pool. This estimate shall be calculated without regard to any assumption of recourse or other support (e.g. guarantees) from the seller or third-party guarantors;

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[67] Guideline: Contra-accounts involve a customer buying from and selling to the same firm. The risk is that debts may be settled through payments in kind rather than cash. Invoices between the companies may be offset against each other instead of being paid. This practice can defeat a security interest when challenged in court.

[68] Guideline: Claims on tranches of the proceeds (first loss position, second loss position, etc.) would fall under the securitisation treatment.

(b) LGD_{dil} = 100%; and

(c) M_{dil} is:

(i) the average effective maturity calculated in accordance with Annex 7Y for the relevant pool of receivables; or

(ii) 1 year if it can be demonstrated to the Authority's satisfaction that the Reporting Bank is able to monitor the dilution risk and has a track record of resolving incidents of dilution or dilution events within 1 year.

7.4.48 Where $K_{dil, cp}$, $K_{dil, sp}$ and $K_{dil, rp}$ for any IRBA exposure calculated in accordance with paragraph 7.4.47 above is less than 0, the Reporting Bank shall apply K = 0 for the purposes of calculating the credit risk-weighted exposure amount for that IRBA exposure pursuant to sub-division 4 of Division 1.

Sub-division 10: Treatment of Credit Protection

Treatment of Eligible Credit Protection Bought

7.4.49 A Reporting Bank that has eligible credit protection for an IRBA exposure categorised under the IRBA wholesale asset class for which it is using the F-IRBA to calculate the credit risk-weighted exposure amount may recognise the credit risk mitigation effects of the eligible credit protection as follows:

(a) divide the IRBA exposure into:

(i) a protected portion with EAD equal to the notional amount of the eligible credit protection; and

(ii) an unprotected portion with EAD equal to the EAD of the IRBA exposure less the notional amount of the eligible credit protection; and

(b) for the purposes of calculating the credit risk-weighted exposure amount pursuant to sub-division 4 of Division 1, use:

(i) for the protected portion:

(A) the formula for calculating K that is applicable to the eligible protection provider;

(B) the PD associated with the obligor grade to which the eligible protection provider is assigned or some grade between the obligor grades to which the underlying obligor and the eligible protection provider are assigned if the Reporting Bank considers appropriate, that is estimated in accordance with Annex 7U; and

(C) the LGD of the underlying transaction or the LGD applicable to the credit protection taking into account seniority and any collateralisation of the credit protection; and

(ii) for the unprotected portion:

(A) the formula for calculating K that is applicable to the underlying obligor;

(B) the PD associated with the obligor grade to which the underlying obligor is assigned and estimated in accordance with Annex 7U; and

(C) the LGD of the underlying transaction,

provided the Reporting Bank observes Annex 7E.

7.4.50 A Reporting Bank that has eligible credit protection for an IRBA exposure categorised under the IRBA wholesale asset class for which it is using the A-IRBA or IRBA for the IRBA retail asset class to calculate the credit risk-weighted exposure amount may recognise the credit risk mitigation effects of the eligible credit protection by adjusting either its estimates of PD or LGD, provided the Reporting Bank observes Annex 7E. Any adjustment to estimates of PD or LGD shall:

(a) be done in consistent manner for a given type of credit protection; and

(b) not recognise the effect of double default, i.e. the adjusted credit risk-weighted exposure amount shall not be less than that of a comparable direct exposure to the eligible protection provider.

MAS notes that BCBS issued in July 2005 further guidance[69] on the recognition of double default. MAS is currently reviewing the BCBS paper and will issue further draft guidance on this matter for consultation at a later date.

7.4.51 In cases of proportional cover, principal-only cover, partially eligible credit derivatives, tranched cover, basket credit derivatives and currency mismatches, a Reporting Bank may recognise the credit risk mitigation effects of the eligible credit protection by applying the relevant provisions in Annex 7S, provided the Reporting Bank observes Annex 7E.

7.4.52 In the case of an IRBA exposure within the IRBA eligible purchased receivables asset class, a Reporting Bank shall consider the availability of credit protection for default risk and dilution risk separately.[70]

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[69] "The Application of Basel II to Trading Activities and the Treatment of Double Default Effects," Basel Committee on Banking Supervision, July 2005.

[70] Guideline: For illustrative purposes:-

(a) If a guarantee covers both default risk and dilution risk, a Reporting Bank should substitute the capital requirement for an exposure to the guarantor in place of the total capital requirement for default risk and dilution risk applicable to the pool of receivables.

(b) If a guarantee covers only default risk or dilution risk, but not both, a Reporting Bank should substitute the capital requirement for an exposure to the guarantor in place of the capital requirement for the corresponding risk component that is covered (default risk or dilution risk). The capital requirement for the other component will then be added.

(c) If a guarantee covers only a portion of the default risk and/or dilution risk, the uncovered portion of the default risk and/or dilution risk should be treated as per the provisions in Annex 7W (i.e. the capital requirements of the uncovered portion will be added to the capital requirement of the covered portion).

Treatment of Credit Protection Sold

7.4.53 A Reporting Bank that has sold unfunded credit protection acquires exposure to the reference asset. If such exposure is an IRBA exposure, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the exposure pursuant to sub-division 4 of Division 1 using the formula for calculating K that is applicable to the obligor of the reference asset.

7.4.54 Subject to paragraph 7.4.55, if the unfunded credit protection has more than one reference asset, the credit risk-weighted exposure amount for the credit protection is the sum of the credit risk-weighted exposure amounts in respect of each reference asset calculated using the relevant formulas for calculating K that are applicable to the obligors of the respective reference assets. The Authority may, at its discretion, waive the additive rule on a case-by-case basis if it can be demonstrated to the Authority's satisfaction that there is sufficiently strong correlation between two or more reference assets. The capital requirement for the credit protection shall not exceed the nominal amount of the credit protection, i.e. the maximum possible payout under the credit protection.

7.4.55 If the unfunded credit protection is an nth-to-default credit derivative and it is not a securitisation exposure as defined in Division 6 of this Part, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection in accordance with paragraph 7.4.54 above, except that it may exclude from the calculation the credit risk-weighted exposure amounts relating to the n-1 reference asset(s) with the lowest credit risk-weighted exposure amount(s).

7.4.56 A Reporting Bank that has sold funded credit protection acquires exposure to both the reference asset and the protection buyer. If such exposures are IRBA exposures, the Reporting Bank shall calculate the credit risk-weighted exposure amount for the credit protection as the sum of:

(c) the credit risk-weighted exposure amount for the exposure to the reference asset calculated in accordance with paragraphs 7.4.53 to 7.4.55 above, as applicable; and

(d) the credit risk-weighted exposure amount for the exposure to the protection buyer, using:

   (i) EAD = the carrying value of the collateral placed with the protection buyer; and

   (ii) the formula for calculating K that is applicable to the protection buyer, unless the protection buyer is an SPE, in which case the formula for calculating K that is applicable to the collateral owned by the SPE shall be used.

7.4.57 The capital requirement for the credit protection calculated in accordance with paragraph 7.4.56 shall not exceed the nominal amount of the credit protection, i.e. the maximum possible payout under the credit protection

7.4.58 Notwithstanding paragraph 7.4.56 above, the credit risk-weighted exposure amount for funded credit protection shall be only the higher of the credit

risk-weighted exposure amounts calculated under sub-paragraph 7.4.56(a) and sub-paragraph 7.4.56(b) if[71]:

(a) the reference asset has a credit quality grade of "3" or above; and

(b) the protection buyer or collateral, as the case may be, has a credit quality grade of "3" or above.

as set out in Annex 7T.

Sub-division 11: Calculation of K for Defaulted Assets

7.4.59 A Reporting Bank shall calculate K_{def} using the following formula:

$$\text{Capital requirement } (K_{def}) = LGD - EL$$

where LGD refers to the LGD for the IRBA exposure, and EL refers to the best estimate of expected loss for that IRBA exposure by the Reporting Bank.

7.4.60 Where K_{def} for any IRBA exposure calculated in accordance with paragraph 7.4.59 above is less than 0, the Reporting Bank shall apply K = 0 for the purposes of calculating the credit risk-weighted exposure amount for that IRBA exposure pursuant to sub-division 4 of Division 1.

Sub-division 12: Supervisory Slotting Criteria

7.4.61 A Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-class or both should assign such exposures to internal borrower grades based on its own criteria, systems and processes. The Reporting Bank should then map these internal borrower grades into the five supervisory rating categories in Annex 7A according to the general assessment factors and characteristics exhibited by the exposures.

7.4.62 Subject to paragraph 7.4.63, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class shall risk-weight those exposures in accordance with Table 4-2.

Table 4-2: Risk Weight for Exposures in SL Asset Sub-Class

Category	Strong	Good	Satisfactory	Weak	Default
RW_{slot}	70%	90%	115%	250%	0%

7.4.63 A Reporting Bank may apply a risk weight of 50% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "strong" and a risk weight of 70% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

[71] For avoidance of doubt, this paragraph shall not apply if either the reference asset or the protection buyer or collateral, as the case may be, has a credit quality grade that is below "3", as set out in Annex 7T.

7.4.64 Subject to paragraph 7.4.65, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the HVCRE asset sub-class shall risk-weight those exposures in accordance with Table 4-3.

Table 4-3: Risk Weight for Exposures in HVCRE Asset Sub-Class

Category	Strong	Good	Satisfactory	Weak	Default
$\mathbf{RW_{slot}}$	95%	120%	140%	250%	0%

7.4.65 A Reporting Bank may apply a risk weight of 70% to any IRBA exposure belonging to the HVCRE asset sub-class that is categorised as "strong" and a risk weight of 95% to any IRBA exposure belonging to the HVCRE asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

Sub-division 13: Calculation of Expected Losses ("EL")

7.4.66 A Reporting Bank shall calculate EL for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) or IRBA retail asset classes that is not in default in accordance with the definition of default in Annex 7W using the following formula:

$$EL = PD \times LGD ,$$

where

EL = expected loss

PD = PD associated with the obligor grade/segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7U

LGD = LGD associated with the facility grade/segment to which the IRBA exposure is assigned and estimated in accordance with Annex 7U

7.4.67 Subject to paragraph 7.4.68, EL for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) or IRBA retail asset class that is in default in accordance with the definition of default in Annex 7W shall be the best estimate of expected loss by the Reporting Bank.

7.4.68 For a Reporting Bank using the F-IRBA, EL for an IRBA exposure belonging to the IRBA wholesale asset class (other than an exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria) that is in default in accordance with the definition of default in Annex 7W shall be equal to the supervisory LGD in paragraph 7.4.28.

7.4.69 Subject to paragraph 7.4.70, a Reporting Bank using the supervisory slotting criteria for IRBA exposures belonging to the SL asset sub-class or HVCRE asset sub-class shall calculate EL for an IRBA exposure belonging to either of these sub-classes using the following formula:

$$EL = 8\% \times RW \times EAD ,$$

where

EL = expected loss

RW = risk weight determined in accordance with Table 4-4 for an exposure belonging to the SL asset sub-class and Table 4-5 for an exposure belonging to the HVCRE asset sub-class

EAD = EAD, or where applicable EAD*, for the exposure calculated in accordance with Division 2 of this Part

Table 4-4: Risk Weight for Calculating EL of Exposures in SL Asset Sub-Class

Category	Strong	Good	Satisfactory	Weak	Default
$\mathbf{RW_{slot}}$	5%	10%	35%	100%	625%

Table 4-5: Risk Weight for Calculating EL of Exposures in HVCRE Asset Sub-Class

Category	Strong	Good	Satisfactory	Weak	Default
$\mathbf{RW_{slot}}$	5%	5%	35%	100%	625%

7.4.70 A Reporting Bank may apply a risk weight of 0% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "strong" and a risk weight of 5% to any IRBA exposure belonging to the SL asset sub-class that is categorised as "good", provided such exposures have a remaining maturity of less than 2.5 years.

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Annex 7A

SPECIALISED LENDING ("SL") AND HIGH VOLATILITY COMMERCIAL REAL ESTATE LENDING ("HVCRE") ASSET SUB-CLASSES

Section A: Definition of SL and HVCRE Asset Sub-Classes

(This Section sets out guidelines for the definition and categorisation of IRBA exposures belonging to the SL and HVCRE asset sub-classes. The Authority will take into account the observance of these guidelines by a Reporting Bank in assessing whether the Reporting Bank has complied with section 10(2) of the Banking Act.)

1 An IRBA exposure belonging to the SL asset sub-class possesses all of the following characteristics, either in legal form or economic substance:

(a) the exposure is typically to an entity (often a special purpose entity) which was created specifically to finance and/or operate physical assets;

(b) the obligor usually has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income that it receives from the asset(s) being financed;

(c) the terms of the obligation give the Reporting Bank a substantial degree of control over the asset(s) and the income that such asset(s) generate; and

(d) as a result of the preceding factors, the primary source of repayment of the obligation is the income generated by the asset(s), rather than the independent capacity of the obligor.

2 The five types of exposures within the SL asset sub-class are project finance ("PF"), object finance ("OF"), commodities finance ("CF"), income-producing real estate lending ("IPRE") and high-volatility commercial real estate lending ("HVCRE").

Project Finance

3 Project finance (PF) is a method of funding in which the Reporting Bank looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. Project finance may take the form of financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements.

4 In a project finance transaction, the Reporting Bank is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The obligor is usually an SPE that is not permitted to perform any function other than developing, owning, and operating the installation. The consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets. In contrast,

if repayment of the exposure depends primarily on a well established, diversified, credit-worthy, contractually obligated end-user for repayment, it is considered a secured exposure to that end-user.

Object Finance

5 Object finance (OF) refers to a method of funding the acquisition of physical assets (e.g. ships, aircraft, satellites, railcars, and fleets) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the Reporting Bank. A primary source of these cash flows might be rental or lease contracts with one or several third parties. In contrast, if the exposure is to an obligor whose financial condition and debt-servicing capacity enables it to repay the debt without undue reliance on the specifically pledged assets, the exposure should be treated as a collateralised corporate exposure.

Commodities Finance

6 Commodities finance (CF) refers to structured short-term lending to finance reserves, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the obligor has no independent capacity to repay the exposure. This is the case when the obligor has no other activities and no other material assets on its balance sheet. The structured nature of the financing is designed to compensate for the weak credit quality of the obligor. The exposure's rating reflects its self-liquidating nature and the Reporting Bank's skill in structuring the transaction rather than the credit quality of the obligor.

7 Such lending can be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate obligors. Reporting Banks are able to rate the credit quality of the latter type of obligors based on their broader ongoing operations. In such cases, the value of the commodity serves as a risk mitigant rather than as the primary source of repayment.

Income-Producing Real Estate

8 Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be lease or rental payments or the sale of the asset. The obligor may be, but is not required to be, an SPE, an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralised by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

High-Volatility Commercial Real Estate Lending

9 High-volatility commercial real estate lending ("HVCRE") refers to the financing of commercial real estate designated as such by the Authority.[72]

Case Studies

10 Some case studies on the categorisation of IRBA exposures based on the definitions above are as follows[73]:

Project Finance

(a) A Reporting Bank finances an SPE that will build and operate a project. The SPE has an off-take contract with an end-user. The length of the off-take contract covers the full maturity of the loan, and the loan amortises fully during the length of the contract. The payments by the end-user to the SPE are based mainly on the ability of the SPE to provide the specified output/services and not on the actual demand for the output/services. If the contract is terminated, the end-user is normally required to purchase the underlying assets at a price related to the market value of the unexpired term of the contract. This should be considered as an exposure belonging to the corporate asset sub-class rather than the SL asset sub-class.

(b) A Reporting Bank finances an SPE that will build and operate a project. If the Reporting Bank is exposed to the key risks in the project - construction risk (the risk that the project will not be completed in a timely and/or cost effective manner), operational/technology risk (the risk that the project will not operate up to specifications), or market/price risk (the risk that the demand and the price of the output will fall and/or that the margin between output prices and input prices and production costs will deteriorate), the project should be categorised within the SL asset sub-class. If a circular relationship exists between the end-user's and the project's financial strength, the project should be categorised under the SL asset sub-class. This would be the case when an end-user has limited resources or capacity to generate revenues apart from those generated by the project being financed, so that the end-user's ability to honour its off-take contract depends primarily on the performance of the project.

(c) If a Reporting Bank provides a loan to finance a transatlantic fibre optic cable to an established telecommunications firm, which has an established business plan, track record and diversified revenue stream, the exposure would be considered as belonging to the corporate asset sub-class.

Object Finance

(d) A recently established charter airline finances the purchase of two aircraft. The airline does not have an established record of financial or operational performance, and the Reporting Bank would not normally extend long-term credit to the airline. An SPE owns the aircraft and

[72] The Authority has not designated any specific property type as HVCRE.

[73] The examples are for illustrative purposes only and not intended to be exhaustive. The actual operation of the principles embodied in paragraphs 1 to 9 of this Annex may vary depending on the circumstances in each case.

leases it to the airline. The legal structure of the transaction is such that the Reporting Bank, in the event of default, can seize and re-market the aircraft without delay. Such a loan would be assigned to the SL asset sub-class given that the obligor's ability to service the loan is unproven and the Reporting Bank's credit decision is largely based on its ability to re-market the collateral in the event of the obligor's default. In this case, the asset-based focus is supported by a loan structure that supports this premise (e.g. the amortisation schedule mirrors the anticipated depreciation of the aircraft's fair value, the Reporting Bank has the right to quickly gain control of the aircraft in the event of default and/or bankruptcy, and the Reporting Bank has control over the airline's lease payments).

(e) A charter airline with an established business plan, many aircraft, and diversified service routes finances the purchase of additional aircraft to be used in its own operations. The airline establishes an SPE to own the subject aircraft. The Reporting Bank lends to the SPE and takes a security interest in the aircraft. The SPE enters into a long-term lease with the airline. The lease's term exceeds the term of the underlying loan. The lease cannot be terminated under any condition. This exposure would be placed in the corporate asset sub-class because the repayment of the loan depends on the overall operations of the airline and is not unduly dependent upon the specific aircraft as the primary source of repayment.

(f) Same example as above, except that (i) the lease term can be cancelled by the airline without penalty at some time before the end of the loan term, or (ii) even if the lease is non-cancellable, the lease payments do not fully cover the aggregate loan payments over the life of the loan. This loan should be categorised within the SL asset sub-class, given that the airline/lessee is not fully committed to a lease sufficient to repay the loan, so pass-through treatment is inappropriate.

(g) A large, well-established shipping company sets up an SPE as a subsidiary. There is no contractual recourse between the shipping company and the SPE. The SPE wishes to finance a container ship, and the income from container shipping (either by the SPE leasing the ship to third parties or doing the shipping itself) serves as the sole repayment source for the loan. Such a loan would be categorised within the SL asset sub-class because the primary source of repayment is the container ship and its income generating ability. The Reporting Bank's ability to base the transaction's rating on the shipping company's financial capacity is hampered, given that the shipping company is not contractually obligated to repay the debt or make payments to the SPE sufficient to repay the debt. Instead, the loan is structured so that the cash flow from the specified asset, and not the general financial capacity of the shipping company, serves as the primary source of repayment.

<u>Commodities Finance</u>

(h) The Reporting Bank extends short-term documentary trade credit to a small independent trading company that acts as an intermediary between producers and their customers. The trader specialises in a single commodity and a single region. Each commodity shipment handled by the trader is financed and secured separately. Credit is

extended upon delivery of the commodity to the trader, who has already contracted for the resale of the commodity shipment. A trust-worthy third party controls the shipment of the commodity, and the bank controls payment by the customer. This loan would be categorised as an exposure in the SL asset sub-class, since repayment depends primarily on the proceeds of the sale of the commodity.

(i) The Reporting Bank extends short-term documentary trade credit to a small trader. The circumstances are the same as in the preceding case, except that the trader has not yet contracted for the resale of the commodity. This loan would be categorised as an exposure in the corporate asset sub-class since it may not be self-liquidating, given that the trader has not hedged the transaction's market risk. The Reporting Bank's credit exposure is primarily to the non-hedged trader that is long the commodity.

(j) The Reporting Bank provides an unsecured non-transactional working capital loan to a small trader, either separately or as part of a transactional credit facility. Such an unsecured loan would be categorised within the corporate asset sub-class, since its repayment depends on the trader rather than on the revenues generated by the sale of any specific commodity shipment being financed.

Income-Producing Real Estate Lending

(k) A Reporting Bank makes a loan to an SPE to finance the construction of an office building that will be let to tenants. The SPE has essentially no other assets and has been created just to manage this office building. The office building is pledged as collateral on the loan. This loan should be categorised with the SL asset sub-class, given that the prospects for repayment and recovery depend primarily on the cash flow generated by the asset.

(l) A Reporting Bank makes a loan to a large, well-diversified operating company to finance the construction of an office building that will be primarily occupied by the company. The office building is pledged as collateral on the loan, and the loan is a general obligation of the company. The loan is small relative to the overall assets and debt service capacity of the company. This loan should be categorised as an exposure within the corporate asset sub-class since repayment depends primarily on the overall condition of the operating company, which does not in turn depend significantly on the cash flow generated by the asset.

(m) A Reporting Bank makes a loan to an operating company to finance the construction or acquisition of an office building that will be let to tenants. The office building is pledged as collateral on the loan, and the loan is a general obligation of the company. The company has essentially no other assets. The Reporting Bank underwrites the loan using its corporate procedures. Despite the fact that the borrower is an operating company and the Reporting Bank uses its corporate underwriting procedures, this loan should be categorised within the SL asset sub-class. The motivation is that the prospects for repayment and recovery both depend primarily on the cash flow generated by the asset. Although there is legal recourse to the project sponsor, which is an operating company, the overall condition of the project

sponsor depends primarily on the cash flow generated by the asset. Therefore, in the event of project failure, the sponsor will have essentially no ability to meet its general obligations.

(n) Same as above, except that the loan is unsecured. Again, the loan should be categorised as an exposure within the SL asset sub-class. The fact that the office building is not pledged as collateral on the loan does not override the fact that the loan shares the risk characteristics common to IPRE loans in the SL asset sub-class.

(o) A Reporting Bank makes a loan to an SPE to finance the acquisition of an office building that will be primarily leased to a large, well-diversified operating company under a long-term lease. The SPE has essentially no other assets and has been created just to manage this office building. The lease is at least as long as the loan term and is non-cancellable, and the lease payments completely cover the cash flow needs of the obligor (debt service, capital expenditures, operating expenses, etc.). The loan is amortised fully over the term of the lease with no bullet or balloon payment at maturity. In categorising this loan the Reporting Bank may look through the SPE to the long-term tenant, treating it as an exposure within the corporate asset sub-class. This is because the prospects for repayment and recovery depend primarily on the overall condition of the long-term tenant, which will determine the cash flow generated by the asset.

(p) Same as above, except that (i) the lease term can be cancelled at some time before the end of the loan term, or (ii) even if the lease is non-cancellable, the lease payments do not fully cover the aggregate loan payments over the life of the loan. This loan should be categorised in the SL asset sub-class. This is because the tenant is not fully committed to the lease sufficient to repay the loan, so pass-through treatment is inappropriate.

Section B: Guidelines on Supervisory Rating Categories

11 The following tables set out guidelines on the supervisory rating categories to be used for determining RW_{slot} for any IRBA exposure belonging to the SL asset sub-class or HVCRE asset sub-class for which the Reporting Bank is using the supervisory slotting criteria to calculate the credit risk-weighted exposure amount of the exposure.

Table 7A-1 – Guidelines on Supervisory Rating Categories for Project Finance

	Strong	**Good**	**Satisfactory**	**Weak**
Financial Strength				
Market conditions	Few competing suppliers or substantial and durable advantage in location, cost, or technology. Demand is strong and growing	Few competing suppliers or better than average location, cost, or technology but this situation may not last. Demand is strong and stable	Project has no advantage in location, cost, or technology. Demand is adequate and stable	Project has worse than average location, cost, or technology. Demand is weak and declining
Financial ratios (e.g. *debt service coverage ratio (DSCR), loan life coverage ratio (LLCR), project life coverage ratio (PLCR), and debt-to-equity ratio*)	Strong financial ratios considering the level of project risk; very robust economic assumptions	Strong to acceptable financial ratios considering the level of project risk; robust project economic assumptions	Standard financial ratios considering the level of project risk	Aggressive financial ratios considering the level of project risk
Stress analysis	The project can meet its financial obligations under sustained, severely stressed economic or sectoral conditions	The project can meet its financial obligations under normal stressed economic or sectoral conditions. The project is only likely to default under severe economic conditions	The project is vulnerable to stresses that are not uncommon through an economic cycle, and may default in a normal downturn	The project is likely to default unless conditions improve soon
Financial structure				
Duration of the credit compared to the duration of the project	Useful life of the project significantly exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan	Useful life of the project may not exceed tenor of the loan
Amortisation schedule	Amortising debt	Amortising debt	Amortising debt repayments with limited bullet payment	Bullet repayment or amortising debt repayments with high bullet repayment

	Strong	Good	Satisfactory	Weak
Political and legal environment				
Political risk, including transfer risk, considering project type and mitigants	Very low exposure; strong mitigation instruments, if needed	Low exposure; satisfactory mitigation instruments, if needed	Moderate exposure; fair mitigation instruments	High exposure; no or weak mitigation instruments
Force majeure risk (war, civil unrest, etc),	Low exposure	Acceptable exposure	Standard protection	Significant risks, not fully mitigated
Government support and project's importance for the country over the long term	Project of strategic importance for the country (preferably export-oriented). Strong support from Government	Project considered important for the country. Good level of support from Government	Project may not be strategic but brings unquestionable benefits for the country. Support from Government may not be explicit	Project not key to the country. No or weak support from Government
Stability of legal and regulatory environment (risk of change in law)	Favourable and stable regulatory environment over the long term	Favourable and stable regulatory environment over the medium term	Regulatory changes can be predicted with a fair level of certainty	Current or future regulatory issues may affect the project
Acquisition of all necessary supports and approvals for such relief from local content laws	Strong	Satisfactory	Fair	Weak
Enforceability of contracts, collateral and security	Contracts, collateral and security are enforceable	Contracts, collateral and security are enforceable	Contracts, collateral and security are considered enforceable even if certain non-key issues may exist	There are unresolved key issues in respect if actual enforcement of contracts, collateral and security
Transaction characteristics				
Design and technology risk	Fully proven technology and design	Fully proven technology and design	Proven technology and design – start-up issues are mitigated by a strong completion package	Unproven technology and design; technology issues exist and/or complex design

	Strong	**Good**	**Satisfactory**	**Weak**
Construction risk				
Permitting and siting	All permits have been obtained	Some permits are still outstanding but their receipt is considered very likely	Some permits are still outstanding but the permitting process is well defined and they are considered routine	Key permits still need to be obtained and are not considered routine. Significant conditions may be attached
Type of construction contract	Fixed-price date-certain turnkey construction EPC (engineering and procurement contract)	Fixed-price date-certain turnkey construction EPC	Fixed-price date-certain turnkey construction contract with one or several contractors	No or partial fixed-price turnkey contract and/or interfacing issues with multiple contractors
Completion guarantees	Substantial liquidated damages supported by financial substance and/or strong completion guarantee from sponsors with excellent financial standing	Significant liquidated damages supported by financial substance and/or completion guarantee from sponsors with good financial standing	Adequate liquidated damages supported by financial substance and/or completion guarantee from sponsors with good financial standing	Inadequate liquidated damages or not supported by financial substance or weak completion guarantees
Track record and financial strength of contractor in constructing similar projects.	Strong	Good	Satisfactory	Weak
Operating risk				
Scope and nature of operations and maintenance (O & M) contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts	Long-term O&M contract, and/or O&M reserve accounts	Limited O&M contract or O&M reserve account	No O&M contract: risk of high operational cost overruns beyond mitigants
Operator's expertise, track record, and financial strength	Very strong, or committed technical assistance of the sponsors	Strong	Acceptable	Limited/weak, or local operator dependent on local authorities

	Strong	Good	Satisfactory	Weak
Off-take risk				
(a) If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of offtaker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt	Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt	Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt	Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt
(b) If there is no take-or-pay or fixed-price off-take contract:	Project produces essential services or a commodity sold widely on a world market; output can readily be absorbed at projected prices even at lower than historic market growth rates	Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates	Commodity is sold on a limited market that may absorb it only at lower than projected prices	Project output is demanded by only one or a few buyers or is not generally sold on an organised market
Supply risk				
Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength	Long-term supply contract with supplier of excellent financial standing	Long-term supply contract with supplier of good financial standing	Long-term supply contract with supplier of good financial standing – a degree of price risk may remain	Short-term supply contract or long-term supply contract with financially weak supplier – a degree of price risk definitely remains
Reserve risks (e.g. natural resource development)	Independently audited, proven and developed reserves well in excess of requirements over lifetime of the project	Independently audited, proven and developed reserves in excess of requirements over lifetime of the project	Proven reserves can supply the project adequately through the maturity of the debt	Project relies to some extent on potential and undeveloped reserves
Strength of Sponsor				
Sponsor's track record, financial strength, and country/sector experience	Strong sponsor with excellent track record and high financial standing	Good sponsor with satisfactory track record and good financial standing	Adequate sponsor with adequate track record and good financial standing	Weak sponsor with no or questionable track record and/or financial weaknesses

	Strong	**Good**	**Satisfactory**	**Weak**
Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if necessary	Strong. Project is highly strategic for the sponsor (core business – long-term strategy)	Good. Project is strategic for the sponsor (core business – long-term strategy)	Acceptable. Project is considered important for the sponsor (core business)	Limited. Project is not key to sponsor's long-term strategy or core business
Security Package				
Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
Pledge of assets, taking into account quality, value and liquidity of assets	First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project	Little security or collateral for lenders; weak negative pledge clause
Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak
Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions…)	Covenant package is strong for this type of project Project may issue no additional debt	Covenant package is satisfactory for this type of project Project may issue extremely limited additional debt	Covenant package is fair for this type of project Project may issue limited additional debt	Covenant package is Insufficient for this type of project Project may issue unlimited additional debt
Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc)	Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank	Average coverage period, all reserve funds fully funded	Average coverage period, all reserve funds fully funded	Shorter than average coverage period, reserve funds funded from operating cash flows

Table 7A-2 – Guidelines on Supervisory Rating Categories for Object Finance

	Strong	Good	Satisfactory	Weak
Financial Strength				
Market conditions	Demand is strong and growing, strong entry barriers, low sensitivity to changes in technology and economic outlook	Demand is strong and stable. Some entry barriers, some sensitivity to changes in technology and economic outlook	Demand is adequate and stable, limited entry barriers, significant sensitivity to changes in technology and economic outlook	Demand is weak and declining, vulnerable to changes in technology and economic outlook, highly uncertain environment
Financial ratios (debt service coverage ratio and loan-to-value ratio)	Strong financial ratios considering the type of asset. Very robust economic assumptions	Strong / acceptable financial ratios considering the type of asset. Robust project economic assumptions	Standard financial ratios for the asset type	Aggressive financial ratios considering the type of asset
Stress analysis	Stable long-term revenues, capable of withstanding severely stressed conditions through an economic cycle	Satisfactory short-term revenues. Loan can withstand some financial adversity. Default is only likely under severe economic conditions	Uncertain short-term revenues. Cash flows are vulnerable to stresses that are not uncommon through an economic cycle. The loan may default in a normal downturn	Revenues subject to strong uncertainties; even in normal economic conditions the asset may default, unless conditions improve
Market liquidity	Market is structured on a worldwide basis; assets are highly liquid	Market is worldwide or regional; assets are relatively liquid	Market is regional with Limited prospects in the short term, implying lower liquidity	Local market and/or poor visibility. Low or no liquidity, particularly on niche markets
Political and legal environment				
Political risk, including transfer risk	Very low; strong mitigation instruments, if needed	Low; satisfactory mitigation instruments, if needed	Moderate; fair mitigation instruments	High; no or weak mitigation instruments
Legal and regulatory risks	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is favourable to repossession and enforcement of contracts	Jurisdiction is generally favourable to repossession and	Poor or unstable legal and regulatory environment. Jurisdiction may make

	Strong	Good	Satisfactory	Weak
			enforcement of contracts, even if repossession might be long and/or difficult	repossession and enforcement of contracts lengthy or impossible
Transaction characteristics				
Financing term compared to the economic life of the asset	Full payout profile/ minimum balloon. No grace period	Balloon more significant, but still at satisfactory levels	Important balloon with potentially grace periods	Repayment in fine or high balloon
Operating risk				
Permits / licensing	All permits have been obtained; asset meets current and foreseeable safety regulations	All permits obtained or in the process of being obtained; asset meets current and foreseeable safety regulations	Most permits obtained or in process of being obtained, outstanding ones considered routine, asset meets current safety regulations	Problems in obtaining all required permits, part of the planned configuration and/or planned operations might need to be revised
Scope and nature of O & M contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts (if needed)	Long-term O&M contract, and/or O&M reserve accounts (if needed)	Limited O&M contract or O&M reserve account (if needed)	No O&M contract: risk of high operational cost overruns beyond mitigants
Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes off-lease	Excellent track record and strong re-marketing capability	Satisfactory track record and remarketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset
Asset characteristics				
Configuration, size, design and maintenance (i.e. age, size for a plane) compared to other assets on the same market	Strong advantage in design and maintenance. Configuration is standard such that the object meets a liquid market	Above average design and maintenance. Standard configuration, maybe with very limited exceptions - such that the object meets a liquid market	Average design and maintenance. Configuration is somewhat specific, and thus might cause a narrower	Below average design and maintenance. Asset is near the end of its economic life. Configuration is very specific; the market for the object is very narrow

	Strong	Good	Satisfactory	Weak
			market for the object	
Resale value	Current resale value is well above debt value	Resale value is moderately above debt value	Resale value is slightly above debt value	Resale value is below debt value
Sensitivity of the asset value and liquidity to economic cycles	Asset value and liquidity are relatively insensitive to economic cycles	Asset value and liquidity are sensitive to economic cycles	Asset value and liquidity are quite sensitive to economic cycles	Asset value and liquidity are highly sensitive to economic cycles
Strength of sponsor				
Operator’s financial strength, track record in managing the asset type and capability to re-market asset when it comes offlease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to remarket the asset
Sponsors’ track record and financial strength	Sponsors with excellent track record and high financial standing	Sponsors with good track record and good financial standing	Sponsors with adequate track record and good financial standing	Sponsors with no or questionable track record and/or financial weaknesses
Security Package				
Asset control	Legal documentation provides the lender effective control (e.g. a first perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	The contract provides little security to the lender and leaves room to some risk of losing control on the asset
Rights and means at the lender's disposal to monitor the location and condition of the asset	The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections)	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset are limited

	Strong	Good	Satisfactory	Weak
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Table 7A-3 – Guidelines on Supervisory Rating Categories for Commodities Finance

	Strong	**Good**	**Satisfactory**	**Weak**
Financial Strength				
Degree of over-collateralization of trade	Strong	Good	Satisfactory	Weak
Political and legal environment				
Country risk	No country risk	Limited exposure to country risk (in particular, offshore location of reserves in an emerging country)	Exposure to country risk (in particular, offshore location of reserves in an emerging country)	Strong exposure to country risk (in particular, inland reserves in an emerging country)
Mitigation of country risks	Very strong mitigation: Strong offshore Mechanisms Strategic commodity 1st class buyer	Strong mitigation: Offshore mechanisms Strategic commodity Strong buyer	Acceptable mitigation: Offshore mechanisms Less strategic commodity Acceptable buyer	Only partial mitigation: No offshore mechanisms Non-strategic commodity Weak buyer
Asset characteristics				
Liquidity and susceptibility to damage	Commodity is quoted and can be hedged through futures or OTC instruments. Commodity is not susceptible to damage	Commodity is quoted and can be hedged through OTC instruments. Commodity is not susceptible to damage	Commodity is not quoted but is liquid. There is uncertainty about the possibility of hedging. Commodity is not susceptible to damage	Commodity is not quoted. Liquidity is limited given the size and depth of the market. No appropriate hedging instruments. Commodity is susceptible to damage
Strength of Sponsor				
Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak

	Strong	Good	Satisfactory	Weak
Track record, including ability to manage the logistic process	Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency	Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency	Limited experience with the type of transaction in question. Average record of operating success and cost efficiency	Limited or uncertain track record in general. Volatile costs and profits
Trading controls and hedging policies	Strong standards for counterparty selection, hedging, and monitoring	Adequate standards for counterparty selection, hedging, and monitoring	Past deals have experienced no or minor problems	Trader has experienced significant losses on past deals
Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
Security Package				
Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed	First perfected security interest provides the lender legal control of the assets at any time if needed	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardised
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Table 7A-4 – Guidelines on Supervisory Rating Categories for Income-Producing Real Estate Exposures and High-Volatility Commercial Real Estate

	Strong	Good	Satisfactory	Weak
Financial Strength				
Market conditions	The supply and demand for the project's type and location are currently in equilibrium. The number of competitive properties coming to market is equal or lower than forecasted demand	The supply and demand for the project's type and location are currently in equilibrium. The number of competitive properties coming to market is roughly equal to forecasted demand	Market conditions are roughly in equilibrium. Competitive properties are coming on the market and others are in the planning stages. The project's design and capabilities may not be state of the art compared to new projects	Market conditions are weak. It is uncertain when conditions will improve and return to equilibrium. The project is losing tenants at lease expiration. New lease terms are less favourable compared to those expiring
Financial ratios and advance rate	The property's debt service coverage ratio (DSCR) is considered strong (DSCR is not relevant for the construction phase) and its loan to value ratio (LTV) is considered low given its property type. Where a secondary market exists, the transaction is underwritten to market standards	The DSCR (not relevant for development real estate) and LTV are satisfactory. Where a secondary market exists, the transaction is underwritten to market standards	The property's DSCR has deteriorated and its value has fallen, increasing its LTV	The property's DSCR has deteriorated significantly and its LTV is well above underwriting standards for new loans
Stress analysis	The property's resources, contingencies and liability structure allow it to meet its financial obligations during a period of severe financial stress (e.g. interest rates, economic growth)	The property can meet its financial obligations under a sustained period of financial stress (e.g. interest rates, economic growth). The property is likely to default only under severe economic conditions	During an economic downturn, the property would suffer a decline in revenue that would limit its ability to fund capital expenditures and significantly increase the risk of default	The property's financial condition is strained and is likely to default unless conditions improve in the near term

	Strong	Good	Satisfactory	Weak
Cash-flow predictability				
(a) For complete and stabilised property.	The property's leases are long-term with creditworthy tenants and their maturity dates are scattered. The property has a track record of tenant retention upon lease expiration. Its vacancy rate is low. Expenses (maintenance, insurance, security, and property taxes) are predictable	Most of the property's leases are long-term, with tenants that range in creditworthiness. The property experiences a normal level of tenant turnover upon lease expiration. Its vacancy rate is low. Expenses are predictable	Most of the property's leases are medium rather than long-term with tenants that range in creditworthiness. The property experiences a moderate level of tenant turnover upon lease expiration. Its vacancy rate is moderate. Expenses are relatively predictable but vary in relation to revenue	The property's leases are of various terms with tenants that range in creditworthiness. The property experiences a very high level of tenant turnover upon lease expiration. Its vacancy rate is high. Significant expenses are incurred preparing space for new tenants
(b) For complete but not stabilised property	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Most leasing activity is within projections; however, stabilisation will not occur for some time	Market rents do not meet expectations. Despite achieving target occupancy rate, cash flow coverage is tight due to disappointing revenue
(c) For construction phase	The property is entirely pre-leased through the tenor of the loan or pre-sold to an investment grade tenant or buyer, or the bank has a binding commitment for take-out financing from an investment grade lender	The property is entirely pre-leased or pre-sold to a creditworthy tenant or buyer, or the bank has a binding commitment for permanent financing from a creditworthy lender	Leasing activity is within projections but the building may not be pre-leased and there may not exist a takeout financing. The bank may be the permanent lender	The property is deteriorating due to cost overruns, market deterioration, tenant cancellations or other factors. There may be a dispute with the party providing the permanent financing
Asset characteristics				
Location	Property is located in highly desirable location that is convenient to services that tenants	Property is located in desirable location that is convenient to services that tenants desire	The property location lacks a competitive advantage	The property's location, configuration, design and maintenance have contributed to the

	Strong	Good	Satisfactory	Weak
	desire			property's difficulties
Design and condition	Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties	Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties	Property is adequate in terms of its configuration, design and maintenance	Weaknesses exist in the property's configuration, design or maintenance
Property is under construction	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Construction budget is adequate and contractors are ordinarily qualified	Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified
Strength of Sponsor/Developer				
Financial capacity and willingness to support the property.	The sponsor/developer made a substantial cash contribution to the construction or purchase of the property. The sponsor/developer has substantial resources and limited direct and contingent liabilities. The sponsor/developer's properties are diversified geographically and by property type	The sponsor/developer made a material cash contribution to the construction or purchase of the property. The sponsor/developer's financial condition allows it to support the property in the event of a cash flow shortfall. The sponsor/developer's properties are located in several geographic regions	The sponsor/developer's contribution may be immaterial or non-cash. The sponsor/developer is average to below average in financial resources	The sponsor/developer lacks capacity or willingness to support the property
Reputation and track record with similar properties.	Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties	Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties	Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns	Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the

	Strong	Good	Satisfactory	Weak
				past
Relationships with relevant real estate actors	Strong relationships with leading actors such as leasing agents	Proven relationships with leading actors such as leasing agents	Adequate relationships with leasing agents and other parties providing important real estate services	Poor relationships with leasing agents and/or other parties providing important real estate services
Security Package				
Nature of lien	Perfected first lien[74]	Perfected first lien[3]	Perfected first lien[3]	Ability of lender to foreclose is constrained
Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants
Quality of the insurance coverage	Appropriate	Appropriate	Appropriate	Substandard

[74] Lenders in some markets extensively use loan structures that include junior liens. Junior liens may be indicative of this level of risk if the total LTV inclusive of all senior positions does not exceed a typical first loan LTV.

Annex 7B

CREDIT CONVERSION FACTORS FOR OFF-BALANCE SHEET ITEMS UNDER SA(CR)

	Description of Off-balance Sheet Item	Credit Conversion Factor

(i)	Direct credit substitutes[75]	100%
(ii)	Certain transaction-related contingent items[76]	50%
(iii)	Short-term self-liquidating trade-related contingent items[77] (applicable to both issuing and confirming banks)	20%
(iv)	Note issuance facilities and revolving underwriting facilities	50%
(v)	Transactions, other than SFTs, involving the posting of securities held by the Reporting Bank as collateral	100%
(vi)	Asset sales with recourse, where the credit risk remains with the Reporting Bank[78]	100%
(vii)	Other commitments with certain drawdown	100%
(viii)	Other commitments[79]	
	(a) with an original maturity of more than one year	50%
	(b) with an original maturity of one year or less	20%
	(c) which are unconditionally cancellable at any time by the Reporting Bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in an obligor's creditworthiness[80]	0%

75 For example, general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements with the character of acceptances).

76 For example, performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.

77 For example, documentary credits collateralised by the underlying shipments.

78 The terms of the agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty.

79 For example, formal standby facilities and credit lines. The capital treatment for commitments to provide liquidity facilities to ABCP or other securitisation vehicles is set out in Division 6 of Part VII of this Notice.

80 The Reporting Bank should be prepared to demonstrate (if required to do so by the Authority) that it actively monitors the financial condition of the obligor, and that its internal control systems are such that it could cancel the facility upon evidence of a deterioration in the credit quality of the obligor.

Annex 7C

CREDIT CONVERSION FACTORS FOR OFF-BALANCE SHEET ITEMS UNDER IRBA[81]

	Description of Off-balance Sheet Item	Credit Conversion Factor	
		FIRBA	AIRBA
(i)	Direct credit substitutes[82]	100%	100%
(ii)	Certain transaction-related contingent items[83]	50%	Internal estimates
(iii)	Short-term self-liquidating trade-related contingent items[84] (applicable to both issuing and confirming banks)	20%	Internal estimates
(iv)	Note issuance facilities and revolving underwriting facilities	75%	Internal estimates
(v)	Transactions, other than SFTs, involving the posting of securities held by the Reporting Bank as collateral	100%	100%
(vi)	Asset sales with recourse, where the credit risk remains with the Reporting Bank[85]	100%	100%
(vii)	Other commitments with certain drawdown	100%	100%
(viii)	Other commitments[86]		
	(a) with an original maturity of more than one year	75%	Internal estimates
	(b) with an original maturity of one year or less	75%	Internal estimates
	(c) which are unconditionally cancellable at any time by the Reporting Bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in an obligor's creditworthiness[87]	0%	Internal estimates

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81 For retail off-balance sheet items, Reporting Banks shall use their own estimates of CCFs subject to meeting the requirements in paragraphs 474 to 477 and 479 [335]

82 For example, general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements with the character of acceptances.

83 For example, performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions.

84 For example, documentary credits collateralised by the underlying shipments.

85 The terms of the agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty.

86 For example, formal standby facilities and credit lines. The capital treatment for commitments to provide liquidity facilities to ABCP or other securitisation vehicles is set out in Division 6 of Part VII of this Notice.

87 The Reporting Bank should be prepared to demonstrate (if required to do so by the Authority) that it actively monitors the financial condition of the obligor, and that its internal control systems are such that it could cancel the facility upon evidence of a deterioration in the credit quality of the obligor.

1.1 The amount to which the CCF is applied is the lower of the value of the unused committed credit line, and the value that reflects any possible constraining availability of the facility, such as the existence of a ceiling on the potential lending amount which is related to an obligor's reported cash flow. If the facility is constrained in this way, the Reporting Bank shall have sufficient line monitoring and management procedures to support this contention.

1.2 Where a commitment is obtained on another off-balance sheet exposure, a Reporting Bank using the FIRBA should apply the lower of the applicable CCFs.

ELIGIBLE FINANCIAL COLLATERAL

1.1 For a Reporting Bank using the FC(SA), eligible financial collateral comprises:

(a) cash (as well as certificates of deposit or comparable instruments issued by the Reporting Bank) on deposit with the Reporting Bank which is incurring the counterparty exposure;[88,89]

(b) gold;

(c) any debt security:

(i) with an original maturity of 1 year or less that has a credit quality grade of "4" or better; or

(ii) with an original maturity of more than 1 year that has a credit quality grade of "4" or better if issued by a central government or central bank or a credit quality of "3" or better if issued by any other entity;

(d) any equity security (including convertible bonds) that is included in an index of any securities exchange in Singapore or any recognised group A exchange as set out in Table 6 of the Fourth Schedule to the Securities and Futures (Margin and Financial Requirements for Holders of Capital Markets Services License) Regulations; and

(e) any collective investment scheme where —

(i) a price for the units is publicly quoted daily; and

(ii) at least 90% of the deposited property of the collective investment scheme is invested in the instruments listed in this paragraph.[90]

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[88] Cash-funded credit-linked notes issued by a Reporting Bank against exposures in the banking book which fulfil the criteria for eligible credit derivatives may be treated as cash collateralised transactions.

[89] This includes cash on deposit, certificates of deposit or comparable instruments issued by the lending Reporting Bank that are held as collateral at a third-party banking institution in a non-custodial arrangement and that are openly pledged/assigned to the lending Reporting Bank. This is subject to the pledge/assignment being unconditional and irrevocable. Under the FC(SA), the risk weight to be applied to the exposure covered by such collateral shall be the risk weight of the third-party banking institution.

1.2 For a Reporting Bank using the FC(CA), eligible financial collateral comprises:

(a) any instrument listed in paragraph 1.1 above;

(b) any equity security (including convertible bonds) that is listed on any securities exchange in Singapore or any recognised group A exchange as set out in Table 6 of the Fourth Schedule to the Securities and Futures (Margin and Financial Requirements for Holders of Capital Markets Services License) Regulations; and

(c) any collective investment scheme:

(i) authorised by the Authority pursuant to section 286 of the Securities and Futures Act (Cap 289); or

(ii) for which a price for the units is publicly quoted daily and at least 90% of the deposited property of the collective investment scheme is invested in instruments listed in paragraph 1.1 and in this paragraph.[91]

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[90] The use or potential use by a collective investment scheme of derivative instruments solely to hedge investments listed in paragraph 1 shall not prevent units in that collective investment scheme from being recognised as eligible financial collateral for a Reporting Bank using FC(SA).

[91] The use or potential use by a collective investment scheme of derivative instruments solely to hedge investments listed in this Annex shall not prevent units in that collective investment scheme from being recognised as eligible financial collateral for a Reporting Bank using FC(CA).

Annex 7E

CREDIT RISK MITIGATION UNDER SA(CR) AND IRBA

Section 1: Guidelines

1.1 While a Reporting Bank may reduce or transfer credit risk by using credit risk mitigation techniques, the use of such techniques may simultaneously increase other risks (residual risks). Residual risks include legal, operational, liquidity and market risks. Therefore, a Reporting Bank should employ robust methods to control these risks, including—

(a) strategy;[92]

(b) consideration of the underlying credit;[93]

(c) valuation;[94]

(d) policies and procedures;[95]

(e) systems;[96]

(f) control of roll-off risks;[97] and

(g) management of concentration risk arising from the use of credit risk mitigation techniques and the interaction of such concentration risk with the overall credit risk profile of the Reporting Bank.[98]

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[92] **Guideline**: A clearly articulated strategy for the use of credit risk mitigation techniques should form an intrinsic part of the general credit strategy of a Reporting Bank.

[93] **Guideline**: Where an exposure is collateralised, credit managers should continue to assess the exposure on the basis of the obligor's creditworthiness. Credit managers should obtain and analyse sufficient financial information to determine the obligor's risk profile and its management and operational capabilities.

[94] **Guideline**: Collateral should be revalued frequently, and the unsecured exposure should also be monitored frequently. More frequent revaluation is more prudent, and the revaluation of marketable securities should preferably occur on at least a daily basis. Furthermore, stressed and unstressed measures of the potential unsecured exposure under collateralised transactions should be calculated. One such measure would take account of the time and cost involved if the obligor/counterparty were to default and the collateral had to be liquidated. Furthermore, the setting of limits for collateralised counterparties should take account of the potential unsecured exposure. Stress tests and scenario analysis should be conducted to enable the Reporting Bank to understand the behaviour of its portfolio of collateral arrangements under unusual market conditions. Any unusual or disproportionate risk identified should be managed and controlled.

[95] **Guideline**: Clear policies and procedures should be established in respect of collateral management, including: the terms of collateral agreements; types of collateral and enforcement of collateral terms (e.g. waivers of posting deadlines); the management of legal risks; the administration of agreement (e.g. detailed plans for determining default and liquidating collateral); and the prompt resolution of disputes, such as valuation of collateral or positions, acceptability of collateral, fulfilment of legal obligations and the interpretation of contract terms.

[96] **Guideline**: The policies and procedures under paragraph 1(d) should be supported by collateral management systems capable of tracking the location and status of posted collateral (including re-hypothecated collateral), outstanding collateral calls and settlement problems.

[97] **Guideline**: Where a Reporting Bank obtains credit protection that differs in maturity from the underlying credit exposure, the Reporting Bank should monitor and control its roll-off risks, i.e., the fact that the Reporting Bank will be fully exposed when the protection expires, and the risk that it will be unable to purchase credit protection or ensure its capital adequacy when the credit protection expires.

[98] **Guideline**: Taking as collateral large quantities of instruments issued by one obligor creates concentration risk. A Reporting Bank should have a clearly defined policy with respect to the amount of concentration risk it is prepared to run. Such a policy might, for example, include a cap on the amount of collateral it would be prepared to take from a particular issuer or market. The Reporting

1.2 The Authority will consider the robustness of such procedures and processes in its supervisory review of the Reporting Bank under Pillar 2.

Section 2: Requirements

2.1 A Reporting Bank shall not be required to maintain more capital for a transaction in which one or more credit risk mitigation techniques are used than for an otherwise identical transaction where such techniques are not used. A Reporting Bank may choose not to recognise the effects of credit risk mitigation techniques if doing so would result in a higher capital requirement.

2.2 A Reporting Bank shall not obtain capital relief for the use of any credit risk mitigation technique unless all documentation relating to that credit risk mitigation technique is binding on all relevant parties and legally enforceable in all relevant jurisdictions.[99]

2.3 Specifically for collateralised transactions, a Reporting Bank shall ensure that:

(a) the legal mechanism by which collateral is pledged or transferred shall confer on the Reporting Bank the right to liquidate or take legal possession of the collateral, in a timely manner, in the event of the default, insolvency or bankruptcy (or one or more otherwise-defined credit events set out in the transaction documentation) of the counterparty (and, where applicable, of the custodian holding the collateral);

(b) the Reporting Bank has taken all steps necessary to fulfill those requirements under the law applicable to the Reporting Bank's interest in the collateral for obtaining and maintaining an enforceable security interest[100] or for exercising a right to net or set off in relation to title transfer collateral;

(c) the credit quality of the counterparty and the value of the collateral do not have a material positive correlation;[101]

(d) it has implemented procedures for the timely liquidation of collateral to ensure that that any legal conditions required for declaring default of counterparty and liquidating the collateral are observed, and that the collateral can be liquidated promptly[102]; and

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Bank should also take collateral and purchased credit protection into account when assessing the potential concentrations in its overall credit profile.

[99] Guideline: A Reporting Bank should conduct sufficient legal review to verify this and have a well-founded legal basis to reach this conclusion, and undertake such further review as necessary to ensure continuing enforceability. There should be sufficient written documentary evidence to adequately support the conclusion drawn and rebut any legal challenge. While a Reporting Bank may use either in-house or external legal counsel, it should consider whether or not in-house counsel opinion is appropriate. An officer of the Reporting Bank who is legally qualified and independent of the parties originating the transaction should review the legal opinion and evidence that he is satisfied that an adequate review has been completed and that he agrees with the conclusions drawn. A record of these reviews should be kept and made available on the Authority's request.

[100] For example, by registering it with a registrar.

[101] For example, securities issued by the counterparty – or by any related group entity – would provide little protection and so would be ineligible.

[102] Guideline: The liquidation process should take not more than a year from the date of default for eligible CRE/RRE and not more than the number of days assumed in calculating collateral haircuts for eligible financial collateral. Collaterals that do not satisfy these criteria should not be recognised

(e) where the collateral is held by a custodian, the Reporting Bank has taken reasonable steps to ensure that the custodian segregates the collateral from its own assets.

2.4 A Reporting Bank shall not obtain capital relief for the use of any credit risk mitigation technique unless it complies with the Pillar 3 requirements concerning credit risk mitigation in Part XII.[103]

2.5 Any Reporting Bank using the SA(CR) to calculate the credit risk-weighted exposure amount for any exposure shall not recognise the effects of credit risk mitigation if such credit risk mitigation is already reflected in the issue-specific external credit assessment of the exposure.

2.6 Where a Reporting Bank uses multiple credit risk mitigation techniques for a single exposure, the Reporting Bank shall sub-divide the exposure into portions covered by each credit risk mitigation technique and shall calculate the credit risk-weighted exposure amount of each portion separately. A Reporting Bank shall apply the same approach where recognising eligible credit protection by a single protection provider with differing maturities.

2.7 Where the residual maturity of the credit risk mitigation is shorter than that of the exposure that it is intended to cover, a Reporting Bank shall not recognise the effects of the credit risk mitigation if the original maturity of the credit risk mitigation is less than one year or the residual maturity of the credit risk mitigation is 3 months or less.

[103] The Authority will consult on the rules and guidelines relating to this topic at a later date.

CALCULATION OF E* FOR COLLATERALISED TRANSACTIONS THAT ARE NOT SUBJECT TO A QUALIFYING BILATERAL NETTING AGREEMENT

1.1 A Reporting Bank using the FC(CA) shall calculate E*, the exposure amount adjusted for eligible financial collateral, for any collateralised transaction other than an OTC derivative transaction that is not subject to a qualifying bilateral netting agreement using the following formula:

$$E^* = \max \{0, [E(1 + H_E) - C(1 - H_C - H_{FX})]\}$$

where:

E^* = the exposure value after risk mitigation

E = current value of the exposure calculated in accordance with Division 2

H_E = haircut appropriate to the exposure

C = the current value of the collateral received[104]

H_C = haircut appropriate to the collateral, or if the collateral is a basket of assets, the weighted sum of the haircuts appropriate to the assets in the basket where each weight is the weight of the asset in the asset in units of currency

H_{FX} = haircut for currency mismatch between the collateral and exposure

1.2 A Reporting Bank using the FC(CA) shall calculate E*, the exposure amount adjusted for eligible financial collateral, for any collateralised OTC derivative transaction that is not subject to a qualifying bilateral netting agreement using the following formula:

$$E^* = RC + \text{add-on} - C(1 - H_C - H_{FX})$$

where:

[104] Where the residual maturity of the collateral is shorter than the residual maturity of the exposure, the Reporting Bank shall substitute P_A calculated in accordance with Annex 7G for $C(1 - H_C - H_{FX})$.

E^* = the exposure value after risk mitigation

RC = the replacement cost of the transaction obtained by marking to market the transaction, subject to a value of zero in the case of negative replacement cost

add-on = the amount for potential future exposure obtained by applying the appropriate credit conversion factor set out in Annex 7L to the notional amount of the OTC derivative transaction

C = the current value of the collateral received[105]

H_C = haircut appropriate to the collateral, or if the collateral is a basket of assets, the weighted sum of the haircuts appropriate to the assets in the basket where each weight is the weight of the asset in the asset in units of currency

H_{FX} = haircut for currency mismatch between the collateral and exposure

1.3 Subject to paragraphs 1.4 and 1.5, a Reporting Bank shall determine H_E, H_C and H_{FX} in accordance with the standard supervisory haircuts in Annex 7H.

1.4 A Reporting Bank may calculate H_E, H_C and H_{FX} using its own internal estimates of market price volatility and foreign exchange volatility ("own-estimate haircuts") in accordance with Annex 7I if it has received supervisory permission from the Authority to use the IMA for calculating Market RWA. If the Reporting Bank chooses to use own-estimate haircuts, it shall do so consistently for all eligible financial collateral and all portfolios, except that it may use the standard supervisory haircuts in Annex 7H for immaterial portfolios subject to approval by the Authority.

1.5 A Reporting Bank may apply a value of zero to H_E and H_C in the case of a qualifying SFT with a core market participant that meets the conditions in Annex 7Q.

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105 Where the residual maturity of the collateral is shorter than the residual maturity of the exposure, the Reporting Bank shall substitute P_A calculated in accordance with Annex 7G for $C(1 - H_C - H_{FX})$.

Annex 7G

MATURITY MISMATCHES

1 A Reporting Bank shall calculate the value of the credit risk mitigation adjusted for any maturity mismatch, P_A, using the following formula:

$$P_A = [P(t-0.25)]/(T-0.25)$$

where

P = value of the credit protection (e.g. collateral amount, guarantee amount) adjusted for any haircuts

t = min (T, residual maturity of the credit risk migitation) expressed in years

T = min (5, residual maturity of the exposure) expressed in years

Annex 7H

STANDARD SUPERVISORY HAIRCUTS

1.1 The standard supervisory haircuts for H_E and H_C (assuming daily mark-to-market, daily remargining and a 10-business day holding period), expressed as decimals are as follows:

Issue rating for debt securities	**Residual Maturity**	**Sovereigns**	**Other issuers**
Debt securities with a credit quality grade or short-term credit quality grade of "1"	≤ 1 year	0.005	0.01
	> 1 year, ≤ 5 years	0.02	0.04
	> 5 years	0.04	0.08
Debt securities with a credit quality grade or short-term credit quality grade of "3" and above	≤ 1 year	0.01	0.02
	> 1 year, ≤ 5 years	0.03	0.06
	> 5 years	0.06	0.12
Debt securities with a credit quality grade of "4" and above	All	0.15	
Equities (including convertible bonds) in an index of a securities exchange in Singapore or a recognised group A exchange as set out in Table 6 of the Fourth Schedule to the Securities and Futures (Margin and Financial Requirements for Holders of Capital Markets Services License) Regulations		0.15	
Equities (including convertible bonds) listed on a securities exchange in Singapore or a recognised group A exchange as set out in Table 6 of the Fourth Schedule to the Securities and Futures (Margin and Financial Requirements for Holders of Capital Markets Services License) Regulations		0.25	
Collective Investment Schemes		0.25 or highest haircut applicable to any security in which the fund can invest, whichever is lower	
Cash in the same currency		0	

1.2 Notwithstanding paragraph 1.1 above, the standard supervisory haircut, H_E, for transactions in which a Reporting Bank lends instruments that do not qualify as

eligible financial collateral (e.g. corporate debt securities with a credit quality of "4" or below) is 0.25.

1.3 The standard supervisory haircut, $H_{FX,}$ for currency risk where exposure and collateral are denominated in different currencies based on a 10-business day holding period and daily mark-to-market is 0.08.

1.4 Where the remargining or revaluation requirements for the eligible financial collateral set out in Annex 7O are not met, the Reporting Bank shall adjust H_E and H_C using the formula in Annex 7O.

Annex 7I

OWN-ESTIMATE HAIRCUTS

Section 1: Requirements for Use of Own-estimate Haircuts

1.1 A Reporting Bank using own-estimate haircuts shall estimate the volatility for each individual instrument that is taken as eligible financial collateral. In estimating such volatility, the Reporting Bank shall not take into account the correlations between unsecured exposures, collateral and exchange rates. Where there are maturity mismatches, the Reporting Bank shall apply Annex 7G.

1.2 A Reporting Bank shall ensure that the model used to estimate volatilities captures all the material risks run by the Reporting Bank.

1.3 In calculating the haircuts using internal estimates of volatilities, a Reporting Bank shall:

(a) use a 99th percentile, one-tailed confidence interval;

(b) use the minimum holding period according to the type of transaction as set out in Annex 7O. Where the Reporting Bank calculates a haircut using a shorter holding period, it shall scale up the haircut to the appropriate holding period by the formula in Annex 7O;[106]

(c) use a historical observation period (i.e., sample period) of at least one year. Where the Reporting Bank uses a weighting scheme or other methods for the historical observation period, the "effective" observation period shall be at least one year (that is, the weighted average time lag of the individual observations shall not be less than 6 months);

[106] Guideline: Notwithstanding the minimum holding periods set out in Annex 7O, a Reporting Bank should: (a) take into account the illiquidity of lower quality assets and should adjust the holding period upwards in cases where such a holding period would be inappropriate given the liquidity of the collateral; and (b) identify where historical data may understate potential volatility, e.g. a pegged currency; and deal with such cases by subjecting the data to stress testing. A Reporting Bank, when considering the market liquidity of an asset, should consider four dimensions: (a) immediacy, which refers to the speed with which a trade of a given size at a given cost is completed; (b) depth, which refers to the maximum size of a trade for any given bid-ask spread; (c) tightness, which refers to the difference between buy and sell prices; and (d) resiliency, which refers to how quickly prices revert to original or fundamental levels after a large transaction. The bank should have experienced persons familiar with the relevant market for the asset to judge the market liquidity of the collateral and determine if the minimum holding period is sufficient for a given collateral. The holding period should be deemed to be insufficient if the value of the collateral would move by more than 1% should if the collateral be were liquidated within the minimum holding period in Annex 7O, taking into account the immediacy, depth, tightness and resiliency of the market. In such a situation, the holding period should be adjusted upwards, such that the collateral can be safely liquidated within the period, without causing a price movement of more than 1% relative to the value after the haircut.

(d) update its data sets at least once every 3 months and recalculate haircuts at least once every 3 months. The Authority may require more frequent updates whenever there is an increase in volatility in market prices of the collateral[107]; and

(e) use the estimated volatility data in the day-to-day risk management process of the Reporting Bank and if the Reporting Bank is using a longer holding period for risk management compared to the ones prescribed in Annex 7O, then the longer holding period should also be applied for the calculation of haircuts.

Section 2: Guidelines on Use of Own-estimate Haircuts

2.1 The Reporting Bank should have robust processes in place for ensuring compliance with documented internal policies, controls and procedures concerning the operation of the risk measurement system to support the use of own-estimate haircuts. The risk measurement system should be used in conjunction with internal exposure limits.

2.2 The Reporting Bank's risk management processes surrounding the use of own-estimate haircuts should be subject to internal audited at least once a year, covering the following areas:

(a) the integration of risk measures into daily risk management;

(b) the validation of any significant change in the risk management process;

(c) the accuracy and completeness of position data;

(d) the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and

(e) the accuracy and appropriateness of volatility assumptions.

2.3 A Reporting Bank should not confuse such internal audits with an internal validation of the risk management systems surrounding the use of own-estimate haircuts. All significant risk models employed to support the use of own-estimate

[107] Guideline: A Reporting Bank should aim to update its data sets daily in line with industry practice. If the Reporting Bank updates its data sets less frequently (up to the maximum of 3 months), it should be able to demonstrate to the Authority that the volatilities of the market prices are stable. In addition, where the updating of data sets is less frequent, the Authority will normally expect compensating controls in the form of stress testing.

haircuts should be validated periodically, but no less than once a year. The internal audits serve as an independent process check to help ensure that the validation is sufficiently robust and effective.

Annex 7J

CORE MARKET PARTICIPANTS

1.1 Core market participants include:

(a) any central government or central bank;

(b) any public sector entity;

(c) any MDB listed in Annex 7R;

(d) any banking institution;

(e) any financial institution eligible for 20% risk weight under the SA(CR); and

(f) any recognised clearing organisation.

Annex 7K

CHARACTERISTICS OF OTC DERIVATIVE TRANSACTIONS AND SECURITIES FINANCING TRANSACTIONS

1.1 The following are characteristics commonly found in qualifying OTC derivative transactions and securities financing transactions:

(a) they generate a current exposure or market value;

(b) they have an associated random future market value based on market variables;

(c) they generate an exchange of payments or an exchange of a financial instrument against payment;

(d) they are undertaken with an identified counterparty against which a unique probability of default can be determined;

(e) collateral may be used to mitigate risk exposure and is inherent in the nature of some transactions;

(f) short-term financing may be a primary objective in that the transactions mostly consist of an exchange of one asset for another for a relatively short period of time, usually for the business purpose of financing. The two sides of the transactions are not the result of separate decisions but form an indivisible whole to accomplish a defined objective;

(g) netting may be used to mitigate the risk;

(h) positions are frequently valued (most commonly on a daily basis), according to market variables; and

(i) remargining may be employed.

Annex 7L

CREDIT CONVERSION FACTORS TABLE FOR DETERMINING POTENTIAL FUTURE EXPOSURE FOR OTC DERIVATIVE TRANSACTIONS

	Off-balance sheet items[108]	**One year or less**	**Over one year to five years**	**Over five years**
(a)	Foreign Exchange Rate contracts and Gold[109]	1.0 %	5.0%	7.5%
(b)	Interest Rates contracts	0.0 %	0.5%	1.5%
(c)	Equity contracts	6.0 %	8.0%	10.0%
(d)	Precious metals (except gold)	7.0 %	7.0%	8.0%
(e)	Other commodities	10.0 %	12.0%	15.0%

(f)	Credit derivatives	Protection buyer	Protection seller
	Total Return Swap		
	"Qualifying" reference obligation	5%	5%
	"Non-qualifying" reference obligation	10%	10%
	Credit Default Swap		
	"Qualifying" reference obligation	5%	5%[110]
	"Non-qualifying" reference obligation	10%	10%[3]

1.1 For transactions with multiple exchanges of principal, the credit conversion factors are to be multiplied by the number of remaining payments in the contract.

1.2 For transactions structured to settle outstanding exposure following specified payment dates and where the terms are reset such that the market value of the contract is zero on these specified dates, the residual maturity would be equal to the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year that meet the above criteria, the add-on factor is subject to a floor of 0.5%.

1.3 No potential future credit exposure would be calculated for single currency floating/floating interest rate swaps. The credit exposure on these contracts would be evaluated solely on the basis of their carrying value (positive marked-to-market value of derivative contracts).

1.4 Other commodities include forwards, swaps, purchased options and other similar derivatives contracts which are not classified in (a) to (d).

1.5 "Qualifying" reference obligations include securities issued by:

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108 Instruments traded on a securities exchange in Singapore or a recognised group A exchange as set out in Table 6 of the Fourth Schedule to the Securities and Futures (Margin and Financial Requirements for Holders of Capital Markets Services License) Regulations which are i) subject to daily margining requirements and ii) included under the calculation of credit RWA for on-balance sheet banking book positions are exempted.

109 Foreign exchange derivative contracts of less than 14 days in original maturity may be excluded.

110 The protection seller of a credit default swap shall only be subject to the add-on factor where it is subject to closeout upon the insolvency of the protection buyer while the underlying is still insolvent. The add-on should be capped to the amount of unpaid premiums.

(a) any PSE; or

(b) any other issuer that has a credit quality grade of “3” or above as set out in Annex 7T based on the external credit assessments of at least 2 eligible ECAIs.

Annex 7M

CALCULATION OF E* FOR COLLATERALISED TRANSACTIONS THAT ARE SUBJECT TO A QUALIFYING BILATERAL NETTING AGREEMENT

Section 1: SFTs

1.1 The portfolio exposure to a counterparty after adjustment for eligible financial collateral for SFTs subject to a qualifying bilateral netting agreement shall be calculated as the difference between the sum of exposures and the sum of eligible financial collateral received plus an add-on for potential volatility as follows:

$$E^* = \max\{0,[\ \Sigma(E) - \Sigma(C) + \text{add-on}]\}$$

where

E = current mark-to-market value of the exposure to the counterparty

C = the mark-to-market value of the collateral received from the counterparty

1.2 A Reporting Bank shall calculate the add-on either:

(a) as the net long or short position of each security included in the netting agreement multiplied by the appropriate haircut and the net long or short position in each foreign currency arising from the securities as follows:

$$\Sigma((E_S)(H_S)) + \Sigma((E_{FX})(H_{FX}))$$

where

E_S = absolute value of the net position in a given security

H_S = haircut appropriate to E_S

E_{FX} = absolute value of the net position in a currency different form the settlement currency

H_{FX} = haircut appropriate for currency mismatch; or

(b) using a VaR models approach as set out in Annex 7N, provided it has received supervisory permission from the Authority to use the IMA for calculating Market RWA.

1.3 A Reporting Bank using the approach in paragraph 1.2(a) shall not use the approach in paragraph 1.2(b) and vice versa.

Section 2: OTC Derivative Transactions

2.1 A Reporting Bank shall calculate pre-settlement counterparty exposure on OTC derivative transactions subject to a qualifying bilateral netting agreement as the sum of the net mark-to-market replacement cost, if positive, plus an add-on, A_{NET}, based on the notional underlying principal as follows:

$$E_{NET} = RC + A_{NET}$$

2.2 The add-on, A_{NET}, shall be equal to the weighted average of the gross add-on, A_{GROSS}, and the gross add-on adjusted by the ratio of net current replacement cost to gross current replacement cost, NGR, as follows:

$$A_{NET} = 0.4*A_{GROSS} + 0.6*NGR*A_{GROSS}$$

where

A_{GROSS} = sum of individual add-on amounts (calculated by multiplying the notional principal amount by the appropriate add-on factors set out in Annex 7L) of all transactions subject to qualifying bilateral netting agreements with one counterparty

NGR = (level of net replacement cost)/(level of gross replacement cost for transactions subject to qualifying bilateral netting agreements with one counterparty)

2.3 For the purposes of calculating potential future credit exposure to a netting counterparty for forward exchange contracts and other similar contracts in which the notional principal is equivalent to cash flows, notional principal is defined as the net receipts due on each value date in each currency.

2.4 A Reporting Bank may recognise the effect of eligible financial collateral posted in connection with OTC derivative transactions subject to qualifying bilateral netting agreements as follows:

$$E^* = RC + A_{NET} - C(1 - H_C - H_{FX})$$

where

H_C = haircut appropriate to the collateral, or if the collateral is a basket of assets, the weighted sum of the haircuts appropriate the assets in the basket where each weight is the weight of the asset in the asset in units of currency

H_{FX} = haircut appropriate for currency mismatch between the collateral and exposure

2.5 The haircut for currency risk, H_{FX}, should be applied when there is a mismatch between the collateral currency and the settlement currency in accordance with Annex 7H, or in the case of a Reporting Bank using own-estimate haircuts in accordance with Annex 7I. Where there are more than two currencies involved in the exposure, a single haircut assuming a 10-business day holding period scaled up as necessary according to Annex 7O depending on the frequency of mark-to-market shall be applied.

Section 3: Calculation of H

3.1 Subject to paragraphs 3.2 and 3.3, a Reporting Bank shall determine H_S, H_C and H_{FX} in accordance with the standard supervisory haircuts in Annex 7H for the purposes of Sections 1 and 2 above.

3.2 A Reporting Bank may calculate H_S, H_C and H_{FX} using its own internal estimates of market price volatility and foreign exchange volatility ("own-estimate haircuts") in accordance with Annex 7I if it has received supervisory permission from the Authority to use the IMA for calculating Market RWA. If the Reporting Bank chooses to use own-estimate haircuts, it shall do so consistently for all eligible financial collateral and all portfolios, except that it may use the standard supervisory haircuts in Annex 7H for immaterial portfolios subject to approval by the Authority.

3.3 A Reporting Bank may apply a value of zero to H_E and H_C in the case of a qualifying SFT with a core market participant that meets the conditions in Annex 7Q.

Annex 7N

REQUIREMENTS FOR USE OF VAR MODELS

1.1 A Reporting Bank using a VaR model—

(a) shall use a minimum holding period of 10-business days except in the case of repurchase transactions, for which it shall use a minimum holding period of 5-business days.[111]

(b) shall backtest its output by—

(i) identifying a sample of of 20 counterparties, on an annual basis, which shall include the 10 largest counterparties as determined by the bank according to its own exposure measurement approach and 10 others selected at random;

(ii) comparing, for each day and for the sample of 20 counterparties, the previous day's VaR estimate for the counterparty portfolio to the difference between the net value of the previous day's portfolio using today's market prices and the net value of that portfolio using the previous day's market prices; and

(iii) counting an exception, where this difference exceeds the previous day's VaR estimate.

(c) shall calculate the add-on for the purposes of paragraph 1.2(b) of Annex 7M as follows:

Add-on = (VaR output)(VaR multiplier),

where the VaR multiplier is determined by the number of exceptions in the observations for a sample of 20 counterparties over the most recent 250 days (encompassing 5,000 observations) using the table below[112]:

Zone	Number of exceptions	Multiplier
	0-19	1

[111] Guideline: A Reporing Bank should adjust the minimum holding period upwards for market instruments where the specified holding period would be inappropriate given the liquidity of the instrument concerned.

[112] Guideline: When the outcome of the model consistently results in a large number of exceptions, either overall or for one significant counterparty, the Reporting Bank is expected to review the model assumptions and make modifications as appropriate.

Green	20-39	1
	40-59	1
	60-79	1
	80-99	1
Yellow	100-119	1.13
	120-139	1.17
	140-159	1.22
	160-179	1.25
	180-199	1.28
Red	200 or more	1.33

Annex 7O

MINIMUM HOLDING PERIODS AND REVALUATION CONDITIONS

1.1 The following table sets out the minimum holding periods for different types of transactions:

Table I-1: Minimum Holding Periods

Transaction type	**Minimum holding period**	**Re-margining/Revaluation Condition**
Repurchase transactions and securities or commodities lending or borrowing transactions	5 business days	daily re-margining
OTC derivatives transactions and margin lending	10 business days	daily re-margining
Exposures secured by eligible financial collateral	20 business days	daily revaluation

1.2 When the assumed minimum holding period or remargining/revaluation conditions are not fulfilled, a Reporting Bank shall calculate the applicable haircut using the following formula:

$$H = H_M \sqrt{\{[N_R + (T_M - 1)]/ T_M\}}$$

where:

H = haircut

H_M = haircut under the minimum holding period

T_M = minimum holding period for the type of transaction

N_R = actual number of business days between re-margining for capital market transactions or revaluation for secured transactions as the case may be.

1.3 When a Reporting Bank calculates the volatility on a holding period, T_N, which is different from the specified minimum holding period, T_M, the Reporting Bank shall calculate H_M using the following formula:

$H_M = H_N\sqrt{(T_M/T_N)}$

where:

T_N = holding period used by the Reporting Bank for deriving H_N

H_N = haircut based on the holding period T_N

Annex 7P

REQUIREMENTS FOR QUALIFYING BILATERAL NETTING AGREEMENTS

[The Authority is currently reviewing the feedback received from a recent consultation relating to proposed guidance on the recognition of bilateral netting agreements for regulatory capital purposes, and will be issuing the finalised guidance in due course. This guidance will be incorporated in this Annex.]

Annex 7Q

QUALIFYING SFTs

1.1 A qualifying SFT shall comply with the following conditions:

(a) both the exposure and the collateral are cash, or a sovereign or PSE security qualifying for a 0% risk weight in the SA(CR);[113]

(b) both the exposure and the collateral are denominated in the same currency;

(c) either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily re-margining;

(d) following a counterparty's failure to re-margin, the time that is required between the last mark-to-market before the failure to re-margin and the liquidation[114] of the collateral is considered to be no more than four business days;

(e) the transaction is settled across a recognised settlement system for that type of transaction;

(f) the documentation covering the agreement is standard market documentation for repurchase transactions in the securities concerned;

(g) the transaction is governed by documentation specifying that if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin or otherwise defaults, then the transaction is immediately terminable; and

(h) upon any default event, regardless of whether the counterparty is insolvent or bankrupt, the Reporting Bank has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for the benefit of the Reporting Bank.

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[113] Note that where a supervisor has designated domestic-currency claims on its sovereign or central bank to be eligible for a 0% risk weight in the SA(CR), such claims will satisfy this condition.
[114] This does not require the bank to always liquidate the collateral but rather to have the capability to do so within the given time frame.

Annex 7R

QUALIFYING MDBs

1.1 Qualifying MDBs include the following:

(a) the World Bank Group, including the International Bakn for Reconstruction and Development and the International Finance Corporation;

(b) the Asian Development Bank;

(c) the African Development Bank;

(d) the European Bank for Reconstruction and Development;

(e) the Inter-American Development Bank;

(f) the European Investment Bank;

(g) the European Investment Fund;

(h) the Nordic Investment Bank;

(i) the Caribbean Development Bank;

(j) the Islamic Development Bank; and

(k) the Council of Europe Development Bank.

Annex 7S

SPECIFIC TYPES OF GUARANTEES AND CREDIT DERIVATIVES

Proportional Cover

1.1 Where the amount guaranteed, or against which the eligible credit protection is held, is less than the amount of the exposure, and the protected and unprotected portions are of equal seniority, i.e. the bank and the eligible credit protection provider share losses on a pro-rata basis, a Reporting Bank may recognise the eligible credit protection only on a proportional basis, i.e., by applying to the protection portion of the exposure the treatment applicable to eligible guarantees/credit derivatives, and by treating the remainder of the exposure as unprotected.

Principal-only Cover

1.2 Where a Reporting Bank recognises an eligible principal-only credit protection, it shall treat interests and other uncovered payments as part of the unprotected portion.

Partially Eligible Credit Derivatives

1.3 Where a Reporting Bank recognises credit protection through a partially eligible credit derivative, it shall treat as the protected portion the lower of: (a) 60% of the amount of the credit derivative; and (b) 60% of the amount of the underlying obligation.

Tranched cover

1.4 Where a Reporting Bank transfers a portion of the risk of an exposure in one or more tranches to a protection seller or sellers and retains some level of risk of the exposure and the risk transferred and the risk retained are of different seniority, it may obtain credit protection for either the senior tranches (e.g. second loss portion) or the junior tranche (e.g. first loss portion). In this case, the rules as set out in Division 6 of Part VII [securitisation framework] will apply. For avoidance of doubt, cash funded credit linked notes issued by the bank against exposures in the banking book which fulfil the criteria for credit derivatives will be treated as cash collateralised transactions.

Basket Credit Derivatives

1.5 Where a Reporting Bank recognises credit protection through an eligible first-to-default credit derivative, it shall treat as the protected portion the asset in the basket of reference credits with the lowest risk-weighted amount only if the notional amount of that asset is less than or equal to the notional amount of the credit protection.

1.6 Where a Reporting Bank recognises credit protection through an eligible second-to-default credit derivative—

(a) it shall recognise as the protected portion the asset in the basket of reference credits with the second lowest risk weighted amount only if the bank has also obtained credit protection through a first-to-default credit derivative; or

(b) it shall recognise as the protected portion the asset in the basket of reference credits with the lowest risk-weighted amount? only after one of the reference credits has already defaulted,

provided always that the notional amount of the asset treated as protected is less than or equal to the notional amount of the credit protection.

<u>Currency mismatches</u>

1.7 Where there is a currency mismatch, a reporting bank shall not recognise as the protected portion an amount greater than G_A, where—

$G_A = G*(1-H_{FX})$

where:

G = nominal amount of the credit protection

H_{FX} = haircut appropriate for currency mismatch between the credit protection and underlying obligation based on a 10-business day holding period, assuming daily marking-to-market (see paragraph 8 below)

1.8 A Reporting Bank shall determine H_{FX} in the following manner—

(a) if the Reporting Bank uses supervisory haircuts, H_{FX} is 8%; and

(b) if the Reporting Bank uses own-estimate haircuts, it shall estimate H_{FX} according to Annex 7I.

1.9 If the credit protection is not marked-to-market daily, H_{FX} shall be scaled in accordance with Annex 7O.

Annex 7T

CREDIT QUALITY GRADES AND ELIGIBLE ECAIs

Credit Quality Grade	**1**	**2**	**3**	**4**	**5**	**6**
Fitch Ratings	AAA AA+ AA AA-	A+ A A-	BBB+ BBB BBB-	BB+ BB BB-	B+ B B-	CCC+ CCC CCC- CC C D
Moody’s Investor Services	Aaa Aa1 Aa2 Aa3	A1 A2 A3	Baa1 Baa2 Baa3	Ba1 Ba2 Ba3	B1 B2 B3	Caa1 Caa2 Caa3 Ca C
Standard & Poor’s	AAA AA+ AA AA-	A+ A A-	BBB+ BBB BBB-	BB+ BB BB-	B+ B B-	CCC+ CCC CCC- CC C D

Short-term Credit Quality Grade	**I**	**II**	**III**	**IV**
Fitch Ratings	F-1	F-2	F-3	Others
Moody’s Investor Services	P-1	P-2	P-3	Others
Standard & Poor’s	A-1	A-2	A-3	Others

Annex 7U

IRBA VALIDATION STANDARDS

[The Authority is currently reviewing feedback received from an industry consultation on this Annex and will issue the revised guidance shortly.]

Annex 7V

IRBA ROLLOUT PARAMETERS

[Please refer to Guidelines on IRBA Adoption issued by the Authority in January 2005.]

Annex 7W

IRBA DEFINITION OF DEFAULT

[The Authority is currently reviewing feedback received from an industry consultation on this Annex and will issue the revised guidance shortly.]

Annex 7X

CALCULATION OF EFFECTIVE MATURITY

[The Authority is currently reviewing feedback received from an industry consultation on this Annex and will issue the revised guidance shortly.]

ANNEX 7Y

RULES FOR THE USE OF TOP-DOWN APPROACH FOR QUALIFYING PURCHASED CORPORATE RECEIVABLES

[The Authority is currently reviewing the detailed requirements for the top-down approach and will consult on the proposed guidance at a later date.]

Annex 7Z

DEFINITION OF IRBA PARAMETERS

[The Authority is currently reviewing feedback received from an industry consultation on this Annex and will issue the revised guidance shortly.]

Annex 7AA

MINIMUM EXPECTATIONS ON INFORMATION AND DATA USED FOR DERIVING ESTIMATES OF IRBA PARAMETERS

[The Authority is currently reviewing feedback received from an industry consultation on this Annex and will issue the revised guidance shortly.]

Monetary Authority of Singapore