HONG KONG MONETARY AUTHORITY
香港金融管理局

CONSULTATION PAPERS ON NEW CAPITAL ADEQUACY STANDARDS IN HONG KONG

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Consultation Papers on New Capital Adequacy Standards in Hong Kong

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WEIGHTING FRAMEWORK FOR CREDIT RISK (STANDARDISED APPROACH)

Hong Kong Monetary Authority
February 2005

Weighting Framework for Credit Risk
(Standardised Approach)

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1. Introduction

1.1 Terminology

1.1.1 Abbreviations and other terms used in this paper have the following meanings:

- "CRM" means credit risk mitigation, which refers to techniques AIs use to reduce the credit risk of their exposures;
- "Principal Amount" means the amount of any outstanding claim on, or contingent liability in respect of, the relevant counterparty;
- "Specific provisions" include partial write-offs and cover those set aside for bad and doubtful debts, country risk and depreciation of fixed assets;
- "Weighted Amount" means the credit risk-weighted amount in terms of which the capital requirement for the credit risk of an exposure is measured;
- "CCF" means credit conversion factor, by which the principal amount of an off-balance sheet exposure is multiplied to derive the credit equivalent amount;
- "ECAI" means an external credit assessment institution recognised by the HKMA for capital adequacy purposes;
- "Credit Quality Grade" means a grade represented by the numerals 1, 2, 3, 4, 5 or 6, to which the credit assessment of an ECAI for a credit exposure is mapped for determining the appropriate risk weight for a rated exposure, as described in a paper to be developed on "Recognition of ECAIs";
- "Sovereign" means the central government or the central bank of an economy, or a specified international organisation. "Specified international organisations" include:
  - the Bank for International Settlements;
  - the International Monetary Fund;
  - the European Central Bank;
  - the European Community; and
  - other entities as may be specified by the Monetary Authority from time to time.
- "Domestic Currency Claim" means any claim which is denominated and funded in the currency used domestically in the place in which the obligor is incorporated;

- "PSE" means a public sector entity which is specified as such either by the Monetary Authority ("domestic PSE") or by an overseas banking supervisory authority ("foreign PSE"). Domestic PSEs include:
  - the MTR Corporation Limited;
  - the Kowloon-Canton Railway Corporation;
  - the Hong Kong Housing Authority;
  - the Hospital Authority;
  - the Airport Authority;
  - the Hong Kong Mortgage Corporation Limited;
  - the Urban Renewal Authority;
  - the Hong Kong Link 2004 Limited; and
  - other entities as may be specified by the Monetary Authority from time to time.
- "MDB" means a multilateral development bank, which refers to any bank or lending or development body established by agreement between, or guaranteed by, two or more countries, territories or international organisations other than for purely commercial purposes, as specified by the Monetary Authority under [section 2(19) of the Banking (Amendment) Bill 2005]. These include:
  - the International Bank for Reconstruction and Development;
  - the International Finance Corporation;
  - the Asian Development Bank;
  - the African Development Bank;
  - the European Bank for Reconstruction and Development;
  - the Inter-American Development Bank;
  - the European Investment Bank;
  - the European Investment Fund;
  - the Nordic Investment Bank;
  - the Caribbean Development Bank;
  - the Islamic Development Bank;
  - the Council of Europe Development Bank; and
  - other entities as may be specified by the Monetary Authority from time to time.

- "Bank" means:

  (i) any AI (other than any AI the authorization of which is for the time being suspended under section 24 or 25 of the Banking Ordinance); and

  (ii) any bank incorporated outside Hong Kong which is not an AI, except such a bank which:

  – in the opinion of the Monetary Authority, is not adequately supervised by the relevant banking supervisory authority; or

  – the licence or other authorization of which to carry on banking business is for the time being suspended.

- "Securities firm" means any entity licensed and supervised by relevant securities regulators. Entities should be subject to supervisory arrangements comparable to those under Basel II including, in particular, risk-based capital requirements. Domestically, these include all licensed corporations that have registered with the Securities and Futures Commission of Hong Kong.

- "Corporate" refers to any proprietorship, partnership or limited company that is neither a PSE, bank, securities firm, nor borrower within the definition of regulatory retail exposures (see paragraph 4.1.2). For capital adequacy purposes, the term also includes insurance companies.

- "Past due" is a term used to describe any exposure that is overdue for more than 90 days or rescheduled. Please refer to paragraph 4.1.12 for details.

1.2 Scope and Application

1.2.1 This paper sets out the weighting framework to be adopted by an AI to quantify its credit risk for calculating the capital adequacy ratio under the Standardised Approach.

1.2.2 A locally incorporated AI is expected to use the Standardised Approach unless it is approved by the HKMA to adopt either the Basic Approach or the Internal Ratings-based ("IRB") Approach. The qualifying criteria for the use of the two approaches are spelt out respectively in the papers on "Basic Approach" (to be developed), "Minimum Requirements for Internal Rating System under IRB Approach" and "Minimum Requirements for Risk Quantification under IRB Approach".

1.2.3 Under the Standardised Approach, different categories of on-balance sheet or off-balance sheet exposures of an AI are to be risk-weighted according to the ratings assigned by ECAIs, where available and applicable, or the risk weights assigned by the HKMA based on certain standard characteristics of the exposure (such as nature of exposure, repayment status, etc).

1.2.4 The requirements set out in this paper apply to all credit exposures of an AI (except those mentioned in paragraph 1.2.5) including the credit exposures arising from all on-balance sheet and off-balance sheet transactions in its banking book, the counterparty exposures arising from OTC derivatives transactions in its trading book, and, under certain circumstances, repo-style transactions (see section 7 for details).

1.2.5 Credit exposures related to securities and derivatives in the trading book (i.e. other than counterparty exposures) are generally captured as part of an AI's market risk exposures (for which the capital treatment will be set out in a paper on "The revised capital treatment of market risk exposures"). Those arising from asset securitisation will be dealt with in a separate paper which is being developed.

1.2.6 This paper should be read in conjunction with the paper on "Credit Risk Mitigation under the Standardised Approach", which forms an integral part of the framework for determining the weighted amount of credit exposures under the Standardised Approach.

2. Measurement methodology

2.1 Standard portfolios for risk-weighting

2.1.1 For the purpose of risk-weighting under the Standardised Approach, credit exposures should first be categorised into the following 11 standard portfolios.

(a) Claims on sovereigns

(b) Claims on public sector entities

(c) Claims on multilateral development banks

(d) Claims on banks

(e) Claims on securities firms

(f) Claims on corporates

(g) Cash items

(h) Regulatory retail exposures

(i) Residential mortgage loans

(j) Past due exposures

(k) Other exposures

2.1.2 These 11 standardised portfolios are mutually exclusive and therefore any given exposure should be categorised only under one of them. For instance, any exposures which are past due should only be categorised under portfolio (j). No past due exposures should be categorised under other portfolios. Each of the portfolios has its own risk-weighting scale. The risk weight for an exposure under portfolios (a) to (f) is based on credit assessments of ECAIs. These are discussed in detail under section 3. The risk weight for an exposure under portfolios (g) to (k) is assigned based on certain standard characteristics of the exposures (such as the nature of borrower, repayment status, etc). These are discussed in detail under section 4.

2.2 Credit risk mitigation

2.2.1 AIs may use CRM techniques to reduce credit risk to which they are exposed. CRM techniques that are recognised for capital adequacy purposes are collateral, guarantees and credit derivatives, and netting. Providing the relevant qualifying criteria are met, the weighted amount of a credit exposure supported by any of these techniques can be reduced.

2.2.2 Details of the criteria for the recognition of these CRM techniques and the extent to which each of these techniques can reduce the capital requirement of a credit exposure are provided in the paper on "Credit Risk Mitigation under the Standardised Approach".

2.3 Calculation of risk-weighted amount

2.3.1 The credit risk of any exposure for which an AI has to set aside regulatory capital is measured in terms of the Weighted Amount of the exposure.

2.3.2 For each on-balance sheet credit exposure, the Weighted Amount is calculated by multiplying the Principal Amount, net of specific provisions, if any, with the applicable risk weight. For an exposure covered by eligible CRM techniques, the Weighted Amount of the exposure can be reduced based on the treatment described in the paper on "Credit Risk Mitigation under the Standardised Approach".

2.3.3 For each off-balance sheet exposure, the Weighted Amount is calculated based on the Credit Equivalent Amount of the exposure, which is determined according to the requirements set out in subsection 6.1. The Credit

Equivalent Amount is then multiplied by the applicable risk weight to arrive at the Weighted Amount for the exposure.

3. Risk weights based on external credit assessment

3.1 Introduction

3.1.1 Where the risk weights are determined by external credit assessments, AIs should use those assigned on a solicited basis by institutions that are recognised by the HKMA (i.e. ECAIs). Recognition criteria, approval process [and the list of ECAIs] are set out in the paper to be developed on "Recognition of ECAIs".

3.1.2 For each of the relevant portfolios, risk weights are mapped to a scale of uniform Credit Quality Grades represented by the numerals of 1 to 5 or 6. The scale is to provide a common platform into which different notations used by different ECAIs (such as AA+ of Standard & Poor's, Aaa of Moody's and AA+ of Fitch) can be mapped. In addition, specific risk weights are assigned to unrated exposures under each of the portfolios. Also, there is a separate scale for risk-weighting rated short-term paper issued by banks and corporates. AIs should refer to the paper on "Recognition of ECAIs" for mapping of different sets of notations used by individual ECAIs into the Credit Quality Grades. For illustration, **Annex A** is a set of tables summarising how the notations used by Moody's, Standard & Poor's and Fitch are mapped to the uniform Credit Quality Grades.

3.2 The risk weights for individual claims

3.2.1 The following explains how exposures categorised in portfolios (a) to (f) should be risk-weighted based on their Credit Quality Grades and other relevant considerations.

(a) Claims on Sovereigns

3.2.2 Subject to paragraph 3.2.4, claims on sovereigns should be risk-weighted as follows:

Credit Quality Grade (Sovereigns)	1	2	3	4	5	6	Unrated
Risk weight	0%	20%	50%	100%	100%	150%	100%

3.2.3 Domestic currency claims on the HKSAR Government and the Exchange Fund will receive a 0% risk weight.

3.2.4 Where an overseas national supervisor allows its banks to apply a lower risk weight to domestic currency claims

on its sovereign, AIs may also apply the same lower risk weight to such domestic currency exposures to the sovereign of the supervisor.

3.2.5 Claims on "specified international organisations" will receive a 0% risk weight.

(b) Claims on public sector entities

3.2.6 Claims on domestic PSEs should be assigned a risk weight that is one category less favorable than that assigned to the HKSAR Government. Presently, this will mean a risk weight of 20% for domestic currency claims (given that HKD debts of the HKSAR are assigned a 0% risk weight) and 50% for foreign currency claims (given that foreign currency claims on the HKSAR presently have a Credit Quality Grade of "2", which corresponds to a 20% risk weight).

3.2.7 Claims on foreign PSEs are treated as claims on sovereigns only if they are so regarded by national supervisors in their jurisdictions. Otherwise, the claims should, similar to the treatment of claims on domestic PSEs, be assigned a risk weight that is one category less favourable than that assigned to their sovereign of incorporation, but capped at 100%.

(c) Claims on multilateral development banks

3.2.8 Claims on MDBs should be risk-weighted at 0%.

(d) Claims on banks

3.2.9 Two risk-weighting scales are available for claims on banks, one for long-term claims and another one for short-term claims:

Credit Quality Grade (Banks)	1	2	3	4	5	Unrated
Risk weight for long-term claims	20%	50%	50%	100%	150%	50%
Risk weight for short-term claims	20%	20%	20%	50%	150%	20%

3.2.10 Short-term claims on banks refer to claims which have an original maturity of three months or less and are not expected to be rolled over. No claim on an unrated bank may receive a risk weight lower than that applied to claims on its sovereign of incorporation.

(e) Claims on securities firms

3.2.11 Claims on securities firms should be risk-weighted as claims on banks but without the preferential treatment for short-term claims.

(f) Claims on corporates

3.2.12 Claims on corporates should be risk-weighted as follows:

Credit Quality Grade (Corporates)	1	2	3	4	5	Unrated
Risk weight	20%	50%	100%	100%	150%	100%

3.2.13 No claim on an unrated corporate should be given a risk weight lower than that assigned to its sovereign of incorporation.

3.3 Short-term claims

3.3.1 Subject to the conditions set out in paragraphs B.8 to B.10 of **Annex B**, short-term external credit assessments may be used to risk-weight short-term claims on corporates and banks. The table below sets out the applicable risk weights:

Short-term Credit Quality Grade (Corporates and banks)	1	2	3	4
Risk weight	20%	50%	100%	150%

3.4 Application of external credit assessment

3.4.1 There are a number of general principles that AIs should follow for the selection of the appropriate external credit assessment for risk-weighting a claim. These principles are incorporated at **Annex B** and will give further guidance on:

- which assessment to choose if more than one external assessment are applicable to a claim;
- when to use the assessment of an issuer or that of an issue;
- whether a foreign currency assessment can be used to determine the risk weight of a claim denominated in domestic currency; and
- the use of short-term and long-term assessments.

4. Risk weights based on standard characteristics of exposures

4.1 The risk weights for individual claims

(g) Cash items

4.1.1 The following types of asset are regarded as cash items which, except item (iv), should attract a 0% risk weight:

(i) Notes and coins.

(ii) Holdings of HKSAR Government certificates of indebtedness for note issue.

(iii) All gold bullion held in the AI's own vaults or, on an allocated basis, in the vaults of other institutions to the extent that, in both cases, it is backed by gold bullion liabilities.

(iv) Cheques, drafts and other items drawn on other AIs or banks that are payable immediately upon presentation and that are in the process of collection are subject to a 20% risk weight.

(v) All receivable funds arising from the sale of securities, for the AI's own account or on behalf of a customer, which are outstanding up to and including the fifth working day after the due settlement date.

(vi) All receivable funds arising from the purchase of securities on behalf of a customer, which are outstanding up to and including the fifth working day after the due settlement date.

(h) Regulatory retail exposures

4.1.2 Except those that are past due as defined in portfolio (j) below, claims that meet all of the following three criteria may be categorised as regulatory retail exposures and subject to a 75% preferential risk weight:

(i) **Orientation criterion** – The exposure must be either to an individual person / individual persons or to a small business (see paragraph 4.1.3 for definition).

(ii) **Product criterion** – The exposure must take the form of any of the following: revolving credits and lines of credit (including credit cards and overdrafts); personal term loans and leases (excluding residential mortgage loans ("RMLs") which are risk-weighted according to the criteria under portfolio (i) below); and small business facilities and commitments.

(iii) **Low value of individual exposures** – The maximum aggregate retail exposure to one counterparty or to any group of counterparties that can be considered as a single beneficiary, including any past due claims, must not exceed HKD 10 million. In the case of off-balance sheet exposures, the amount is taken to be the Credit Equivalent Amount determined in accordance with the principles under section 6.

4.1.3 For the purposes of this portfolio, "small business" is taken to mean a "small and medium sized enterprise" ("SME") as defined in the commercial credit reference agency ("CCRA") framework, viz:

(i) An unlisted company with an annual turnover not exceeding HKD 50 million (unless the company belongs to a larger group whose annual turnover is larger than HKD 50 million); or

(ii) An unincorporated enterprise such as a partnership or sole proprietorship with an annual turnover not exceeding HKD 50 million

which has given consent for disclosure of its credit data to the CCRA.

4.1.4 AIs intending to apply the 75% risk weight to claims on SMEs must comply with the standards and requirements of the CRM framework set out under SPM Module IC-7 on "the Sharing and Use of Commercial Credit Data through a Commercial Credit Reference Agency", as well as guidelines and circulars issued by the Industry Associations (i.e. the Hong Kong Association of Banks and the DTC Association).

4.1.5 Claims on small businesses that do not satisfy the criteria for inclusion as regulatory retail exposures or residential mortgage loans as defined under paragraphs 4.1.8 to 4.1.10 should be treated as claims on corporates and subject to a 100% risk weight, given their unrated status.

4.1.6 Claims on individuals that do not satisfy the criteria for inclusion as regulatory retail exposures or residential mortgage loans as defined under paragraphs 4.1.8 and 4.1.10 should be treated as other exposures (see paragraph 4.1.14) and subject to a 100% risk weight.

(i) Residential mortgage loans

4.1.7 RMLs that are performing (i.e. not past due) should be risk-weighted at:

- 35% for eligible loans based on the criteria set out under paragraph 4.1.8;

- 75% for loans that are not eligible for the 35% risk weight but satisfy the criteria set out under paragraph 4.1.10; or
- 100% for other performing loans.

4.1.8 RMLs eligible for the 35% risk weight must satisfy the following criteria:

- The loan is to an individual person / individual persons or to a property-holding shell company where the conditions specified under paragraph 4.1.9 are satisfied;
- The loan to value ("LTV") ratio does not exceed 70% at the time of loan origination for loans secured on residential mortgage properties situated in Hong Kong and thereafter, 100% based on the current loan outstanding and latest value of mortgage property. For loans secured on residential mortgage properties situated outside Hong Kong, the maximum LTV ratio and other qualifying criteria for the concessionary risk weight adopted by the supervisor in that jurisdiction should apply.
- The loan is secured by a first legal charge on the mortgage property; and
- The mortgage property is used as the borrower's residence or as a residence by a tenant of the borrower.

4.1.9 For loans granted to property-holding shell companies to qualify for the 35% risk weight, an additional condition is that their credit risk must be akin to that of loans granted to individuals. This is considered to be the case where:

- the shell company is a residential property-holding company with no other business activities;
- the loan is fully supported by personal guarantees[1] of the directors / shareholders of the company whose repayment ability is adequately assessed, having regard to their other debt obligations; and
- such loans are subject to the same credit underwriting standards applicable to those granted to individuals (e.g. in terms of the loan purpose, LTV ratio, and debt-service ratio etc).

The HKMA will review the above treatment of property-holding shell companies from time to time to see if it

[1] These should satisfy the relevant operational criteria for guarantees set out in the paper on "Credit Risk Mitigation under the Standardised Approach".

continues to be appropriate and reserve the right to revise it in the light of prevailing market conditions.

4.1.10 RMLs that are not eligible for the 35% risk weight but can satisfy the following criteria can be weighted at 75%.

- The loan is to an individual person / individual persons or a small business (as described under paragraph 4.1.2);
- The maximum aggregate exposure to one borrower does not exceed HKD 10 million (as described under paragraph 4.1.2); and
- The LTV ratio does not exceed 90% at the time of loan origination.

4.1.11 In calculating both the original and the current LTV ratios, the portion of a loan granted by a third party developer (in the case of mortgage co-financing schemes) or guaranteed / insured by a guarantor / an insurer acceptable to the HKMA (in the case of mortgage guarantee / insurance schemes) should be excluded. Acceptable guarantors / issuers are taken to mean those with credit assessments by ECAIs at the time of loan origination which map into a risk weight of lower than 35%.

(j) Past due exposures

4.1.12 This portfolio should include any exposures that are overdue for more than 90 days or rescheduled. The manner in which the overdue status and rescheduled status are determined should follow the principles set out in Appendix 2.1 of the completion instructions for Quarterly Return on Loans and Advances and Provisions M(BS)2A, a copy of which is enclosed at **Annex C**.

4.1.13 A risk weight of 150% should be applied to the unsecured portion of a past due exposure, determined by netting the amount of specific provision (including partial write-offs) and the effect of eligible CRM from the gross outstanding amount of the asset. For calculation of the amount of credit protection for different CRM techniques, please refer to the paper on “Credit Risk Mitigation under the Standardised Approach”.

(k) Other exposures

4.1.14 These include all exposures not elsewhere specified, other than those which are deducted in determining the capital base of the AI. Such assets are subject to a 100% risk weight, or a higher risk weight as may be specified by the HKMA, if the asset concerned, other than those that are past due, is considered to be of higher risk.

5. Off-balance sheet exposures

5.1 Introduction

5.1.1 This section sets out the off-balance sheet items (other than those arising from asset securitisation transactions) that should be captured in the capital adequacy framework and the CCF applicable to each of the items for the purpose of determining the Weighted Amount.

5.1.2 For OTC derivative contracts, credit risk for the purpose of this section refers to the risk of the AI's counterparty in a contract being unable to honour its obligation on maturity of the contract (i.e. pre-settlement counterparty risk). This however excludes credit derivative transactions entered into for the purpose of mitigating credit risk of certain underlying credit exposures of the AI, which should follow instead the CRM treatment explained in the paper on "Credit Risk Mitigation under the Standardised Approach".

5.2 Credit conversion factors for off-balance sheet credit risk

5.2.1 The following list gives the CCFs for individual types of off-balance sheet exposures.

(i) Direct credit substitutes

5.2.2 These include guarantees, standby letters of credit serving as financial guarantees for loans, acceptances and financial liabilities arising from the selling of credit derivatives in the form of total return swaps, or credit default swaps booked in the banking book. They are subject to a CCF of 100%.

(ii) Transaction-related contingencies

5.2.3 These include performance bonds, bid bonds, warranties, and standby letters of credit related to particular transactions. They are subject to a CCF of 50%.

(iii) Trade-related contingencies

5.2.4 These include liabilities arising from issuing and confirming letters of credit, acceptances on trade bills, shipping guarantees issued, and any other trade related contingencies. They are subject to a CCF of 20%.

(iv) Asset sales or other transactions with recourse

5.2.5 These refer to transactions of asset sales where the credit risk of the assets sold remains with the AI, as the holder of the asset is entitled to put the asset back to the AI within an agreed period or under certain prescribed circumstances. Such transactions are subject to a CCF of 100%.

(v) Forward asset purchases

5.2.6 These refer to commitments to purchase at a specified future date and on prearranged terms, a loan, security or other asset from another party including commitments under a put option written by the AI and commitments to repurchase securities in repo-style transactions (i.e. repo of securities where the terms of the agreement are such that all risks and rewards of ownership are substantially transferred to the counterparty). These are subject to a CCF of 100%.

(vi) Partly paid shares and securities

5.2.7 These refer to the unpaid portion of partly-paid shares or securities which the issuer may call upon the AI to pay at a predetermined or unspecified date in the future. These are subject to a CCF of 100%.

(vii) Forward forward deposits placed

5.2.8 These refer to any agreement between the AI and another party whereby the AI will place a deposit at an agreed rate of interest with that party at a predetermined future date. Such deposits are subject to a CCF of 100%.

(viii) Note issuance and revolving underwriting facilities

5.2.9 These are arrangements whereby a borrower may draw down funds up to a prescribed limit over a predefined period by making repeated note issues to the market, and where, should the issue prove unable to be placed in the market, the unplaced amount is to be taken up or funds made available by the underwriter of the facility. Such facilities are subject to a CCF of 50%.

(ix) Other commitments

5.2.10 These include the undrawn portion of any binding arrangements which obligate the AI to provide funds at some future date. The CCFs to be applied to these commitments are as follows:

- 20% for commitments with an original maturity of up to one year;
- 50% for those with an original maturity of over one year; and
- 0% for those that are unconditionally cancellable at any time by the bank without prior notice other than for “force majeure” reasons, or that effectively provide for automatic cancellation due to deterioration in a borrower’s creditworthiness.

5.2.11 Original maturity is defined as the length of time between the date the commitment is made and the earliest date on which the AI can, at its option, unconditionally cancel the commitment.

(x) Exchange rate contracts

5.2.12 Exchange rate contracts include cross-currency interest rate swaps, forward foreign exchange contracts, currency futures, currency options purchased and similar instruments. They include also contracts concerning gold. The CCF of a contract is determined by the length of its residual maturity:

- 1 year or less (subject to a CCF of 1%);
- over 1 year to 5 years (subject to a CCF of 5%); and
- over 5 years (subject to a CCF of 7.5%).

(xi) Interest rate contacts

5.2.13 Interest rate contracts include single-currency interest rate swaps, forward rate agreements, interest rate futures, interest rate options purchased and similar instruments. The CCF of a contract is determined by the length of its residual maturity:

- 1 year or less (subject to a CCF of 0%);
- over 1 year to 5 years (subject to a CCF of 0.5%); and
- over 5 years (subject to a CCF of 1.5%).

(xii) Equity contracts

5.2.14 Equity contracts include forwards, swaps, purchased options and similar derivative contracts based on individual equities or on equity indices. The CCF of a contract is determined by the length of its residual maturity:

- 1 year or less (subject to a CCF 6%);
- over 1 year to 5 years (subject to a CCF of 8%); and
- over 5 years (subject to a CCF of 10%).

(xiii) Precious metals other than gold contracts

5.2.15 Precious metals (other than gold) contracts include forwards, swaps, purchased options and similar derivative contracts that are based on precious metals such as silver, platinum and palladium. The CCF of a contract is determined by the length of its residual maturity:

- 1 year or less (subject to a CCF of 7%);

- over 1 year to 5 years (subject to a CCF of 7%); and
- over 5 years (subject to a CCF of 8%).

(xiv) Commodities other than precious metals and gold contracts

5.2.16 Other commodity contracts include forwards, swaps, purchased options and similar derivative contracts based on energy contracts, agricultural contracts, base metals (such as aluminium, copper, and zinc) and any other non-precious metal commodity contracts. The CCF of a contract is determined by the length of its residual maturity:

- 1 year or less (subject to a CCF of 10%);
- over 1 year to 5 years (subject to a CCF of 12%); and
- over 5 years (subject to a CCF of 15%).

(xv) Credit derivatives

5.2.17 Credit derivative contracts refer to Credit Default Swaps and Total Return Swaps booked in the trading book. (Credit derivative contracts booked in the banking book are treated as CRM techniques (for protection buyers) or direct credit substitutes (for protection sellers) mentioned in item (i) above.)

5.2.18 The CCF for each type of these contracts is determined by the role of the AI in a contract (whether as protection buyer or protection seller and whether the reference obligation is "qualifying" or not as defined in the paper on "The revised capital treatment of market risk exposures" to be developed – see paragraph 6.2.11 for details):

Credit Default Swaps

Protection buyer:

- "Qualifying" reference obligation (subject to a CCF of 5%); and
- "Non-qualifying" reference obligation (subject to a CCF of 10%).

Protection seller[2]*:*

- "Qualifying" reference obligation (subject to a CCF of 5%); and
- "Non-qualifying" reference obligation (subject to a CCF of 10%).

[2] The protection seller of a credit default swap shall only be subject to the CCF where it is subject to closeout upon the insolvency of the protection buyer while the underlying is still solvent. Add-on should then be capped to the amount of unpaid premiums.

Total Return Swaps

Protection buyer:

- "Qualifying" reference obligation (subject to a CCF of 5%); and
- "Non-qualifying" reference obligation (subject to a CCF of 10%).

Protection seller:

- "Qualifying" reference obligation (subject to a CCF of 5%); and
- "Non-qualifying" reference obligation (subject to a CCF of 10%).

(xvi) Other off-balance sheet exposures not elsewhere included

5.2.19 Off-balance sheet exposures that are not elsewhere included are subject to a CCF of 100% or a CCF as may be specified by the HKMA.

6. Calculation of risk-weighted amount for off-balance sheet items

6.1 General approach

6.1.1 For each off-balance sheet exposure, the Weighted Amount is calculated based on the Credit Equivalent Amount instead of the Principal Amount of the exposure, by means of a two-step process:

For items other than OTC derivative contracts, viz., items (i) to (ix) and (xvi)

(i) First, the Principal Amount is converted into a Credit Equivalent Amount by multiplying the Principal Amount, net of specific provisions, by the applicable CCF;

(ii) Second, the Credit Equivalent Amount is multiplied by the applicable risk weight to arrive at the Weighted Amount. In general, the applicable risk weights are determined based on the risk weight of the counterparty. The exceptions are items (iv) to (vi), where the risk weights are determined according to the underlying assets or the issuer of the assets rather than the counterparty with whom the transaction has been entered into.

For derivative contracts, viz., items (x) to (xv)

(i) First, the Credit Equivalent Amount is determined by the summation of the current exposure and the potential exposure calculated in accordance with subsection 6.2. Specific provisions, if any, should

then be deducted from the Credit Equivalent Amount;

(ii) Second, the Credit Equivalent Amount, net of specific provisions, if any, is multiplied by the applicable risk weight(s) to arrive at the Weighted Amount.

For exposures covered by eligible CRM techniques, the Weighted Amount can be reduced based on the treatments described in the paper on "Credit Risk Mitigation under the Standardised Approach".

6.1.2 For derivative transactions, exemption from capital requirements will however be permitted for:

(i) instruments traded on an exchange or margin trading transactions which are subject to daily margining requirements;

(ii) exchange rate contracts (except those concerning gold) which have an original maturity of 14 calendar days or less; or

(iii) forward exchange rate contracts arising from swap deposit arrangements.

6.2 The current exposure method

6.2.1 AIs should use the current exposure method to weight OTC derivative contracts (see paragraphs 6.2.2 to 6.2.11).

6.2.2 Under the current exposure method , AIs are required to calculate the Credit Equivalent Amount of each derivative contract, which should be the sum of the following:

(i) **current exposure**, which is the replacement cost (obtained by "marking to market") of every contract that has a positive value (where a contract has a negative value, its current exposure should be taken as zero); and

(ii) **potential exposure** (the add-on), which is derived by multiplying the Principal Amount of the contract by the applicable CCF.

6.2.3 The CCFs applicable to derivative contracts of different residual maturities are shown in the following table:

Residual Maturity	Exchange Rate and Gold	Interest Rate	Equity	Precious Metals (Except Gold)	Other Commod -ities
1 year or less	1.0%	Nil	6.0%	7.0%	10.0%
Over 1 year to 5 years	5.0%	0.5%	8.0%	7.0%	12.0%
Over 5 years	7.5%	1.5%	10.0%	8.0%	15.0%

6.2.4 For contracts with multiple exchanges of principal, the CCFs are to be multiplied by the number of remaining payments in the contract.

6.2.5 For contracts 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 dates, the residual maturity should be set equal to the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year that meet these criteria, the CCF is subject to a floor of 0.5%.

6.2.6 It is not necessary to calculate the potential exposure of single currency floating / floating interest rate swaps. The current exposures, i.e. replacement cost, of these contracts should be taken as their Credit Equivalent Amounts.

6.2.7 OTC derivative contracts other than those concerning exchange rate and gold, interest rate, equity, precious metals, or credit derivative transactions in the trading book (see paragraph 6.2.9), should be treated as “other commodities”.

6.2.8 For all contracts, calculation of the add-on should be based on the effective notional amount which reflects the actual risk inherent in the contract. For instance, where the contract provides for the multiplication of cash-flows, as in leveraged derivatives, the notional amount should be adjusted to take into account the effect this has on the risk structure.

6.2.9 For credit derivative transactions in the trading book, the CCFs to be applied for the calculation of potential exposure for single name transactions are set out below:

	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%
"Non-qualifying" reference obligation	10%	10%

6.2.10 As shown, the CCFs for credit derivative transactions do not depend on the residual maturity of the contracts. For the exposure of a protection seller under a credit default swap, the specified CCFs should only be applied where the contract is subject to closeout upon the insolvency of the protection buyer while the underlying is still solvent. The add-on should then be capped to the amount of unpaid premiums.

6.2.11 The definition of "qualifying" is the same as for the "qualifying" category for the treatment of specific risk under the standardised measurement method described in the market risk framework. Where the credit derivative is a first-to-default transaction linked to a basket of items, the CCF will be determined based on the item with the lowest credit quality in the basket, i.e. if there are any non-qualifying items in the basket, the non-qualifying reference obligation CCF should be used. For second-to-default transactions, the item with the second lowest credit quality will determine the CCF. The same principle applies to other subsequent-to-default transactions.

7. Calculation of risk-weighted amount for repo-style transactions

7.1 Definition

7.1.1 For capital adequacy purposes, the term "repo-style transactions" is generally taken to refer to any of the following transactions of an AI:

- *Sale & repurchase ("repo") of securities* – the AI agrees to sell securities to a third party for cash with a commitment to repurchase the securities at an agreed price on an agreed future date.
- *Securities lending* – the AI lends securities to a third party and receives either cash or other securities from that party in exchange as collateral.

- *Purchase and resale ("reverse repo") of securities* – the AI agrees to acquire securities from a third party for cash with a commitment to resell the securities at an agreed price on an agreed future date (i.e. the reverse of repo transactions).
- *Securities borrowing* – the AI borrows securities from a third party and gives cash or other securities to that party in exchange as collateral.

7.2 Capital treatment

7.2.1 The following sets out the capital treatment of repo-style transactions in the banking book:

(i) **In the case of repo / reverse repo of securities, where the terms of the repurchase / resale agreement are such that there is no substantial transfer of all risks and rewards of ownership to the counterparty** (i.e. no "ownership transfer"), the "economic substance" approach should be adopted. This means securities sold under the repo agreement should continue to be treated as an asset with a capital requirement provided for the credit risk to the issuer of the securities. A reverse repo transaction should be treated as collateralised lending with a capital requirement provided for the credit risk to the counterparty, and the general capital rules for CRM treatment of collateralised transactions apply. Please refer to the paper on "Credit Risk Mitigation under the Standardised Approach" for treatment of collateralised transactions in detail.

(ii) **In the case of repo / reverse repo of securities, where the terms of the repurchase / resale agreement are such that all risks and rewards of ownership are substantially transferred to the counterparty** (i.e. with "ownership transfer"), the transaction should be separately accounted for as an outright sale / purchase plus a commitment to repurchase / sell back. In terms of capital treatment, securities sold under the repo agreement should not be treated as an asset, but as an (off-balance sheet) commitment to repurchase with a capital requirement provided for the credit risk to the issuer of the securities. Where the price for the commitment to repurchase has not been determined, the fair value (i.e. current market price) as of the reporting date should be used. Securities purchased under resale agreement should be treated as an asset with a capital requirement

provided for the credit risk to the issuer of the securities.

(iii) **For securities lending**, the capital treatment is similar to that of repo transactions without ownership transfer. This means securities lent should continue to be treated as an asset with a capital requirement provided for the credit risk to the issuer of the securities.

(iv) **For securities borrowing**, the capital treatment depends on whether the collateral given is cash or other securities:

- Where the collateral given is cash, the exposure should be treated as a collateralised loan to the counterparty[3]. If the securities borrowed qualify as eligible collateral, the general capital rules for CRM treatment of collateralised transactions apply.
- Where the collateral given is not cash but securities, it should continue to be treated as an asset with a capital requirement provided for the credit risk to the issuer of the securities.

7.2.2 The treatment of repo-style transactions in the trading book is as follows:

(i) Where the securities given or received are treated as an asset, a capital requirement should be provided for the specific risk (i.e. instead of credit risk) of the securities treated as an asset under the market risk regime (see the paper to be developed on the revised capital treatment of market risk exposures).

(ii) Where the transaction is treated as collateralised lending (i.e. reverse repo transactions or securities borrowing against cash collateral), only the comprehensive approach for collateral under the CRM framework should be applied. Also, all assets received may be recognised for CRM purposes. Please refer to the paper on "Credit Risk Mitigation under the Standardised Approach" for details of CRM treatment.

[3] For securities lending or borrowing where the contractual agreement is made between the securities borrower / lender and the custodian (e.g. ***Clearstream Banking or Euroclear Bank)*** and the securities borrower / lender has no knowledge as from / to whom the security is borrowed / lent, the custodian becomes the "counterparty" of the stock borrower / lender.

7.2.3 The capital treatment for repo-style contracts covered by valid bilateral netting agreements is set out in the paper on “Credit Risk Mitigation under the Standardised Approach”.

Annex A: Tables for Mapping Notations used by individual ECAIs into the Credit Quality Grades

Claims on Sovereigns

Credit Quality Grade (Sovereigns)	Risk Weight	S & P	Moody's	Fitch
1	0%	AAA AA+ AA AA-	Aaa Aa1 Aa2 Aa3	AAA AA+ AA AA-
2	20%	A+ A A-	A1 A2 A3	A+ A A-
3	50%	BBB+ BBB BBB-	Baa1 Baa2 Baa3	BBB+ BBB BBB-
4	100%	BB+ BB BB-	Ba1 Ba2 Ba3	BB+ BB BB-
5	100%	B+ B B-	B1 B2 B3	B+ B B-
6	150%	CCC+ CCC CCC- CC C D	Caa1 Caa2 Caa3 Ca C	CCC+ CCC CCC- CC C D
Unrated	100%			

Claims on Banks (and Securities Firms)

Credit Quality Grade (Banks)	Risk Weight	Risk Weight for Short-term Claims[4]	S & P	Moody's	Fitch
1	20%	20%	AAA AA+ AA AA-	Aaa Aa1 Aa2 Aa3	AAA AA+ AA AA-
2	50%	20%	A+ A A-	A1 A2 A3	A+ A A-
3	50%	20%	BBB+ BBB BBB-	Baa1 Baa2 Baa3	BBB+ BBB BBB-
4	100%	50%	BB+ BB BB- B+ B B-	Ba1 Ba2 Ba3 B1 B2 B3	BB+ BB BB- B+ B B-
5	150%	150%	CCC+ CCC CCC- CC C D	Caa1 Caa2 Caa3 Ca C	CCC+ CCC CCC- CC C D
Unrated	50%	20%			

[4] Short-term claims represent claims with original maturity of three months or less. Risk weights for short-term claims are applicable only to claims on banks and not to claims on securities firms.

Claims on Corporates

Credit Quality Grade (Corporates)	Risk Weight	S & P	Moody's	Fitch
1	20%	AAA AA+ AA AA-	Aaa Aa1 Aa2 Aa3	AAA AA+ AA AA-
2	50%	A+ A A-	A1 A2 A3	A+ A A-
3	100%	BBB+ BBB BBB-	Baa1 Baa2 Baa3	BBB+ BBB BBB-
4	100%	BB+ BB BB-	Ba1 Ba2 Ba3	BB+ BB BB-
5	150%	B+ B B- CCC+ CCC CCC- CC C D	B1 B2 B3 Caa1 Caa2 Caa3 Ca C	B+ B B- CCC+ CCC CCC- CC C D
Unrated	100%			

Short-term Facilities (Corporates and Banks)

Short-term Credit Quality Grade (Corporates and Banks)[5]	Risk Weight	S & P	Moody's	Fitch
1	20%	A-1	P-1	TBD[6]
2	50%	A-2	P-2	TBD
3	100%	A-3	P-3	TBD
4	150%	Others	Others	TBD

[5] Since short-term assessments are deemed to be issue specific, they cannot represent the long-term financial position of the issuer.

[6] (TBD: To be determined.) Basel II does not provide the short-term credit rating of Fitch. The short-term ratings will be mapped to the corresponding credit quality grade in due course.

Annex B: Application of External Credit Assessment

Multiple assessments

B.1 If there is only one assessment by an ECAI for a particular claim, that assessment should be used to determine the risk weight of that claim.

B.2 In cases there are multiple credit assessments by different ECAIs for a claim, the following principles apply:

- If there are two assessments by ECAIs which attract different risk weights, the assessment that results in a higher risk weight should be used.
- If there are three or more assessments with different risk weights, the assessments corresponding to the two lowest risk weights should be referred to and the higher of those two risk weights should be applied.

Issuer versus issue assessments

B.3 Where an AI holds a particular issue of debt instrument that has an issue-specific assessment, the AI can use the assessment to risk-weight its claim against the instrument. Where the AI's claim is not an investment in a specific assessed issue, the following general principles apply:

- Where the borrower has a specific assessment for an issued debt instrument that attracts a risk weight lower than that for an unrated claim (i.e. a high quality assessment), such an assessment may be applied to the AI's unassessed claim which ranks pari passu or senior to the assessed issue in all respects.
- Where the borrower has an issuer assessment, this assessment typically applies to senior unsecured claims on that issuer. Consequently, only senior claims on that issuer will benefit from a high quality issuer assessment.
- Where either the issuer or a single issue of debt instrument has a low quality assessment, i.e. one that attracts a risk weight equal to or higher than that for unrated claims, any unassessed claim on the same borrower will be assigned the same risk weight as is applicable to the low quality assessment.

B.4 Whether the AI intends to rely on an issuer assessment or an issue-specific assessment, the assessment must take into account and reflect the entire amount of credit risk exposure the AI has with regard to all payments owed to it. For example, if an AI is owed both principal

and interest, the assessment must fully take into account and reflect the credit risk associated with repayment of both principal and interest.

B.5 In order to avoid any double counting of credit enhancement factors, no CRM techniques will be recognised if the credit enhancement is already reflected in the issue-specific rating.

Domestic currency and foreign currency assessments

B.6 In circumstances where unrated exposures are risk-weighted based on the rating of an equivalent exposure to that borrower, the general rule is that foreign currency ratings would be used for exposures in foreign currency. Domestic currency ratings, if separate, would only be used to risk-weight claims denominated in the domestic currency.

B.7 However, when an exposure arises through an AI's participation in a loan that has been extended, or has been guaranteed against convertibility and transfer risk, by Specified MDBs, its convertibility and transfer risk is considered to be effectively mitigated. In such cases, the borrower's domestic currency rating may be used for capital adequacy purposes instead of its foreign currency rating. The portion of the loan not benefiting from such a guarantee will however be risk-weighted based on the foreign currency rating.

Short-term and long-term assessments

B.8 Short-term assessments may only be used for short-term claims on banks and corporates. Except under the conditions described in paragraph B.9, short-term assessments can only be used to derive risk weights for claims arising specifically from the rated short-term facilities. In no event should they be used to support a risk weight for an unrated long-term exposure.

B.9 The interaction between the general preferential treatment available for short-term claims on banks with an original maturity of not more than three months (as described in paragraph 3.1.10) and the above issue-specific short-term assessments is as follows:

- When there is no specific short-term claim assessment, the general preferential treatment for short-term exposures applies to all exposures to banks of original maturity up to three months.
- When there is a specific assessment for a short-term exposure to a bank and such an assessment maps into a risk weight that is more favourable (i.e. lower)

or identical to that derived from the general preferential treatment, the short-term assessment should be used for the specific exposure only. All unrated short-term exposures would be subject to the general preferential treatment.

- When a specific assessment for a short-term exposure to a bank attracts a less favourable (higher) risk weight, the general short-term preferential treatment cannot be used. All unrated short-term exposures to the bank concerned should receive the same risk weight as that implied by the specific short-term assessment.

B.10 If a rated short-term issue attracts a 50% risk weight, other unrated short-term exposures to the same issuer cannot attract a risk weight lower than 100%. If an issuer has a short-term facility with an assessment that attracts a risk weight of 150%, all unrated exposures to the issuer, whether long-term or short-term, should also receive a 150% risk weight.

Annex C

Appendix 2.1

Guidelines on overdue and rescheduled assets

1. This paper sets out the criteria which are to be applied in determining overdue and rescheduled assets for the purposes of classification under the loan classification framework and for reporting in the Quarterly Analysis of Loans and Advances and Provisions (MA(BS)2A).

Overdue assets

2. The overdue status of the following assets are to be determined as follows:-

a) Loans with a specific expiry date (e.g. a term loan, inward bill loan, advance against trust receipt, packing loan and other loans of similar nature) - these loans should be treated as overdue where the principal or interest is overdue and remains unpaid as at the reporting date. ***(For multiple loans to a single borrower, e.g. where there are more than one trust receipt loans, report only the one overdue according to its overdue period.)***

b) Consumer loans repayable by regular instalments (e.g. residential mortgage loans, hire purchase loans and personal loans) - these loans should be treated as overdue when an instalment payment is overdue and remains unpaid as at the reporting date.

c) Loans repayable on demand (e.g. demand loans and overdrafts) - these loans should be treated as overdue where one or both of the following conditions are met:

i) a demand for repayment has been served on the borrower but repayment has not been made in accordance with the instruction; or

ii) the loan has remained continuously outside the approved limit that was advised to the borrower for more than the period in question (e.g. three months or six months).

d) Bankers acceptances are to be treated as overdue where either the principal or interest of the instruments are still in arrears after the due dates or maturity dates.

e) A bill payable at a determinable date (i.e. usance bill) should be treated as overdue if it remains in arrears after the maturity date. Sight bills/drafts in respect of goods exported from Hong Kong should normally be paid within

one week from the date of presentation (or the arrival of carrying vessel if the buyer is not obliged to pay before the arrival of goods). However, to allow for unforeseeable delays in processing the documents or effecting payments, a grace period of one month will be allowed. These bills should therefore be regarded as overdue if payment is not made within one month after presentation or the arrival of carrying vessel, as the case may be.

3. The period of overdue of a loan which has a determinable due date should commence from the date following such due date. The whole amount of a loan is regarded as overdue even if part of it is not yet due and assessment should be made by reference to the earliest due date of such a loan. For example, if the longest overdue instalment of a loan repayable by monthly instalments has been overdue for six months as at the reporting date, the entire amount of the loan should be considered as overdue for six months.

4. Where partial repayment of an overdue loan repayable by monthly instalments is made, to the extent that it is not financed by a new loan extended by the reporting institution for the purpose of repaying the overdue loan, the repayment should be offset against the earliest instalments due. In the previous example, if the borrower makes a partial repayment reducing the longest overdue instalment to five months, the entire loan may be considered as overdue for five months.

5. If an overdue loan is scheduled to be repaid by a lump sum payment, a partial repayment will not change the overdue status of the remaining loan balance, i.e. the outstanding balance should continue to be treated as overdue with reference to the original due date.

6. An institution should not extend a new loan to a borrower solely for the purpose of repaying an existing overdue loan with the institution. Where the repayment whether partial or whole is financed by a new loan extended by the institution, the overdue status of the initial loan should be considered as unchanged, i.e. as if the new loan and partial repayment had never been made.

7. It is recognised that institutions may decide to increase overdraft limits (or limits of similar facilities) to accommodate the increased financing needs of sound customers. In such cases, the loan would not be regarded as overdue under paragraph 2(c)(ii) above. However, this should only be done on the basis of a well-documented credit evaluation and after the appropriate internal approval have been obtained. An increase in the overdraft limit should not be sanctioned simply to avoid classifying the loan as overdue.

Rescheduled assets

8. Rescheduled assets refer to loans and other assets that have been restructured and renegotiated between the reporting institution and the borrower because of a

deterioration in the financial position of the borrower or of the inability of the borrower to meet the original repayment schedule and for which the revised repayment terms, either of interest or of repayment period, are 'non-commercial' to the bank. A rescheduled asset will normally require an adverse classification under the loan classification system (i.e. substandard or doubtful).

9. The following assets are not regarded as rescheduled even if their repayment terms have been revised:

a) Assets rescheduled in response to the changes in market conditions provided that at the time of rescheduling, the assets have been serviced normally, the ability of borrowers to service the assets according to the revised repayment terms is not in doubt and the rescheduled assets are priced at interest rates equal to the current market interest rates for new assets with similar risks.

b) Rescheduled assets ***whose revised repayment terms are, or become, commercial to the institution and*** where there is reasonable assurance that the borrowers will be able to service all future principal and interest payments on the assets in accordance with the revised repayment terms and the borrowers have serviced all principal and interest payments on the assets in accordance with the revised repayment terms continuously for a reasonable period. The reasonable period of continuing repayments for rescheduled assets with monthly payments (including both interest and principal) is 6 months. For other rescheduled assets, a period of continuing repayment of 12 months would be considered as reasonable.

10. If a rescheduled asset is taken up by a new obligor, the reporting institution may regard it as a new asset (i.e. no longer a rescheduled asset) and classify it according to the creditworthiness of the new obligor provided that :

a) it is restructured with the new obligor on commercial terms;

b) the agreed haircut, if any, has been fully written off upon completion of restructuring; and

c) it is a genuine restructuring and not merely a transfer of an overdue loan among the borrower's group companies. The reporting institution must be satisfied with the creditworthiness and repayment ability of the new obligor (e.g. the new obligor must have sufficient assets that can generate adequate funds to repay the outstanding debt) before entering into the restructuring.

11. A rescheduled asset may be upgraded to "special mention" if : i) the agreed haircut has been fully written off and all the potential losses have been fully provided upon completion of restructuring; and ii) the reporting institution is satisfied that the borrower will be able to service all future principal and interest

payments in accordance with the revised repayment terms. Such asset will however continue to be regarded as rescheduled until the borrowers have serviced all principal and interest payments on the assets in accordance with the revised repayment terms continuously for a reasonable period (see paragraph 9 above).

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CREDIT RISK MITIGATION
UNDER
THE STANDARDISED APPROACH

Hong Kong Monetary Authority
February 2005

Credit Risk Mitigation
under the Standardised Approach

Contents

Annex D: Use of value-at-risk models for repo-style transactions with master netting agreements

1. Introduction

1.1 Terminology

1.1.1 Abbreviations and other terms used in this paper have the following meanings:

- "CRM" means credit risk mitigation, which refers to techniques AIs use to reduce the credit risk of their exposures;
- "Principal Amount" means the amount of any outstanding claim on, or contingent liability in respect of, the relevant counterparty;
- "Specific provisions" include partial write-offs and cover those set aside for bad and doubtful debts, country risk and depreciation of fixed assets;
- "Weighted Amount" means the credit risk-weighted amount in terms of which the capital requirement for the credit risk of an exposure is measured;
- "ECAI" means an external credit assessment institution recognised by the HKMA for capital adequacy purposes;
- "PSE" means a public sector entity. Please refer to paragraph 1.1.1 of the paper on "Weighting Framework for Credit Risk (Standardised Approach)" for definition;
- "MDB" means a multilateral development bank. Please refer to paragraph 1.1.1 of the paper on "Weighting Framework for Credit Risk (Standardised Approach)" for definition;
- "Credit Quality Grade" means a grade represented by the numerals 1, 2, 3, 4, 5 or 6, to which the credit assessment of an ECAI for a credit exposure is mapped for determining the appropriate risk weight for the exposure, as described in a paper to be developed on "Recognition of ECAIs";
- "Recognised exchanges" means those stock exchanges listed in Part 3 of Schedule 1 to the Securities and Futures Ordinance;
- "UCITS" means Undertakings for Collective Investments in Transferable Securities;
- "Repo-style transactions" means transactions involving the sale and repurchase ("repo") of assets, purchase and resale ("reverse repo") of assets, as

well as securities lending and securities borrowing; and

- "Past due" is a term used to describe any exposure that is overdue for more than 90 days or rescheduled. Please refer to paragraph 4.1.12 of the paper on "Weighting Framework for Credit Risk (Standardised Approach)" for details.

1.2 Application

1.2.1 The requirements set out in this paper are applicable to locally incorporated AIs which use the Standardised Approach to measure capital charges for credit risk. This paper should be read in conjunction with the paper on "Weighting Framework for Credit Risk (Standardised Approach)". Other papers to be developed on specific areas such as "Asset Securitisation" and "Recognition of ECAIs" will also be of relevance.

1.3 Background and scope

1.3.1 AIs may use CRM techniques to reduce the credit risk to which they are exposed. Nevertheless, only techniques that satisfy certain qualifying requirements can be recognised by the HKMA for capital adequacy purposes. Providing the qualifying requirements are met, the Weighted Amount of a credit exposure supported by any of these techniques can be reduced. This paper sets out:

- the types of CRM techniques recognised by the HKMA;
- the eligibility criteria for CRM techniques used for capital adequacy purposes; and
- the calculation of Weighted Amount for exposures with recognised CRM techniques.

2. General rules for credit risk mitigation

2.1 The following types of CRM techniques are recognised for the reduction of the Weighted Amount of a credit exposure under the Standardised Approach, provided that they can fulfil the general principles set out in paragraph 2.2 and the specific requirements for individual CRM techniques in sections 3, 4 and 5.

- Collateral;
- Netting; and
- Guarantees and credit derivatives.

2.2 The use of any CRM techniques under the Standardised Approach is subject to the following general principles.

(i) All documentation used for CRM purposes must be binding on all parties and legally enforceable in all relevant jurisdictions. AIs must have conducted sufficient legal reviews to verify this and have a well-founded legal basis to reach this conclusion. Such reviews should be re-conducted whenever necessary to ensure continued enforceability of the documents.

(ii) No transaction in which recognised CRM techniques are used should be subject to a higher capital requirement than an otherwise identical transaction where such techniques are not used.

(iii) The effects of CRM should not be double counted. Therefore, no additional supervisory recognition of CRM will be granted for claims with an issue-specific or principal-only rating in which the CRM effects have already been taken into account.

3. Capital treatment of collateral

3.1 Introduction

3.1.1 Where an AI takes eligible collateral as described under subsection 3.4 below from a counterparty of a credit exposure or a third party on behalf of the counterparty, it is allowed to take account of the risk mitigating effect of the collateral in calculating the capital requirement.

3.1.2 However, regulatory capital relief will only be allowed if the collateral instruments and the risk mitigation process satisfy all the requirements set out in paragraphs 3.2.1 to 3.2.5 in addition to the general principles mentioned in paragraph 2.2.

3.2 Specific requirements

3.2.1 The legal mechanism by which collateral is pledged or transferred must ensure that AIs have the right to liquidate or to take legal possession of the collateral in a timely manner in the event of default, insolvency, bankruptcy (or other pre-defined credit events in the transaction documentation) of the counterparty (and, where applicable, of the custodian holding the collateral).

3.2.2 AIs must have clear and robust procedures for the timely liquidation of collateral. They should ensure that any legal conditions required for declaring the default of a counterparty and liquidating the collateral are properly observed.

3.2.3 AIs must take all necessary steps to fulfil requirements under the law applicable to the AI's interest in the

collateral for obtaining and maintaining an enforceable security interest (e.g. by registering it with a register), or for exercising a right to net or set off in relation to title transfer collateral.

3.2.4 If the collateral is held by a custodian, AIs must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.

3.2.5 The credit quality of the borrower and the value of the collateral must not have a material positive correlation. For example, securities issued by the borrower, or by any related group entity, would not be eligible for regulatory capital purposes since their value would be likely to fall in the case of deterioration in the financial condition of the borrower.

3.3 Approaches to capital treatment

3.3.1 Two approaches to capital treatment are available to AIs for the use of collateral as a CRM technique: the comprehensive approach and the simple approach, subject to the following considerations.

- AIs may choose to operate under either, but not both, approaches for their banking book credit exposures which are performing (i.e. not past due).
- For past due exposures, only the simple approach is allowed.
- For credit exposures in the trading book, only the comprehensive approach is allowed.

3.4 Eligible collateral

Simple Approach

3.4.1 The following types of financial collateral are eligible for recognition under the simple approach for exposures which are performing:

- Cash on deposit with the AI, including certificates of deposit or comparable instruments issued by the AI[1,2];
- Gold;
- Debt securities issued by sovereigns or foreign PSEs that are treated as sovereigns in the relevant

[1] Where an AI issues cash funded credit-linked notes against exposures in the banking book, the exposures will be treated as being collateralised by cash.

[2] When cash on deposit, certificates of deposit or comparable instruments issued by the AI are held as collateral at a third-party bank, if they are openly pledged / assigned to the AI and if the pledge / assignment is unconditional and irrevocable, the exposure amount covered by the collateral (after any necessary haircuts for currency risk) will receive the risk weight of the third-party bank.

countries. The sovereigns or the sovereigns in which the PSE are incorporated must be rated by ECAIs with their ratings equivalent to Credit Quality Grade (Sovereigns) “4” or better;

- Debt securities issued by domestic PSEs, or foreign PSEs that are not treated as sovereigns in the relevant countries. The sovereigns in which the PSEs are incorporated must be rated by ECAIs as equivalent to Credit Quality Grade (Sovereigns) “3” or better[3] ;
- Debt securities that are issued by MDBs, or those issued by banks or securities firms and rated by ECAIs as equivalent to Credit Quality Grade (Banks) “3” or better;
- Debt securities that are issued by corporates and rated by ECAIs as equivalent to Credit Quality Grade (Corporates) “3” or better;
- Short-term debt instruments issued by banks or corporates and with a short-term rating from ECAIs equivalent to Credit Quality Grade (Corporates and banks) “3” or better;
- Debt securities issued by banks, including MDBs and securities firms which are treated as banks for capital adequacy purposes, that are not rated by any ECAI but can meet the following conditions:
  - they are ranked as senior debt;
  - they are listed on a recognised exchange and the AI is confident about the market liquidity of the securities;
  - all rated issues of the same seniority by the issuing bank that are rated equivalent to Credit Quality Grade (Banks) “3” or better by an ECAI or short-term Credit Quality Grade (Corporates and Banks) “3” or better; and
  - the AI has no information to suggest that the issue justifies a rating below the Credit Quality Grade (Banks) “3” or short-term Credit Quality Grade (Corporates or Banks) “3”;
- Equities that are included in any main indexes (i.e. indexes on which futures and options contracts are traded on a recognised exchange); and
- UCITS and mutual funds where:

[3] Claims on PSEs that are not treated as sovereigns in relevant countries should be assigned a risk weight that is one category less favourable than that assigned to their country of incorporation.

- the units have a daily public price quote; and
- the UCITS / mutual fund is limited to investing in the instruments allowed under the simple approach.

3.4.2 For past due exposures, the above list of eligible collateral is expanded to include physical collateral in the form of properties (residential and other properties) whose values are subject to regular revaluation at a minimum frequency of [three months]. AIs may use a "best efforts" basis to derive the current market value of properties, for example by application of available price indices.

Comprehensive Approach

3.4.3 The types of collateral eligible for recognition in the comprehensive approach are as follows:

- All financial collateral recognised in the simple approach for exposures which are performing (i.e. those specified under paragraph 3.4.1);
- Equities which are not included in a main index but are listed on a recognised exchange; and
- UCITS / mutual funds which include such equities.

3.4.4 For repo-style transactions in the trading book that are treated as collateralised loans (i.e. reverse repo transactions or securities borrowing against cash collateral), all assets received by an AI may be recognised for CRM purposes.

3.5 Simple approach

3.5.1 Under the simple approach, the risk weight of the collateral instrument is substituted for the risk weight of the counterparty to the extent covered by the amount of credit protection of the instrument. For the financial collateral included in paragraph 3.4.1, the amount of credit protection is the current market value of the instruments. For the physical collateral mentioned in paragraph 3.4.2, the amount of protection is the current market value of the properties adjusted for the following haircuts:

- Residential properties: 10%; and
- Other properties: 20%.

The portion of the exposures not covered by credit protection should be assigned the risk weight appropriate to the counterparty or to the type of exposure.

3.5.2 The collateral must be pledged for at least the life of the exposure. Furthermore, the collateral must be revalued with a minimum frequency of [six months] for exposures that are performing. For past due exposures, the minimum frequency of revaluation of collateral should be shortened to at least three months.

3.5.3 The risk weight for the collateral specified under paragraph 3.4.1 is generally determined using the risk-weighting framework under the Standardised Approach, but will be subject to a 20% floor except under situations specified as follows:

- Repo-style transactions included in the banking book which are treated as collateralised loans to the counterparty where the criteria set out in **Annex A** are satisfied, and the counterparty is a core market participant (as defined in the Annex), can be risk-weighted at 0%. If the counterparty to the transactions is not a core market participant (but the other criteria set out in the Annex are satisfied), the transaction should receive a risk weight of 10%.
- OTC derivative transactions which are subject to daily mark-to-market and collateralised by cash as well as where the exposure and the collateral are denominated in the same currency, may be assigned a 0% risk weight. Such transactions attract a 10% risk weight if they are collateralised by debt securities issued by sovereigns or PSEs qualifying for a 0% risk weight.
- Gold bullion held in an AI's own vaults or, on an allocated basis, in the vaults of other institutions, to the extent that it is backed by gold bullion liabilities, should receive a risk weight of 0%.
- For other types of transactions, a 0% risk weight is applied in cases where the exposure and the collateral are denominated in the same currency, and the collateral is:
  - cash on deposit; or
  - in the form of debt securities issued by sovereigns or PSEs which are eligible for a 0% risk weight under the Standardised Approach for credit risk and the market value of the securities has been discounted by 20%.

3.5.4 For exposures secured by physical collateral which is recognised for past due exposures only, a risk weight of 100% is applied.

3.5.5 Under the Simple Approach, the calculation of the Weighted Amount of an exposure is set out below:

On-balance sheet assets

(i) First, the Principal Amount, net of specific provisions, if any, of an asset is split into two portions: the portion covered by credit protection (covered portion) and the remaining portion not covered by credit protection (uncovered portion)

(ii) Second, the covered portion is multiplied by the risk weight of the collateral instrument and the uncovered portion the risk weight of the counterparty. The sum of the two products is then the Weighted Amount.

Off-balance sheet exposures other than OTC derivatives[4]

(i) First, the Principal Amount, net of specific provisions, if any, of an exposure is split into both covered and uncovered portions.

(ii) Second, the two portions are multiplied by the applicable CCF to come up with two Credit Equivalent Amounts.

(iii) Third, the Credit Equivalent Amount of the covered portion is multiplied by the risk weight of the collateral instrument while that of the uncovered portion is multiplied by the risk weight of the counterparty. The sum of the two products is then the Weighted Amount.

OTC derivatives[5]

(i) First, the Credit Equivalent Amount of an OTC derivative contract is calculated using the current exposure method (i.e. the sum of the current exposure and the potential exposure of the contract).

(ii) Second, the Credit Equivalent Amount, net of specific provisions, if any, should then be split into covered and uncovered portions.

(iii) Third, the Credit Equivalent Amount of the covered and uncovered portions should be multiplied by the risk weights of the collateral instrument and of the

[4] These refer to items (i) to (ix) and (xvi) under section 5.2 of the paper on "Weighting Framework for Credit Risk (Standardised Approach)".

[5] These refer to items (x) to (xv) under section 5.2 of the paper on "Weighting Framework for Credit Risk (Standardised Approach)".

counterparty respectively. The sum of the two products is then the Weighted Amount.

3.6 Comprehensive approach

3.6.1 The comprehensive approach calculates the capital requirement of a collateralised transaction based on the net credit exposure to a counterparty (E*). In determining the net exposure, haircuts should be applied to the value of the gross exposure to the counterparty (H_e) and the value of any collateral received in support of the counterparty (H_c) to take account of future fluctuations in value. When the exposure and collateral are denominated in different currencies, an additional haircut (H_{fx}) fixed at 8% will be applied to the collateral to make some allowance for future fluctuations in foreign exchange rates.

3.6.2 The net credit exposure to a counterparty (E*) is calculated as follows:

On-balance sheet assets

$$E^* = \max \{0, [E \times (1 + H_e) - C \times (1 - H_c - H_{fx})]\}$$

where:

E^* = Net credit exposure (i.e. exposure value after CRM)

E = Principal Amount, which is net of specific provisions, if any

H_e = Haircut appropriate to the underlying exposure

C = Value of the collateral before CRM

H_c = Haircut appropriate to the collateral

H_{fx} = Haircut appropriate for currency mismatch between the exposure and the collateral

Off-balance sheet exposures other than OTC derivatives

The net credit exposure is the Credit Equivalent Amount of a derivative contact, which is calculated by multiplying the above formula with the applicable CCF. i.e.

$$E^* = \max \{0, [E \times (1 + H_e) - C \times (1 - H_c - H_{fx})]\} \times CCF$$

Variables in the above formula have the same definitions as those under on-balance sheet assets.

OTC derivatives

The net credit exposure is calculated as:

$E^* = \max \{0, [E \times (1 + H_e) - C \times (1 - H_c - H_{fx})]\}$

where:

E = Credit Equivalent Amount (the summation of the current exposure and the potential exposure under the current exposure method), net of specific provisions, if any

Other variables in the above formula have the same definitions as those under on-balance sheet assets.

3.6.3 **Annex B** sets out the details of the standard supervisory haircuts to be applied as H_e and H_c assuming daily mark-to-market, daily remargining and a 10-business-day holding period of the collateral.

3.6.4 Where the collateral is a basket of assets, the haircuts on the basket of assets (H_a) will be calculated as:

$$H_a = \sum_i a_i \times H_i$$

where:

a_i = Weight of an asset in the basket

H_i = Haircut applicable to that asset

3.6.5 The framework for collateral haircuts distinguishes between repo-style transactions, other capital market transactions (i.e. OTC derivatives and margin lending) and secured lending. The appropriate haircut to be used for each of these types of transactions depends on the frequency of remargining or revaluation of and the assumed minimum holding period for the type of transaction. Providing the transactions are subject to daily revaluation or remargining, their minimum holding periods are as follows:

Type of Transactions	Minimum Holding Period	Condition
Repo-style transactions[6]	5 business days	Daily remargining
Other capital market transactions	10 business days	Daily remargining
Secured lending	20 business days	Daily revaluation

3.6.6 Where a transaction has a holding period different from 10 business days or is not remargined or revalued daily as assumed in the standard supervisory haircuts, AIs are required to scale up or down the standard haircuts (H_e, H_c and H_{fx}) depending on the type of transaction and the frequency of remargining or revaluation. The calculation can be expressed as follows:

$$H = H_{10} \times \sqrt{\frac{N_R + (T_M - 1)}{10}}$$

where:

H = Haircut after adjustment for differences in holding period and revaluation frequency

H_{10} = Standard supervisory haircuts based on a minimum holding period of 10 business days

T_M = Minimum holding period for particular type of transaction (i.e. 5 business days for repo-style transactions or 20 business days for secured lending)

N_R = Actual number of days between remargining or revaluation of collateral

3.6.7 To obtain the Weighted Amount of a collateralised transaction, AIs should multiply the value of the net credit exposure (E*) by the risk weight of the counterparty, not that of the collateral instruments.

3.6.8 As the determination of appropriate haircuts is based on the type of transaction, as well as on certain assumptions about the revaluation frequency and holding period of the collateral, AIs intending to use the comprehensive approach are required to have robust

[6] Providing the requirements set out at **Annex A** are satisfied, a repo-style transaction treated as a collateralised loan to a core market participant (as defined in the Annex) will not be subject to any haircuts both for the exposure (i.e. H_e) and collateral (i.e. H_c).

internal policies, systems and procedures for collateral management, covering the revaluation of collateral, and the assumptions on the holding periods of collateral.

4. Capital treatment of netting

4.1 Overview

4.1.1 The use of effective netting agreements may reduce exposure to a counterparty for certain on-balance sheet and off-balance sheet transactions provided that the relevant common requirements set out in paragraph 2.2 are met. AIs must also be able to demonstrate compliance with all requirements to be set out in a paper on "Netting" [HKMA's Policy Paper entitled "Amendment to the 1988 Capital Accord for bilateral netting" only deals with netting of off-balance sheet items. This will be enhanced in due course to cover all types of netting under this section].

4.2 On-balance sheet netting

4.2.1 With a legally enforceable netting or offsetting agreement, AIs may net debit balances from credit balances in the accounts of the same counterparty to arrive at a net credit or debit balance for capital adequacy purposes. AIs are required to provide capital in cases where a net credit exposure results.

4.2.2 The net credit exposure with a counterparty, adjusted for the CRM effect of a valid on-balance sheet netting agreement, is calculated using the following formula:

$$\text{Net credit exposure} = \max [0, \text{assets} - \text{liabilities} \times (1 - H_{fx})]$$

4.2.3 H_{fx} is the haircut, which is 8%, to be applied in the case of a currency mismatch between assets and liabilities. The haircut assumes a minimum holding period of 10-business days and a daily mark-to-market. It should be adjusted according to the formula set out in paragraph 3.6.6 for a different minimum holding period and/or frequency of revaluation.

4.2.4 The Weighted Amount for transactions with netting agreements is calculated by multiplying the net credit exposure by the risk weight of the counterparty.

4.3 Netting of OTC derivative transactions

4.3.1 AIs are allowed to net exposures arising from exchange rate, gold, interest rate, equity, precious metal and commodities contracts with the same counterparty

provided that they are subject to a valid bilateral netting agreement. The bilateral netting agreement for derivative contracts may cover only a single type or more than one type of contracts.

4.3.2 AIs are required to calculate the Credit Equivalent Amount for transactions subject to netting and multiply it by the risk weight of the counterparty to derive the Weighted Amount.

4.3.3 Under the current exposure method, the Credit Equivalent Amount of OTC derivative contracts subject to a valid bilateral netting agreement should be the sum of:

(a) net current exposure, the net amount of the sum of the positive and negative mark-to-market values of the individual contracts covered by the bilateral netting agreement, if positive; and

(b) net potential exposure (the net add-on or A_{Net}), which is derived by adding 40% of the sum of the products derived by multiplying the Principal Amount of each of those contracts by the CCFs and 60% of the Net / Gross Ratio (NGR) multiplied by the sum of the products derived by multiplying the Principal Amount of each of those contracts by the credit conversion factors. This is expressed through the following formula:

$$A_{Net} = 0.4 \times A_{Gross} + 0.6 \times NGR \times A_{Gross}$$

where:

A_{Gross} = the sum of the individual add-on amounts (derived by multiplying the Principal Amount by the CCF) of all contracts covered by valid bilateral netting agreements with one counterparty.

NGR = the ratio of net replacement cost to gross replacement cost for contracts covered by valid bilateral netting agreements.

4.3.4 The NGR in the above formula can be calculated on a counterparty by counterparty or on an aggregate basis for all transactions covered by valid bilateral netting agreements. However, the basis chosen by an AI should be used consistently. An illustration of the calculation of NGR based on the two methods is given in **Annex C**.

4.4 Netting of repo-style transactions

4.4.1 Master netting agreements covering repo-style transactions may be recognised for capital adequacy purposes by users of the comprehensive approach.

4.4.2 For transactions with the same counterparty, the aggregate value of financial assets given out is compared with the value of financial collateral received[7]. Where the former is greater than the latter, a counterparty exposure occurs, as calculated using the following formula, against which a capital requirement should be provided.

$$E^{\#} = \text{Max}\ \{0, [(\sum(E) - \sum(C)) + \sum(E_s \times H_s) + \sum(E_{fx} \times H_{fx})]\}$$

where:

$E^{\#}$ = Counterparty exposure after netting

E = Value of financial assets given out

C = Value of financial collateral received

E_s = Absolute value of the net position in the same securities

H_s = Haircut appropriate to the absolute value of the net position in the same securities (i.e. E_s)

E_{fx} = Absolute value of the net position in a currency different from the settlement currency

H_{fx} = Haircut appropriate for currency mismatch

4.4.3 For appropriate values of haircuts to be applied, please refer to **Annex B**. The risk weight applicable to the counterparty should be used for calculating the Weighted Amount.

4.4.4 In general, repo-style transactions in the banking and trading books should be netted separately. Netting across positions in the banking book and the trading book with the same counterparty will only be allowed if:

- All transactions are marked to market daily; and
- The collateral instruments used in the transactions are within the banking book definition of eligible collateral for capital adequacy purposes.

4.4.5 AIs that have received supervisory recognition for using internal models to measure capital adequacy arising from market risk, subject to the approval of the HKMA, may use a VaR approach as an alternative to the use of

[7] The term "financial collateral" here means, for banking book transactions, only financial instruments eligible for the comprehensive approach of the CRM framework (see paragraph 3.4.3) and for trading book transactions, any financial instruments.

standard supervisory haircuts, to reflect the price volatility of the exposure and collateral for repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterpaty basis. The criteria for using the VaR approach and capital treatment of the VaR approach are set out in **Annex D**.

5. Capital treatment of guarantees and credit derivatives

5.1 Overview

5.1.1 In order to be eligible for the CRM treatments, guarantees (including counter-guarantees) or credit derivatives should meet the common requirements set out in paragraph 2.2, as well as the operational requirements applicable to both instruments. For credit derivatives, there are some additional operational requirements to be met (see subsection 5.2).

5.1.2 For credit derivatives, only credit default swaps and total return swaps that provide credit protection equivalent to guarantees will be recognised. However, where an AI buys the credit protection through a total return swap and records the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the asset that is protected (either through reductions in fair value, or by an addition to reserves or provisions), the credit protection will not be recognised. Cash funded credit linked notes issued by the AI which fulfil the criteria set out in subsection 5.2 for credit derivatives will be treated as cash collateralised transactions.

5.2 Operational requirements

Applicable to both guarantees and credit derivatives

5.2.1 In order for the credit protection provided by a guarantee or credit derivative to be recognised, the following conditions must be satisfied:

(a) It must represent a direct claim on the protection provider.

(b) The credit protection should be linked to specific exposures or a pool of exposures with the undertaking of the protection provider clearly documented in the agreement, so that the extent of protection is clearly defined and incontrovertible.

(c) Other than a protection purchaser's non-payment of money due in respect of the credit protection contract, there should be no clause in the protection

contract that would allow the protection provider to cancel the protection unilaterally or that would increase the effective cost of protection as a result of deteriorating credit quality in the hedged exposure.

(d) There should be no clause in the protection contract that could prevent the protection provider from being obliged to pay out promptly in the event that the underlying borrower fails to make the payment(s) due.

(e) The country where the protection provider is located or incorporated should either have no exchange controls or, where there are exchange controls, approval should have been obtained for the funds to be remitted freely in the event of a call on the obligation.

(f) The protection provider should have no formal recourse to the protection purchaser for losses.

Additional operational requirements for credit derivatives

5.2.2 In order for a credit derivative contract to be recognised, the following additional requirements must be satisfied:

(a) The credit events specified by the contracting parties must at a minimum cover:

- failure to pay the amounts due under the terms of the underlying obligation (with a grace period that is closely in line with that of the underlying obligation);
- bankruptcy, insolvency or inability of the borrower to pay its debts, or its failure or admission in writing of its inability generally to pay its debts as they become due, and analogous events; and
- restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event (i.e. charge-off, specific provision or other similar debit to the profit and loss account). Please refer to paragraph 5.2.3 for the capital treatment of cases where restructuring is not specified as a credit event.

(b) The credit derivative must not terminate prior to expiration of any grace period required for a default on the underlying obligation to occur as a result of a failure to pay.

(c) Credit derivatives allowing for cash settlement must have a robust valuation process in place in order to

estimate loss reliably. There must be a clearly specified period for obtaining post-credit-event valuations of the underlying obligation.

(d) If the credit derivative covers a reference obligation (i.e. the obligation used for purposes of determining cash settlement value, the deliverable obligation or whether a credit event has occurred) that does not include or is different from the underlying obligation, an asset mismatch occurs. A mismatch between the underlying obligation and the reference obligation under the credit derivative is permissible only if:

- the reference obligation ranks pari passu with or is junior to the underlying obligation; and
- the underlying obligation and reference obligation share the same obligor (i.e. the same legal entity) and legally enforceable cross-default or cross-acceleration clauses are in place.

(e) If the protection purchaser's right / ability to transfer the underlying obligation to the protection provider is required for settlement, the terms of the underlying obligation must provide that any required consent to such transfer may not be unreasonably withheld.

(f) The identity of the parties responsible for determining whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection provider. The protection purchaser must have the right / ability to inform the protection provider of the occurrence of a credit event.

5.2.3 When the restructuring of the underlying obligation is not covered by the credit derivative, but the other requirements in paragraph 5.2.2 are met, partial recognition of the credit derivative will be allowed. Firstly, if the amount of the credit derivative is less than or equal to the amount of the underlying obligation, 60% of the amount of the hedge can be recognised as covered. Secondly, if the amount of the credit derivative is larger than that of the underlying obligation, then the amount of eligible hedge is capped at 60% of the amount of the underlying obligation.

5.3 Eligible protection providers

5.3.1 Credit protection given by the following entities under guarantees or credit derivatives will be recognised for capital adequacy purposes:

- Sovereign entities, PSEs, MDBs, banks and securities firms with a lower risk weight than the underlying obligor; or
- Corporate entities with ratings by ECAIs equivalent to Credit Quality Grade (Corporates) "2" or better. This would include credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the underlying obligor.

5.4 Capital treatment

General rules

5.4.1 When calculating the Weighted Amount for exposures covered by guarantees or credit derivatives, the risk weight of the protection provider is substituted for the risk weight of the underlying obligor.

5.4.2 Where the amount covered by the credit protection is less than the whole amount of the underlying exposure, and the secured and unsecured portions are of equal seniority, capital relief is granted on a proportional basis. That means the protected portion is assigned the risk weight of the protection provider while the uncovered portion is assigned the risk weight of the underlying obligor. The calculation of Weighted Amount for exposures covered by guarantees or credit derivatives is the same as that of collateralised exposures under the Simple Approach. Please refer to paragraph 3.5.5 for details.

5.4.3 Where a foreign currency mismatch occurs i.e. when the credit protection is denominated in a currency different from that of the underlying obligation, the portion covered by the credit protection should be reduced by a standard haircut of 8%.

$$G_a = G \times (1 - H_{fx})$$

where:

G_a = The amount of the exposure covered by credit protection and adjusted for currency mismatch

G = Nominal amount of the credit protection

H_{fx} = Haircut appropriate for currency mismatch between the credit protection and underlying obligation

The 8% haircut is based on a 10-business day holding period and daily mark-to-market. This haircut has to be

adjusted by using the formula set out in paragraph 3.6.6 when the minimum holding period or the mark-to-market frequency of the transactions is different from that of the standard supervisory haircut.

5.4.4 Provided that the relevant banking supervisory authorities have exercised the discretion to apply a lower risk weight to claims on their sovereigns (or central banks) that are denominated and funded in the domestic currency, this preferential risk weight will also be available to the portion of claims guaranteed by these sovereigns (or central banks), where the guarantee is denominated in the domestic currency and the exposure is also funded in that currency.

5.4.5 Where an exposure is counter-guaranteed by a sovereign, such an exposure may be treated as covered by a sovereign guarantee provided that:

- the sovereign counter-guarantee covers all credit risk elements of the underlying exposure;
- both the original guarantee and the counter-guarantee meet all operational requirements for guarantees, except that the counter-guarantee need not be direct and explicit to the original claim; and
- the cover is robust and there is no evidence to suggest that the coverage of the counter-guarantee is less effective than that of a direct sovereign guarantee.

CRM treatment specific to credit derivatives

5.4.6 The following are some further rules specific to the CRM treatment of credit derivatives:

(i) Amount of protection of a credit derivative

5.4.7 Where the credit derivative is a total return swap or a credit default swap, the amount of protection will depend on the type of credit event payment defined in the contract:

Type 1 - The protection seller pays the principal amount specified in the contract to the protection buyer in exchange for delivery of the deliverable obligations with the same principal amount, which are specified in the credit derivative contract.

Type 2 - The protection seller pays the principal amount specified in the contract less the market value of the reference obligation to the protection buyer (the market value is calculated by specified calculation agents at some predetermined point in time after a credit event has occurred).

Type 3 - The protection seller pays a fixed amount to the protection buyer.

5.4.8 Where the credit event payment is type 1 or 2, the underlying asset is regarded as fully protected. Where it is a fixed payment, type 3, the amount of protection is the amount of the fixed payment.

5.4.9 Where an underlying asset is protected through the issue of a cash funded credit-linked note, the maximum amount of protection is the amount of funds received from issuing the note. The protected amount is treated as a claim collateralised by cash deposits.

(ii) Materiality thresholds

5.4.10 Materiality thresholds below which no payment will be made in the event of loss are equivalent to retained first-loss positions and must be deducted in full from the capital base of the AI purchasing the credit protection.

(iii) Tranched cover

5.4.11 Where the AI transfers a portion of the risk of an exposure in one or more tranches to a protection provider or providers and retains some level of risk of the exposure, and the risk transferred and the risk retained are of different seniority, the AI may obtain credit protection for either the senior tranche (e.g. second loss portion) or the junior tranche (i.e. first loss portion). In this case, the capital rules to be set out in the paper on "Asset Securitisation" should apply.

(iv) "First-to-default" credit derivatives

5.4.12 First-to-default credit derivatives refer to transactions in which an AI obtains credit protection for a basket of reference names and the first default among the reference names triggers the credit protection. The credit event also terminates the contract. AIs may receive regulatory capital relief for the asset within the basket with the lowest Weighted Amount but only if the principal amount of the asset is less than or equal to the notional amount of the credit derivatives.

5.4.13 With regard to AIs providing credit protection through any form of first-to-default credit derivatives, if the instrument is rated by an ECAI, the risk weights for asset securitisation regarding securitisation tranches will apply. If the instrument is not rated by an ECAI, the risk weights of the assets included in the basket will be aggregated up to a maximum of 1250% and multiplied by the nominal amount of the protection provided by the credit derivative to obtain the Weighted Amount. [Further

details will be set out in the paper on "Asset Securitisation"].

(v) "Second-to-default" credit derivatives

5.4.14 Second-to-default credit derivatives are transactions where the second default among the assets within the basket triggers the credit protection. AIs seeking credit protection through such a product will only be able to obtain capital relief if first-to-default protection has also been obtained or when one of the assets within the basket has already defaulted.

5.4.15 For AIs providing credit protection through any form of second-to-default credit derivatives, the capital treatment is basically the same as in paragraph 5.4.13 above. The difference will be that in aggregating the risk weights, the asset with the lowest Weighted Amount can be excluded from the calculation. [Further details will be set out in the paper on "Asset Securitisation"].

(vi) Multi-entities cover – proportional loss sharing

5.4.16 If the contract allocates protection proportionately among entities in the basket, protection is recognised by setting capital relief against all the reference entities in the basket according to their share of protection under the contract.

6. Other issues relating to credit risk mitigation

6.1 Treatment of pools of CRM techniques

6.1.1 Where an AI has multiple CRM techniques covering a single exposure, for example, having both guarantees and collateral partially supporting an exposure, the AI is required to divide this exposure into different portions covered by different CRM techniques and to calculate the Weighted Amount of each portion separately. Furthermore, when credit protection provided by a single protection provider has different maturities, they must be divided into separate protection as well.

6.1.2 Where the exposure to the borrower is in the form of a general banking facility consisting of several types of credit lines, the AI has the discretion to allocate the effect of the CRM technique(s) among the exposures under these lines to arrive at their respective Weighted Amounts, based on the principles set out in the previous sections, for aggregation.

6.2 Maturity mismatches

Definition of maturity

6.2.1 For collateral, guarantees or credit derivatives, the maturity of both the underlying exposure and the credit protection should be defined conservatively. The effective maturity of the underlying should be regarded as the longest possible remaining time before the obligor is scheduled to fulfil its obligation, taking into account any applicable grace period. For the credit protection, embedded options which may reduce the term of the credit protection should be taken into account such that the shortest possible effective maturity should be considered. Where a call is at the discretion of the protection provider, the maturity will always be the first call date. If the call is at the discretion of the AI as the protection buyer but the terms of the arrangement of obligation of the hedge contain a positive incentive for the buyer to call the transaction before contractual maturity, the remaining time to the first call date will be deemed to be the effective maturity.

Treatment of maturity mismatches

6.2.2 A maturity mismatch occurs when the residual maturity of the credit protection is shorter than that of the underlying exposure. Except for collateral under the simple approach, all CRM techniques will be recognised for capital purposes when the hedge has an original maturity of longer than or equal to one year. As a result, the maturity of hedges for exposures with original maturities of less than one year must be matched to be recognised. In all cases, hedges with maturity mismatches will no longer be recognised when the hedges have a residual maturity of three months or less.

6.2.3 Where a recognised maturity mismatch exists, the value of the CRM protection should additionally be adjusted based on the following formula:

$$P_a = P \times (t - 0.25) / (T - 0.25)$$

where:

P_a = Value of credit protection adjusted for maturity mismatch

P = Value of credit protection adjusted for haircuts for price volatility of collateral and foreign currency mismatch (if applicable)

t = min (T, residual maturity of CRM protection) expressed in years

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

Annex A: Criteria for Preferential Treatment of Repo-style Transactions

A1. The HKMA will allow a preferential risk-weighting treatment for qualified repo-style transactions which satisfy all the requirements in paragraphs A2 to A10. Under the comprehensive approach for collateral, these qualified transactions are not required to be subject to any haircuts. This however is not applicable to AIs using the VaR modelling approach to reflect the price volatility of both the underlying exposure and collateral as set out in **Annex D**. Under the simple approach, these qualified transactions will attract a 0% risk weight.

A2. The counterparty should be a core market participant. The HKMA recognises the following entities as core market participants:

- Sovereigns;
- PSEs;
- MDBs;
- Banks and securities firms that are regarded as banks for capital adequacy purposes – see the paper on "Weighting Framework for Credit Risk (Standardised Approach)";
- Other financial institutions (including insurance companies) eligible for a 20% risk weight under the Standardised Approach; and
- Recognised clearing organisations [to be defined].

A3. Both the exposure and the collateral are cash or securities issued by sovereigns or PSEs treated as sovereigns which qualify for a 0% risk weight.

A4. Both the exposure and the collateral are denominated in the same currency.

A5. Either the transaction is overnight or both the exposure and the collateral are subject to daily mark-to-market and daily remargining.

A6. Following the counterparty's failure to remargin, the time between the last mark-to-market before the failure to remargin and the liquidation of the collateral is no more than four business days.

A7. The transaction is settled across a settlement system proven for that type of transaction.

A8. Standard market documentation in the securities concerned is used for the agreement covering the repo-style transactions.

A9. The documentation of the transaction should specify that the transaction is immediately terminable if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin or otherwise defaults.

A10. Upon any event of default, regardless of whether the counterparty is insolvent or bankrupt, the AI should have an unfettered and legally enforceable right to immediately seize and liquidate the collateral for its benefit.

Annex B: Standard Supervisory Haircuts for the Comprehensive Approach for Collateral

B1. AIs using the comprehensive approach for collateralised transactions are required to use standard supervisory haircuts provided in the table below to adjust the price volatility of both the underlying exposure or the collateral. These haircuts assume daily mark-to-market, daily remargining and a 10-business-day holding period.

(Figures below are in percentages)

Eligible Collateral for CRM		**Sovereigns**[8]	**Other issuers**[9]
Credit Quality Grade / Short-term Credit Quality Grade	**Residual Maturity**		
• Grade 1	≤ 1 year	0.5	1
	> 1 year, ≤ 5 years	2	4
	> 5 years	4	8
• Grades 2 & 3 • Unrated securities issued by banks (or entites treated as banks) satisfying the criteria for eligible collateral as set out in paragraph 3.4.1	≤ 1 year	1	2
	> 1 year, ≤ 5 years	3	6
	> 5 years	6	12
• Grade 4 for sovereigns	All	15	
• Equities in main index (including convertible bonds) and gold		15	
• Other equities (including convertible bonds) listed on a recognised exchange		25	
• UCITS / Mutual funds		Highest haircut applicable to any security in which the fund can invest	
• Cash in the same currency		0	

[8] Haircuts for sovereigns should be applied to MDBs and PSEs treated as sovereigns by their national supervisors.

[9] Other issuers include PSEs not treated as sovereigns by their national supervisors. For the purpose of applying haircuts to such PSEs, AIs should refer to the Credit Quality Grade assigned to the sovereigns in which the PSEs are incorporated. Where the Credit Quality Grade assigned to the sovereign is Grade 4 or below, the securities issued by the PSEs will not be recognised for banking book transactions (but will still be recognised in the case of repo-style transactions in the trading book, with the application of a 25% haircut – see B2 below).

B2. For transactions in which an AI lends to a counterparty instruments that are not included in the above table (e.g. non-investment grade corporate debt securities) the haircut to be applied to the exposure should be the same as the haircut for equity traded on a recognised exchange that is not part of a main index (i.e. 25%).

B3. In cases where the underlying exposure and collateral are denominated in different currencies, a standard supervisory haircut for currency risk of 8% should be imposed to further reduce the value of collateral. This haircut is also based on daily mark-to-market and a 10-business-day holding period.

B4. In the case of repo-style transactions, haircuts for price volatility of the instruments involved in the transactions could be lowered to 0% if the criteria specified in **Annex A** are satisfied.

B5. For repo-style transactions that are treated as collateralised loans in trading book, eligible collateral is expanded to include all assets received by the AI (as mentioned in paragraph 3.4.4). Assets falling outside the definition of eligible collateral (as set out in the table above) should be subject to a 25% haircut.

Annex C: An illustration of the calculation of Net/Gross Ratio (NGR) for derivative transactions

C1. The following table summarizes the calculation of the NGR under the per counterparty and the aggregate basis:

Transaction	**Counterparty A**		**Counterparty B**		**Counterparty C**	
	Notional Amount	Mark to market value	Notional amount	Mark to market value	Notional amount	Mark to market value
Outstanding contract 1	100	10	50	8	30	-3
Outstanding contract 2	100	-5	50	2	30	1
Gross replacement cost (GR)		10		10		1
Net replacement cost (NR)		5		10		0
NGR (per counterparty)	0.5		1		0	
NGR (aggregate)	$\sum$NR / $\sum$GR = 15 / 21 = 0.71					

C2. The gross replacement costs (GR) include only the sums of positive market values; they are therefore, 10, 10 and 1 respectively for counterparties A, B and C. The corresponding net replacement costs (NR) are the non-negative sums of both positive and negative market values, i.e. 5, 10 and 0 for A, B and C respectively. Accordingly, the NGR calculated in the per counterparty basis should be 5/10 = 0.5, 10/10 = 1 and 0/1 = 0 for A, B and C respectively. Based on the per counterparty NGR, the net add-on can be calculated by the given formula in the per counterparty basis. The aggregate net add-on would be the sum of the per counterparty net add-ons.

C3. If the NGR is calculated on an aggregate basis, it will be the ratio of total net replacement costs to total gross replacement costs, i.e. 15/21 = 0.71. The aggregate net add-on is then calculated by applying this ratio to the given formula for the individual counterparty subject to a valid bilateral netting agreement, i.e. A, B and C.

Annex D: Use of Value-at-risk Models for Repo-style Transactions with Master Netting Agreements

D1. AIs that have received supervisory recognition for using internal models to measure capital adequacy requirements relating to market risk, subject to the approval of the HKMA, may use a VaR approach, as an alternative to the use of standard supervisory haircuts, to reflect the price volatility of the exposure and the collateral for repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterpaty basis. Correlation effects between the security positions should be taken into account. In addition, other similar transactions (e.g. prime brokerage) that meet the requirements for repo-style transactions are also eligible for the use of this VaR models approach.

D2. Both the quantitative and qualitative criteria for the recognition of internal models to measure price volatility of the underlying exposure and collateral in collateralised transactions are largely the same as for recognition of the internal models to measure capital requirements relating to market risk, except for the requirement of minimum holding period. When determining the price volatility of collateralised transactions, the minimum holding period is five business days. This holding period should be adjusted upwards in cases where the liquidity of the instruments concerned does not justify such a minimum. Please refer to the SPM module CA-G-3 on "Use of Internal Models to Measure Market Risk" for details of both quantitative and qualitative criteria of using internal models.

D3. As one of the initial and on-going recognition criteria, AIs intending to use or using the VaR modelling approach have to prove the quality of the models to the HKMA through back-testing of the models' output using a sample of 20 counterparties with one-year data. These counterparties should include the 10 largest as determined by the AI according to its own exposure measurement approach and another 10 selected at random. For each day and each counterparty, the AI should compare the previous day's VaR estimate for the counterparty portfolio to the change in the exposure of the previous day's portfolio. This change is 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. Where this difference exceeds the previous day's VaR estimate, an exception occurs. Depending on the

number of exceptions in the observations for the 20 counterparties over the most recent 250 days (i.e. a total of 5,000 observations), the output of the VaR models will be scaled up by using a multiplier as provided in the following table:

Zone	Number of Exceptions	Multiplier
Green Zone	0 –19	None (= 1)
	20 – 39	None (= 1)
	40 – 59	None (= 1)
	60 – 79	None (= 1)
	80 – 99	None (= 1)
Yellow Zone	100 – 119	1.13
	120 – 139	1.17
	140 – 159	1.22
	160 – 179	1.25
	180 – 199	1.28
Red Zone	200 or more	1.33

D4. AIs adopting the VaR approach may calculate the Credit Equivalent Amount of repo-style transactions subject to bilateral netting by using the formula below:

$E^* = \max \{0, [(\sum(E) - \sum(C)) + (\text{VaR output from internal market risk models x multiplier})]\}$

where:

E^* = Credit Equivalent Amount subject to netting

E = Current value of exposure

C = Value of collateral received

VaR output is the VaR number of previous business day

Multiplier is assigned according to the number of exceptions

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WEIGHTING FRAMEWORK FOR CREDIT RISK (IRB APPROACH)

Hong Kong Monetary Authority
February 2005

WEIGHTING FRAMEWORK FOR CREDIT RISK

(IRB APPROACH)

CONTENTS

1. Introduction

1.1 Terminology

1.1.1 Abbreviations and other terms used in this paper have the following meanings:

- "PD" means the probability of default of a counterparty over one year.
- "LGD" means the loss incurred on a facility upon default of a counterparty relative to the amount outstanding at default.
- "EAD" means the expected gross exposure of a facility upon default of a counterparty.
- "M" means the effective maturity which measures the remaining economic maturity of a facility.
- "Dilution risk" means the possibility that the amount of a receivable is reduced through cash or non-cash credits to the receivable's obligor.
- "EL" means the expected loss on a facility arising from the potential default of a counterparty or the dilution risk relative to EAD over one year.
- "UL" means the unexpected loss on a facility arising from the potential default of a counterparty.
- "IRB Approach" means Internal Ratings-based Approach.
- "**Foundation IRB Approach**" means that, in applying the IRB framework, AIs provide their own estimates of PD and use supervisory estimates of LGD and EAD, and, unless otherwise specified by the HKMA, are not required to take into account the effective maturity of credit facilities.
- "**Advanced IRB Approach**" means that, in applying the IRB framework, AIs use their own estimates of PD, LGD and EAD, and are required to take into account the effective maturity of credit facilities.
- "**Standardised Approach**" means a methodology for calculating capital requirements for credit risk in a standardised manner, supported by credit assessments made by recognised external credit assessment institutions. It is the default option for calculating capital requirements for credit risk, except for AIs that have obtained the HKMA's approval to adopt other available options.
- A "borrower grade" means a category of credit-worthiness to which borrowers are assigned on the

basis of a specified and distinct set of rating criteria, from which estimates of PD are derived. The grade definition includes both a description of the degree of default risk typical for borrowers assigned the grade and the criteria used to distinguish that level of credit risk.

1.2 Application

1.2.1 The requirements set out in this paper are applicable to locally incorporated AIs which use or intend to use the IRB Approach to measure capital charges for credit risk.

1.2.2 In the case of AIs that are subsidiaries of foreign banking groups, the HKMA will, where appropriate, co-ordinate/consult with the home supervisors of those banking groups regarding the application of the requirements of this paper. If such AIs plan to adopt in Hong Kong any group-wide IRB systems or models, they will need to satisfy the HKMA that the relevant systems or models can adequately capture the specific risk characteristics of their domestic portfolios, and that any differences in applying the IRB requirements will not have a material impact on the risk estimates generated. Similarly, the HKMA may co-ordinate with the host supervisors of AIs which have maintained banking subsidiaries overseas.

1.2.3 Except for those immaterial exposures exempted under subsection 2.4 of "Criteria for Transition to IRB Approach", the requirements set out in this paper apply generally to the following exposures[1]:

- credit exposures from all the on- and off-balance sheet transactions in the banking book;
- counterparty exposures from over-the-counter derivatives; and
- credit exposures from certain repo-style transactions (see subsection 7.2 of "Weighting Framework for Credit Risk (Standardised Approach)").

1.3 Background and scope

1.3.1 The IRB Approach to credit risk relies on AIs' internally generated inputs in determining the capital requirement for a given exposure. Subject to meeting the minimum

[1] As the IRB Approach does not cover trading book exposures (such as debt and equity securities, derivatives, commodities and certain repo-style transactions held in the trading book), AIs adopting this approach will be subject to the market risk capital adequacy regime for the reporting and calculation of capital charges against these exposures, irrespective of whether they meet the criteria for de minimis exemption from the market risk regime.

qualifying requirements, AIs may seek the HKMA's approval to use their internal estimates of risk components in the calculation of capital. In some cases, AIs may be required to use supervisory estimates for some of the risk components (see paragraph 3.1.2 below).

1.3.2 This paper describes the weighting framework for credit risk under the IRB Approach, including:

- the definitions of asset classes under the IRB Approach;
- the definitions of the risk components which serve as inputs to the risk-weight functions that produce capital requirements for the UL portion for separate asset classes;
- the IRB treatment for each asset class, which begins with a presentation of the relevant risk-weight function(s) followed by the risk components and other relevant factors, such as the treatment of credit risk mitigants; and
- the treatment of EL and the recognition of provisions.

1.3.3 The requirements set out in this paper apply to both the **Foundation IRB Approach** and the **Advanced IRB Approach** and to all asset classes (see subsection 2.1 below), unless stated otherwise.

1.3.4 Where AIs adopt the internal models approach to calculate capital charges for equity exposures, the relevant requirements are set out in section 8 of "Minimum Requirements for Risk Quantification under IRB Approach".

1.3.5 The IRB treatment for securitisation exposures is prescribed in "Weighting Framework for Asset Securitisation"[2].

1.3.6 In cases where an IRB treatment is not specified, the risk weight for those other exposures is 100% and the resulting risk-weighted assets are assumed to represent UL only. This does not, however, apply to the cash items[3] listed in **Table 1** which are subject to a lower risk weight.

2 Mechanics of the IRB Approach

2.1 Categorisation of exposures

[2] To be issued

[3] These cash items are subject to the same risk weight under the **Standardised Approach** (see paragraph 4.1.1 of "Weighting Framework for Credit Risk (Standardised Approach)").

2.1.1 Under the IRB Approach, AIs should categorise exposures in the banking book into broad classes of assets with different underlying risk characteristics, subject to the definitions set out below.

2.1.2 The classes of assets are: (i) corporate; (ii) sovereign; (iii) bank[4]; (iv) retail; and (v) equity. Within the corporate asset class, four sub-classes of specialised lending (see paragraph 2.2.4 below) are separately identified. Within the retail asset class, three sub-classes (see paragraph 2.5.2 below) are separately identified. Within the corporate and retail asset classes, a distinct treatment for purchased receivables may also apply provided certain conditions are met.

2.1.3 The classification of exposures mentioned above is broadly consistent with established banking practice. However, some AIs may use different definitions in their internal risk management and measurement systems. While it is not the intention of the HKMA to require AIs to change the way in which they manage their business and risks, AIs are required to apply the appropriate treatment to each exposure for the purpose of deriving their minimum capital requirements. AIs should demonstrate to the HKMA that their methodology for assigning exposures to different asset classes is appropriate and consistent over time.

2.1.4 The size or exposure limits used for defining some corporate or retail exposures are denominated in Hong Kong dollars (see paragraphs 2.2.2, 2.5.4 and 2.5.9 below). AIs are generally expected to re-classify such exposures when the exposures are no longer within or above the limits[5], as the case may be. However, the HKMA will be flexible if the need for re-classification arises solely from short-term exchange fluctuations for exposures denominated in foreign currencies. AIs should have appropriate policies in place for determining the circumstances for re-classifying the exposures. For example, these may include situations in which the changes are more permanent in nature, having been caused by a major currency revaluation or a natural growth or reduction in size or exposure.

[4] For the avoidance of doubt, all references to "bank" exposures in this paper include exposures to AIs and other overseas incorporated banks which are not AIs.

[5] Re-classification of an exposure will not be required if its outstanding balance falls below the relevant limit mainly as a result of repayments or write-offs.

2.2 Definition of corporate exposures

2.2.1 In general, a corporate exposure is defined as a debt obligation of a corporation, partnership, or proprietorship. AIs are permitted to distinguish separately exposures to small- and medium-sized entities ("SMEs").

SME exposures

2.2.2 An SME is defined as a corporate where the reported sales[6] for the consolidated group of which the firm is a part are less than HK$500 million. To ensure that the information used is timely and accurate, AIs should obtain the consolidated sales figure from the latest available audited financial statements[7] and have it updated at least annually. The basis of consolidation for the borrowing group should follow that used by AIs for their risk management purposes.

Specialised lending ("SL") exposures

2.2.3 Except otherwise specified, a corporate exposure should be classified as SL if it possesses all of the following characteristics, either in legal form or economic substance:

- the exposure is to an entity (often a special purpose entity ("SPE")) which was created specifically to finance and/or operate physical assets;
- the borrowing entity 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;
- the terms of the obligation give the lender a substantial degree of control over the asset(s) and the income that it generates; and
- 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 a broader commercial enterprise.

2.2.4 The four sub-classes of SL are project finance, object finance, commodities finance and income-producing real estate. Each of these sub-classes is considered below.

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[6] This term is used interchangeably with "turnover" or "revenue".

[7] This does not apply to those customers that are not subject to statutory audit (such as a sole proprietor). In such cases, AIs should obtain their latest available management accounts.

Project finance

2.2.5 Project finance ("PF") is a method of funding in which the lender 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, and telecommunications infrastructure. PF may take the form of financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements.

2.2.6 In such transactions, the lender 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 borrower 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

2.2.7 Object finance ("OF") refers to a method of funding the acquisition of physical assets (e.g. taxis, public light buses, ships, aircraft and satellites) 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 lender. 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 a borrower 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

2.2.8 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 borrower has no independent capacity to repay the exposure. This is the case when the borrower 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 borrower. The exposure's rating reflects its self-liquidating nature and the lender's skill in structuring the transaction rather than the credit quality of the borrower.

2.2.9 Such lending can be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate borrowers. AIs are able to rate the credit quality of the latter type of borrowers 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

2.2.10 Income-producing real estate ("IPRE") refers to a method of providing funding to real estate (such as, office buildings, retail shops, residential buildings, industrial or warehouse premises, 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 borrower 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.

2.3 Definition of sovereign exposures

2.3.1 This asset class covers all exposures to counterparties treated as sovereigns under the **Standardised Approach**, including:

- sovereigns (and their central banks);
- public sector entities ("PSEs") that are treated as sovereigns under the **Standardised Approach**[8];
- multilateral development banks ("MDBs") that meet the criteria for a 0% risk weight under the **Standardised Approach**[9]; and
- other entities that receive a 0% risk weight under the **Standardised Approach**, namely, the Bank for International Settlements, the International Monetary

[8] These mainly refer to claims on foreign PSEs that are regarded by the relevant national supervisors as sovereigns in whose jurisdictions the PSEs were established.

[9] See the list of eligible MDBs and the relevant criteria set out in subsection 1.1 of "Weighting Framework for Credit Risk (Standardised Approach)".

Fund, the European Central Bank and the European Community.

2.4 Definition of bank exposures

2.4.1 This asset class covers exposures to:

- banks (including AIs);
- regulated securities firms (including all licensed corporations registered with the SFC)[10];
- domestic PSEs that are treated as banks under the **Standardised Approach**; and
- MDBs that do not meet the criteria for a 0% risk weight under the **Standardised Approach**.

2.5 Definition of retail exposures

General

2.5.1 For an exposure to be categorised as retail, it should satisfy two general criteria:

- the borrower is an individual or a small business that meets a specified exposure threshold (see paragraphs 2.5.3 and 2.5.4 below); and
- the exposure should be one of a large pool of exposures, which are managed by AIs on a pooled or portfolio basis[11] (see paragraph 2.5.5 below).

2.5.2 Within the retail asset class, AIs are required to identify separately three sub-classes of exposures:

- exposures secured by residential properties (see paragraphs 2.5.6 to 2.5.8 below);
- qualifying revolving retail exposures (see paragraph 2.5.9 below); and
- all other retail exposures.

Exposures to individuals

2.5.3 Exposures to individuals are generally eligible for retail treatment regardless of exposure size. Such exposures include residential mortgage loans, revolving credits and lines of credit (e.g. credit cards, overdrafts, and retail facilities secured by financial instruments) as well as personal term loans (e.g. instalment loans, auto loans, tax

[10] See the criteria set out in subsection 1.1 of "Weighting Framework for Credit Risk (Standardised Approach)".

[11] The HKMA does not intend to set the minimum number of retail exposures in a portfolio. AIs should establish their internal policies to ensure the granularity and homogeneity of their retail exposures.

loans, personal finance, and other exposures with similar characteristics).

Small business exposures

2.5.4 Loans extended to small businesses and managed as retail exposures are eligible for retail treatment provided the total exposure of the banking group[12] to a small business borrower (on a consolidated basis where applicable[13]) is less than HK$10 million. Small business loans extended through or guaranteed by an individual are subject to the same exposure threshold.

2.5.5 AIs should manage small business exposures on a pooled basis in their internal risk management systems consistently over time and in the same manner as other retail exposures. This requires that such exposures be originated in a similar manner to other retail exposures. Furthermore, these exposures should not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or pool of exposures with similar risk characteristics for the purposes of risk assessment and quantification. However, this does not preclude retail exposures from being treated individually at some stages of the risk management process. The fact that an exposure is rated individually does not by itself prevent it from being eligible as a retail exposure.

Exposures secured by residential properties

2.5.6 Residential mortgage loans (including first and subsequent liens, term loans and revolving home equity lines of credit) are eligible for retail treatment regardless of exposure size so long as the credit is extended to an individual and the property is or will be occupied by the borrower, or rented[14].

2.5.7 The same retail treatment will also apply to residential mortgage loans granted to shell companies on the condition that the credit risk of such loans is akin to those granted to individuals. This is considered to be the case where:

- the shell company is a residential property holding company with no other business activities;

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[12] The banking group should, at a minimum, cover all entities within the group that are subject to the capital adequacy regime in Hong Kong.

[13] The basis of consolidation should follow that used by an AI for its risk management purposes, provided that exposures to the sole proprietors or partners within the borrowing group are included in the consolidation.

[14] Although the loan-to-value ratio is not a factor for defining residential mortgage loans under the IRB Approach, AIs should continue to adhere to the 70% guideline on loan-to-value ratio as a prudential lending criterion.

- the loan is fully supported by personal guarantees[15] of the directors/shareholders of the company whose repayment ability is adequately assessed, having regard to their other debt obligations; and
- such loans are subject to the same credit underwriting standards applicable to those granted to individuals (e.g. in terms of the loan purpose, loan-to-value ratio, and debt-servicing ratio).

The HKMA will review the above treatment for such shell companies from time to time to assess whether this treatment continues to be appropriate and reserve the right to change it in the light of prevailing market conditions.

2.5.8 Other exposures secured by residential properties that do not satisfy the above requirements should be classified as other retail or corporate exposures, as appropriate.

Qualifying revolving retail exposures ("QRRE")

2.5.9 An AI may regard a sub-portfolio of its retail exposures (which should be consistent with the AI's segmentation of retail activities generally) as QRRE, subject to the following criteria being met:

- the exposures are revolving, unsecured, and uncommitted (both contractually and in practice). In this context, revolving exposures are defined as those where customers' outstanding balances are permitted to fluctuate based on their decisions to borrow and repay, up to a limit established by AIs;
- the exposures are to individuals;
- the maximum exposure to a single individual in the sub-portfolio is HK$1 million or less;
- because the asset correlation assumptions for the QRRE risk-weight function are markedly below those for the other retail risk-weight functions at low PD values, AIs should demonstrate that the use of the QRRE risk-weight function is constrained to portfolios that have exhibited low volatility of loss rates, relative to their average level of loss rates, especially within the low PD bands. The HKMA will, for monitoring purposes, review the relative volatility of loss rates across the QRRE sub-portfolios of AIs;

[15] These should satisfy the relevant operational criteria for guarantees set out in the paper on "Credit Risk Mitigation under the Standardised Approach".

- data on loss rates for the QRRE sub-portfolio should be retained in order to allow analysis of the volatility of loss rates; and
- treatment as QRRE is consistent with the underlying risk characteristics of the sub-portfolio.

2.6 Definition of equity exposures

2.6.1 In general, equity exposures of an AI are defined on the basis of the economic substance of the instrument. They include both direct and indirect ownership interests[16], whether voting or non-voting, in the assets and income of a commercial enterprise or of a financial institution that is not consolidated or deducted for the purpose of calculating the AI's capital base.

2.6.2 An instrument is considered to be an equity exposure if it meets all of the following requirements:

- it is irredeemable in the sense that the return of invested funds can be achieved only by the sale of the investment or sale of the rights to the investment or by the liquidation of the issuer;
- it does not embody an obligation on the part of the issuer; and
- it conveys a residual claim on the assets or income of the issuer.

2.6.3 Additionally, any of the following instruments should be categorised as an equity exposure:

- an instrument with the same structure as those permitted as core capital for AIs;
- an instrument that embodies an obligation on the part of the issuer and meets any of the following conditions:
  - the issuer may defer indefinitely the settlement of the obligation;
  - the obligation requires (or permits at the issuer's discretion) settlement by issuance of a fixed number of the issuer's equity shares;
  - the obligation requires (or permits at the issuer's discretion) settlement by issuance of a variable number of the issuer's equity shares and, other

[16] Indirect equity interests include holdings of derivative instruments tied to equity interests, and holdings in corporations, partnerships, limited liability companies or other types of enterprises that issue ownership interests and are engaged principally in the business of investing in equity instruments.

things being equal, any change in the value of the obligation is attributable to, comparable to, and in the same direction as, the change in the value of a fixed number of the issuer's equity shares[17]; or

- the holder has the option to require that the obligation be settled in equity shares, unless either: (i) in the case of a traded instrument, the HKMA is content that the AI has demonstrated that the instrument trades more like the debt of the issuer than like its equity; or (ii) in the case of non-traded instruments, the HKMA is content that the AI has demonstrated that the instrument should be treated as a debt position. In cases (i) and (ii), AIs may decompose the risks for regulatory purposes, with the consent of the HKMA.

2.6.4 Debt obligations and other securities, partnerships, derivatives or other vehicles structured with the intent of conveying the economic substance of equity ownership are considered as equity holdings[18]. These include liabilities from which the return is linked to that of equities[19]. Conversely, equity investments that are structured with the intent of conveying the economic substance of debt

[17] For certain obligations that require or permit settlement by issuance of a variable number of the issuer's equity shares, the change in the monetary value of the obligation is equal to the change in the fair value of a fixed number of equity shares multiplied by a specified factor. Those obligations meet the conditions under this item if both the factor and the reference number of shares are fixed. For example, an issuer may be required to settle an obligation by issuing shares with a value equal to three times the appreciation in the fair value of 1,000 equity shares. That obligation is considered to be the same as an obligation that requires settlement by issuance of shares equal to the appreciation in the fair value of 3,000 equity shares.

[18] Equities that are recorded as a loan but arise from a debt/equity swap made as part of the orderly realisation or restructuring of the debt are included in the definition of equity holdings. However, these instruments may not attract a lower capital charge than would apply if the holdings remained in the debt portfolio.

[19] The HKMA may decide not to include such liabilities where they are directly hedged by equity holdings, such that the net position does not involve material risk. In order for such direct hedges to be recognised, AIs would need to demonstrate that their models (e.g. value-at-risk models) can satisfy higher standards to capture residual risk due to hedges. The standards would involve accurate estimates of hedge parameters (such as delta, gamma and vega of derivatives) of the instruments which may have complex structures such as convertibility to underlying stocks. The following criteria would apply to the measurement of such parameters:

- AIs' models should capture the non-linear price characteristics of positions, e.g. volatility risk and gamma risk;
- AIs are expected to apply a full three-month price shock to positions; and
- AIs' risk measurement system should have a set of risk factors that captures the volatilities of the underlying equity prices, i.e. vega risk. AIs should have detailed specifications of the relevant volatilities, meaning that they should measure the volatilities broken down by different maturities.

holdings or securitisation exposures would not be considered as equity holdings.

2.6.5 The HKMA may, on a case-by-case basis, re-characterise a debt holding as equity for regulatory purposes based on its nature and economic substance, or otherwise ensure the proper treatment of the holding under the supervisory review process. AIs will be given a chance to demonstrate that the debt holding is more akin to debt rather than to equity.

2.7 Definition of eligible purchased receivables

2.7.1 Eligible purchased receivables[20] are divided into retail and corporate receivables as defined below.

Retail receivables

2.7.2 Purchased retail receivables, provided the purchasing AI complies with the IRB rules for retail exposures, are eligible for the top-down approach as permitted within the existing standards for retail exposures (i.e. estimation of risk components on a pooled basis). The AI should also apply the minimum operational requirements as set out in section 7 below and "Minimum Requirements for Risk Quantification under IRB Approach".

Corporate receivables

2.7.3 In general, for purchased corporate receivables, AIs are expected to assess the default risk of individual obligors as specified in subsection 4.1 below consistent with the treatment of other corporate exposures. AIs are not allowed to use the top-down approach.

3 Foundation and Advanced IRB Approaches

3.1 General requirements

3.1.1 For each of the asset classes covered under the IRB framework, there are three key elements:

- Risk components - estimates of risk parameters provided by AIs, some of which are supervisory estimates;

[20] Such receivables include both self-liquidating debt arising from the sale of goods or services linked to a commercial transaction and general amounts owed by buyers, suppliers, renters, governmental authorities, or other non-affiliated parties not related to the sale of goods or services linked to a commercial transaction. Eligible receivables do not include those associated with securitisations, sub-participations or credit derivatives.

- Risk-weight functions - the means by which risk components are transformed into risk-weighted assets and therefore capital requirements;

- Minimum requirements - the minimum standards that should be met in order for an AI to use the IRB Approach for a given asset class[21].

3.1.2 Under the **Foundation IRB Approach**, as a general rule, AIs provide their own estimates of PD and rely on supervisory estimates for other risk components. Under the **Advanced IRB Approach**, AIs provide their own estimates of PD, LGD and EAD, and their own calculation of M, subject to meeting minimum standards. For both the **Foundation** and **Advanced IRB Approaches**, AIs should always use the risk-weight functions provided in this paper for the purpose of deriving capital requirements.

3.2 Corporate, sovereign and bank exposures

3.2.1 Under the **Foundation IRB Approach**, AIs should provide their own estimates of PD associated with each of their borrower grades, but should use supervisory estimates for other risk components, namely, LGD, EAD and M[22].

3.2.2 Under the **Advanced IRB Approach**, AIs should calculate M and provide their own estimates of PD, LGD and EAD.

3.2.3 There is an exception to the general rule for the four sub-classes of assets identified as SL (i.e. PF, OF, CF and IPRE). AIs that do not meet the requirements for the estimation of PD under the **Foundation IRB Approach** for their SL assets in the corporate asset class are required to map their internal risk grades to five supervisory categories, each of which is associated with a specific risk weight. This is referred to as the "supervisory slotting criteria" approach.

3.3 Retail exposures

3.3.1 For retail exposures, AIs should provide their own estimates of PD, LGD and EAD. There is no distinction between a foundation and an advanced approach for this asset class.

3.4 Equity exposures

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[21] These minimum requirements are set out in "Minimum Requirements for Internal Rating Systems under IRB Approach" and "Minimum Requirements for Risk Quantification under IRB Approach".

[22] Explicit maturity adjustment will not be required under the **Foundation IRB Approach**. However, the HKMA may allow AIs which have systems to calculate the adjusted maturities to measure M for each facility.

3.4.1 There are two broad approaches to calculate risk-weighted assets for equity exposures not held in the trading book: a market-based approach and a PD/LGD approach.

3.4.2 The PD/LGD approach to equity exposures remains available for AIs that adopt the **Advanced IRB Approach** for other exposure types.

3.5 Eligible purchased receivables

3.5.1 The treatment potentially straddles two asset classes. For eligible corporate receivables, both a foundation and an advanced approach are available subject to certain operational requirements being met. For eligible retail receivables, as with the retail asset class, there is no distinction between a foundation and an advanced approach.

4 Rules for corporate, sovereign and bank exposures

4.1 Risk-weighted assets for corporate, sovereign and bank exposures

Formula for derivation of risk-weighted assets

4.1.1 The derivation of risk-weighted assets is dependent on estimates of PD, LGD, EAD and, in some cases, M, for a given exposure. Paragraphs 4.2.37 to 4.2.45 below discuss the circumstances in which the maturity adjustment applies.

4.1.2 Throughout this section, PD and LGD are measured as decimals, and EAD is measured in Hong Kong dollars. For exposures not in default, the formula for calculating risk-weighted assets is:[23, 24]

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[25] (K) = [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)

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[23] ln denotes the natural logarithm.

[24] 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.

[25] If this calculation results in a negative capital charge for any individual sovereign exposure, AIs should apply a zero capital charge for that exposure.

Risk-weighted assets (RWA) = K x 12.5 x EAD

4.1.3 The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD and the AI's best estimate of EL (see paragraphs 4.5.1, 4.5.2 and 4.5.5 of "Minimum Requirements for Risk Quantification under IRB Approach"). The amount of risk-weighted asset for the defaulted exposure is the product of K, 12.5, and EAD.

4.1.4 Illustrative risk weights are shown in **Table 2**.

Firm-size adjustment for SMEs

4.1.5 Under the IRB Approach for corporate credits, AIs are permitted to separately distinguish exposures to SME borrowers (defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than HK$500 million) from those to large firms[26]. A firm-size adjustment (i.e. 0.04 x (1 - (S-50) / 450)) is made to the corporate risk-weight formula for exposures to SME borrowers. S is expressed as total annual sales in millions of HK$ with values of S falling in the range of equal to or less than HK$500 million or greater than or equal to HK$50 million. Reported sales of less than HK$50 million will be treated as if they were equivalent to HK$50 million for the purposes of the firm-size adjustment for SME borrowers.

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 - 50) / 450)

4.1.6 In the case where total sales are not a meaningful indicator of firm size for particular companies, the HKMA may on an exceptional basis allow AIs to substitute total assets of the consolidated group for total sales in calculating the SME threshold and the firm-size adjustment. However, AIs should not make use of this special treatment to obtain capital relief.

Risk weights for SL

4.1.7 AIs that do not meet the requirements for the estimation of PD under the IRB Approach for corporate exposures will be required to map their internal grades for the SL exposures to five supervisory categories, each of which is associated with a specific risk weight. The slotting criteria on which this mapping should be based are provided in **Table 3**.

[26] AIs should not apply a firm-size adjustment to a corporate customer which cannot make available the sales figure for the consolidated group of which the customer is a part.

4.1.8 The risk weights for UL associated with each supervisory category broadly correspond to a range of external credit assessments[27] as outlined below:

Strong	Good	Satisfactory	Weak	Default
70%	90%	115%	250%	0%
BBB- or better	BB+ or BB	BB- or B+	B to C-	Not applicable

4.1.9 Subject to the HKMA's approval, AIs may assign preferential risk weights of 50% to "strong" exposures, and 70% to "good" exposures, provided they have a remaining maturity of less than 2.5 years or the HKMA determines that AIs' underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria for the relevant supervisory risk category.

4.1.10 AIs that meet the requirements for the estimation of PD are able to use the **Foundation IRB Approach** for corporate exposures to derive risk weights for SL sub-classes.

4.1.11 AIs that meet the requirements for the estimation of PD and LGD and/or EAD are able to use the **Advanced IRB Approach** for corporate exposures to derive risk weights for SL sub-classes.

4.2 Risk components

Probability of default (PD)

4.2.1 For corporate and bank exposures, the PD is the greater of the one-year PD associated with the internal borrower grade to which that exposure is assigned, or 0.03%. For sovereign exposures, the PD is the one-year PD associated with the internal borrower grade to which that exposure is assigned. The PD of borrowers assigned to a default grade(s), consistent with the reference definition of default, is 100%. The minimum requirements for the derivation of the PD estimates associated with each internal borrower grade are outlined in paragraphs 4.4.1 to 4.4.9 of "Minimum Requirements for Risk Quantification under IRB Approach".

Loss given default (LGD)

4.2.2 AIs should provide an estimate of the LGD for each corporate, sovereign and bank exposure. There are two

[27] The notations follow the methodology used by Standard & Poor's. The use of Standard & Poor's credit ratings is for reference only; those of some other external credit assessment institutions ("ECAIs") could equally well be used. The ratings used throughout this paper, therefore, do not reflect any preferences or determinations on ECAIs by the HKMA.

approaches for deriving this estimate: the **Foundation IRB Approach** and the **Advanced IRB Approach**.

LGD under the Foundation IRB Approach

Treatment of unsecured claims and non-recognised collateral

4.2.3 Under the **Foundation IRB Approach**, senior claims on corporates, sovereigns and banks not secured by recognised collateral will be assigned a 45% LGD.

4.2.4 All subordinated claims on corporates, sovereigns and banks will be assigned a 75% LGD. A subordinated loan is a facility that is expressly subordinated to another facility.

Collateral under the Foundation IRB Approach

4.2.5 In addition to the eligible financial collateral recognised in the **Standardised Approach**, under the **Foundation IRB Approach** some other forms of collateral, known as eligible IRB collateral, are also recognised. These include receivables, specified commercial and residential real estate ("CRE/RRE"), and other collateral, where they meet the minimum requirements set out in sections 6 and 7 of "Minimum Requirements for Risk Quantification under IRB Approach". For eligible financial collateral, the requirements are identical to the operational standards as set out in "Credit Risk Mitigation under the Standardised Approach".

Methodology for recognition of eligible financial collateral under the Foundation IRB Approach

4.2.6 The methodology for the recognition of eligible financial collateral closely follows that outlined in the comprehensive approach to collateral in the **Standardised Approach** (see subsections 3.6 and 4.4 of "Credit Risk Mitigation under the Standardised Approach"). The simple approach to collateral under the **Standardised Approach** will not be available to AIs applying the IRB Approach.

4.2.7 Following the comprehensive approach, the effective loss given default ("LGD*") applicable to a collateralised transaction can be expressed as follows, where:

- LGD is that of the senior unsecured exposure before recognition of collateral (45%);
- E is the current value of the exposure (i.e. cash lent or securities lent or posted);
- E* is the exposure value after risk mitigation as determined in the **Standardised Approach** (see subsection 3.6 of "Credit Risk Mitigation under the Standardised Approach"). This concept is only used to calculate LGD*. AIs should continue to calculate EAD without taking into account the presence of any collateral, unless otherwise specified.

LGD* = LGD x (E* / E)

4.2.8 AIs that qualify for the **Foundation IRB Approach** may calculate E* using any of the ways specified under the comprehensive approach for collateralised transactions under the **Standardised Approach**.

4.2.9 Where repo-style transactions are subject to a master netting agreement, AIs may choose not to recognise the netting effects in calculating capital. AIs that want to recognise the effect of master netting agreements on such transactions for capital purposes should satisfy the criteria provided in the **Standardised Approach** (see subsection 4.4 of "Credit Risk Mitigation under the Standardised Approach"). AIs should calculate E* in accordance with subsection 4.4 of "Credit Risk Mitigation under the Standardised Approach" and equate this to EAD. The impact of collateral on these transactions may not be reflected through an adjustment to LGD.

Carve out from the comprehensive approach

4.2.10 As in the **Standardised Approach**, a haircut of zero is applied for repo transactions where conditions specified under **Annex A** of "Credit Risk Mitigation under the Standardised Approach" are satisfied and in addition, the counterparty is a core market participant as specified in **Annex A** of the same paper.

Methodology for recognition of eligible IRB collateral

4.2.11 The methodology for determining the effective LGD under the **Foundation IRB Approach** for cases where AIs have taken eligible IRB collateral to secure a corporate exposure is described below:

- exposures where the minimum eligibility requirements are met, but the ratio of the current value of the collateral received (C) to the current value of the exposure (E) is below a threshold level of C* (i.e. the required minimum collateralisation level for the exposure) would receive the appropriate LGD for unsecured exposures or those secured by collateral which is not eligible financial collateral or eligible IRB collateral according to paragraphs 4.2.3 and 4.2.4 above; and

- exposures where the ratio of C to E exceeds another threshold level of C** (i.e. the required level of over-collateralisation for full LGD recognition) would be assigned an LGD according to the table below.

	Minimum LGD	Required minimum collateralisation level of the exposure (C*)	Required level of over-collateralisation for full LGD recognition (C**)
Eligible financial collateral	0%	0%	Not applicable
Receivables	35%	0%	125%
CRE/RRE	35%	30%	140%
Other collateral[28]	40%	30%	140%

4.2.12 Under the **Foundation IRB Approach**, the effective LGD for the secured and unsecured portion of senior exposures is then determined as follows:

- senior exposures are to be divided into fully collateralised and uncollateralised portions;
- the part of the exposure considered to be fully collateralised, C/C**, receives the LGD associated with the type of collateral according to the table in paragraph 4.2.11 above; and
- the remaining part of the exposure is regarded as unsecured and receives an LGD of 45%.

Methodology for the treatment of pools of collateral

4.2.13 The methodology for determining the effective LGD of a transaction under the **Foundation IRB Approach** where AIs have taken both financial collateral and other eligible IRB collateral is aligned to the treatment in the **Standardised Approach** and based on the guidance set out in paragraphs 4.2.14 to 4.2.16 below.

4.2.14 In the case where an AI has obtained multiple forms of credit risk mitigation ("CRM"), it will be required to subdivide the adjusted value of the exposure (after the haircut for eligible financial collateral) into portions each covered by only one CRM type. That is, the AI should divide the exposure into the portion covered by eligible financial collateral, the portion covered by receivables, the portion covered by CRE/RRE collateral, the portion covered by other collateral, and an unsecured portion, where relevant.

[28] Other collateral excludes physical assets acquired by AIs as a result of a loan default.

4.2.15 Where the ratio of the sum of the value of CRE/RRE and other collateral to the reduced exposure (after recognising the effect of eligible financial collateral and receivables collateral) is below the associated threshold level (i.e. the minimum degree of collateralisation of the exposure), the exposure would receive the appropriate unsecured LGD value of 45%.

4.2.16 The risk-weighted assets for each fully secured portion of exposure should be calculated separately.

LGD under the Advanced IRB Approach

4.2.17 Subject to the minimum requirements specified in subsection 4.5 of "Minimum Requirements for Risk Quantification under IRB Approach", AIs are allowed to use their own internal estimates of LGD for corporate, sovereign and bank exposures. The LGD should be measured as a percentage of the EAD. AIs eligible for the IRB Approach that are unable to meet these minimum requirements should utilise the foundation LGD treatment described in paragraphs 4.2.3 to 4.2.16 above.

Treatment of certain repo-style transactions

4.2.18 AIs that wish to recognise the effects of master netting agreements on repo-style transactions for capital purposes should apply the methodology outlined in paragraph 4.2.9 above for determining E* for use as the EAD. For AIs using the **Advanced IRB Approach**, their own LGD estimates would be permitted for the unsecured equivalent amount (E*).

Treatment of guarantees and credit derivatives

4.2.19 There are two approaches for recognition of CRM in the form of guarantees and credit derivatives in the IRB Approach: the **Foundation IRB Approach** for AIs using supervisory values of LGD, and the **Advanced IRB Approach** for AIs using their own internal estimates of LGD.

4.2.20 Under either approach, CRM in the form of guarantees and credit derivatives should not reflect the effect of double default[29] (see paragraph 4.7.4 of "Minimum Requirements for Risk Quantification under IRB Approach"). As such, to the extent that the CRM is recognised by an AI, the

[29] Double default refers to the situation in which a guaranteed exposure is assigned an adjusted PD or LGD such that the adjusted risk weight would be lower than that of a comparable, direct exposure to the guarantor. Neither criteria nor rating processes are permitted to consider possible favourable effects of imperfect expected correlation between default events for the borrower and guarantor for the purposes of calculating regulatory minimum capital requirements.

adjusted risk weight will not be less than that of a comparable direct exposure to the protection provider. Consistent with the **Standardised Approach**, AIs may choose not to recognise credit protection if doing so would result in a higher capital requirement.

Recognition under the Foundation IRB Approach

4.2.21 For AIs using the **Foundation IRB Approach** for LGD, the approach to guarantees and credit derivatives closely follows the treatment under the **Standardised Approach** as specified in subsection 5.4 of "Credit Risk Mitigation under the Standardised Approach". The range of eligible guarantors is the same as under the **Standardised Approach** except that companies that are internally rated and associated with a PD equivalent to A- or better may also be recognised under the **Foundation IRB Approach**. To receive recognition, the requirements outlined in subsection 5.4 of "Credit Risk Mitigation under the Standardised Approach" should be met.

4.2.22 Eligible guarantees from eligible guarantors will be recognised as follows:

- for the covered portion of the exposure, a risk weight is derived by taking the risk-weight function appropriate to the type of guarantor, and the PD appropriate to the guarantor's borrower grade, or some grade between the underlying obligor and the guarantor's borrower grade if the AI deems a full substitution treatment not to be warranted.
- the AI may replace the LGD of the underlying transaction with the LGD applicable to the guarantee taking into account seniority and any collateralisation of a guaranteed commitment.

4.2.23 The uncovered portion of the exposure is assigned the risk weight associated with the underlying obligor.

4.2.24 Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, it is necessary to split the exposure into a covered and an uncovered amount. The treatment in the **Foundation IRB Approach** follows that outlined in paragraphs 5.4.2, 5.4.3 and 5.4.11 of "Credit Risk Mitigation under the Standardised Approach", and depends upon whether the cover is proportional or tranched.

Recognition under the Advanced IRB Approach

4.2.25 AIs using the **Advanced IRB Approach** for estimating LGD may reflect the risk-mitigating effect of guarantees and credit derivatives through adjusting either PD or LGD estimates. Whether adjustments are done through PD or LGD, they should be done in a consistent manner for a

given guarantee or credit derivative type. In doing so, AIs should not include the effect of double default in such adjustments. Thus, the adjusted risk weight should not be less than that of a comparable direct exposure to the protection provider.

4.2.26 An AI relying on its own estimates of LGD has the option to adopt the treatment outlined above for AIs under the **Foundation IRB Approach** (see paragraphs 4.2.21 to 4.2.24 above), or to make an adjustment to its LGD estimate of the exposure to reflect the presence of the guarantee or credit derivative. Under this option, there are no limits to the range of eligible guarantors although the set of minimum requirements provided in paragraphs 4.7.5 and 4.7.6 of "Minimum Requirements for Risk Quantification under IRB Approach" concerning the type of guarantee should be satisfied. For credit derivatives, the requirements set out in paragraphs 4.7.10 to 4.7.12 of the same paper should be satisfied[30].

Exposure at default (EAD)

4.2.27 The following paragraphs on EAD apply to both on- and off-balance sheet positions. All exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of:

(i) the amount by which an AI's regulatory capital would be reduced if the exposure were written-off fully; and

(ii) any specific provisions and partial write-offs.

When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of risk-weighted assets is independent of any discounts. Under the limited circumstances described in paragraph 8.2.1 below, discounts may be included in the measurement of total eligible provisions for the purposes of the calculation of EL and provisions set out in section 8 below.

<u>Exposure measurement for on-balance sheet items</u>

4.2.28 On-balance sheet netting of loans and deposits will be recognised subject to the same conditions set out in the **Standardised Approach** (see subsection 4.2 of "Credit Risk Mitigation under the Standardised Approach"). Where currency or maturity mismatched on-balance sheet netting exists, the treatment follows the **Standardised Approach**,

[30] When credit derivatives do not cover the restructuring of the underlying obligation, the partial recognition set out in paragraph 5.2.3 of "Credit Risk Mitigation under the Standardised Approach" applies.

as set out in paragraphs 5.4.3 and 6.2.2 of "Credit Risk Mitigation under the Standardised Approach".

Exposure measurement for off-balance sheet items (with the exception of foreign exchange and interest rate, equity, and commodity-related derivatives)

4.2.29 For off-balance sheet items, exposure is calculated as the committed but undrawn amount multiplied by a credit conversion factor ("CCF").

EAD under the Foundation IRB Approach

4.2.30 The types of instruments and the CCFs applied to them are the same as those in the **Standardised Approach**, as outlined in subsection 5.2 of "Weighting Framework for Credit Risk (Standardised Approach)" with the exception of commitments, Note Issuance Facilities ("NIFs") and Revolving Underwriting Facilities ("RUFs").

4.2.31 A CCF of 75% will be applied to commitments, NIFs and RUFs regardless of the maturity of the underlying facility. This does not apply to those facilities that are uncommitted, unconditionally cancellable, or that effectively provide for automatic cancellation, for example due to deterioration in a borrower's credit-worthiness, at any time by the AI without prior notice. A CCF of 0% will be applied to these facilities.

4.2.32 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 a borrower's reported cash flow. If the facility is constrained in this way, AIs should have sufficient line monitoring and management procedures to support this contention.

4.2.33 In order to apply a 0% CCF for unconditionally and immediately cancellable corporate overdrafts and other facilities, AIs should demonstrate that they actively monitor the financial condition of the borrower, and that their internal control systems are such that they could cancel the facility upon evidence of a deterioration in the credit quality of the borrower.

4.2.34 Where a commitment is obtained on another off-balance sheet exposure, the lower of the applicable CCFs should be used.

EAD under the Advanced Approach

4.2.35 AIs which meet the minimum requirements for use of their own estimates of EAD (see paragraphs 4.6.1 to 4.6.8 of "Minimum Requirements for Risk Quantification under IRB Approach") will be allowed to use their own estimates of CCFs across different product types provided the exposure

is not subject to a CCF of 100% in the **Foundation IRB Approach** (see paragraph 4.2.30 above).

Exposure measurement for foreign exchange, interest rate, equity, credit, and commodity-related derivatives

4.2.36 Measures of exposure for these instruments under the IRB Approach will be calculated as per the rules for the calculation of credit equivalent amounts, i.e. based on the replacement cost plus potential future exposure add-ons across the different product types and maturity bands (see section 5 of "Weighting Framework for Credit Risk (Standardised Approach)").

Effective maturity (M)

4.2.37 For AIs using the **Foundation IRB Approach** for corporate exposures, the M will be 2.5 years except for repo-style transactions where the M will be 6 months. AIs using any element of the **Advanced IRB Approach** are required to measure the M for each facility as defined below.

4.2.38 Except as noted in paragraph 4.2.42 below, the M is defined as the greater of one year and the remaining effective maturity in years as defined in paragraphs 4.2.39 to 4.2.41 below. In all cases, the M will be no greater than five years.

4.2.39 For an instrument subject to a determined cash flow schedule, the M is defined as:

$$M = \sum_t t * CF_t / \sum_t CF_t$$

where CF_t denotes the cash flows (principal, interest payments and fees) contractually payable by the borrower in period t.

4.2.40 If an AI is not in a position to calculate the M of the contracted payments as noted above, it is allowed to use a more conservative measure of M. An example of this measurement is the maximum remaining time (in years) that the borrower is permitted to take to fully discharge its contractual obligation (principal, interest, and fees) under the terms of the loan agreement. Normally, this will correspond to the nominal maturity of the instrument.

4.2.41 For derivatives subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. Further, the notional amount of each transaction should be used for weighting the maturity.

4.2.42 The one-year floor does not apply to certain short-term exposures as defined in paragraph 4.2.43 below. These exemptions are only available for exposures with an original maturity of below one year. In such cases, the maturity would be calculated as the greater of one day and the effective maturity (M, consistent with the definition above).

This treatment targets transactions that are not a part of the AI's ongoing financing of the obligor. These transactions include financial market transactions, and one-off short-term exposures that are transaction-oriented.

4.2.43 Short-term exposures that satisfy the criteria provided in the preceding paragraph include:

- repo-style transactions and short-term loans and deposits;
- exposures arising from securities lending transactions;
- short-term self-liquidating trade transactions. Import and export letters of credit and similar transactions could be accounted for at their actual remaining maturity;
- exposures arising from settling securities purchases and sales. This could also include overdrafts arising from failed securities settlements provided that such overdrafts do not continue more than a short, fixed number of business days;
- exposures arising from cash settlements by wire transfer, including overdrafts arising from failed transfers provided that such overdrafts do not continue more than a short, fixed number of business days; and
- exposures to banks arising from foreign exchange settlements.

4.2.44 For repo-style transactions subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. A five-day floor will apply to the average. Further, the notional amount of each transaction should be used for weighting the maturity.

4.2.45 Where there is no explicit adjustment, the M assigned to all exposures is set at 2.5 years unless otherwise specified in paragraph 4.2.37 above.

Treatment of maturity mismatches

4.2.46 The treatment of maturity mismatches under IRB is identical to that in the **Standardised Approach** (see subsection 6.2 of "Credit Risk Mitigation under the Standardised Approach").

5 Rules for retail exposures

5.1 Risk-weighted assets for retail exposures

5.1.1 There are three separate risk-weight functions for retail exposures, as defined in paragraphs 5.1.2 to 5.1.8 below. Risk weights for retail exposures are based on separate assessments of PD and LGD as inputs to the risk-weight functions. None of the three retail risk-weight functions contains an explicit maturity adjustment. Throughout this section, PD and LGD are measured as decimals, and EAD is measured in Hong Kong dollars.

Residential mortgage exposures

5.1.2 For exposures defined in paragraphs 2.5.6 and 2.5.7 above that are not in default and are secured or partly secured[31] by residential mortgages, risk weights are assigned based on the following formula:

Correlation (R) = 0.15

Capital requirement (K) = LGD × N[(1 - R)^-0.5 × G (PD) + (R / (1 - R))^0.5 × G (0.999)] - PD x LGD

Risk-weighted assets = K x 12.5 x EAD

5.1.3 The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD (described in paragraphs 4.5.1 to 4.5.2 of "Minimum Requirements for Risk Quantification under IRB Approach") and an AI's best estimate of EL (described in paragraph 4.5.5 of the same paper). The amount of risk-weighted asset for the defaulted exposure is the product of K, 12.5, and the EAD.

QRRE

5.1.4 For QRRE as defined in paragraph 2.5.9 above that are not in default, risk weights are assigned based on the following formula:

Correlation (R) = 0.04

Capital requirement (K) = LGD × N[(1 - R)^-0.5 × G (PD) + (R / (1 - R))^0.5 × G (0.999)] - PD x LGD

Risk-weighted assets = K x 12.5 x EAD

5.1.5 The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD (described in paragraphs 4.5.1 to 4.5.2 of "Minimum Requirements for Risk Quantification under IRB Approach") and an AI's best estimate of EL (described in paragraph 4.5.5 of the same paper). The amount of risk-weighted

[31] This means that risk weights for residential mortgages also apply to the unsecured portion of such residential mortgages.

asset for the defaulted exposure is the product of K, 12.5, and the EAD.

Other retail exposures

5.1.6 For all other retail exposures that are not in default, risk weights are assigned based on the following function, which also allows correlation to vary with PD:

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

Capital requirement (K) = LGD × N[(1 - R)^-0.5 × G (PD) + (R / (1 - R))^0.5 × G (0.999)] - PD x LGD

Risk-weighted assets = K x 12.5 x EAD

5.1.7 The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD (described in paragraphs 4.5.1 to 4.5.2 of "Minimum Requirements for Risk Quantification under IRB Approach") and an AI's best estimate of EL (described in paragraph 4.5.5 of the same paper). The amount of risk-weighted asset for the defaulted exposure is the product of K, 12.5, and the EAD.

5.1.8 Illustrative risk weights are shown in **Table 2**.

5.2 Risk components

Probability of default (PD) and loss given default (LGD)

5.2.1 For each identified pool of retail exposures, AIs are expected to provide an estimate of the PD and LGD associated with the pool, subject to the minimum requirements as set out in "Minimum Requirements for Risk Quantification under IRB Approach". Additionally, the PD for retail exposures is the greater of the one-year PD associated with the internal borrower grade to which the pool of retail exposures is assigned or 0.03%.

5.2.2 Owing to the potential for very long-run cycles in property prices which even comparatively long runs of data may not adequately capture, during the transition period from 1 January 2007 to 31 December 2009, LGDs for retail exposures secured by residential properties cannot be set below 10% for any sub-segment of exposures to which the formula in paragraph 5.1.2 above is applied[32]. During the

[32] The 10% LGD floor shall not apply, however, to sub-segments that are subject to/benefit from sovereign guarantees. Further, the existence of the floor does not imply any waiver of the requirements of LGD estimation as laid out in paragraphs 4.5.1 to 4.5.2 of "Minimum Requirements for Risk Quantification under IRB Approach".

transition period the HKMA will review the potential need for continuation of this floor.

Recognition of guarantees and credit derivatives

5.2.3 AIs may reflect the risk-reducing effects of guarantees and credit derivatives, either in support of an individual obligation or a pool of exposures, through an adjustment of either the PD or LGD estimate, subject to the minimum requirements set out in paragraphs 4.7.2 to 4.7.12 of "Minimum Requirements for Risk Quantification under IRB Approach". Whether adjustments are made through PD or LGD, they should be made in a consistent manner for a given guarantee or credit derivative type.

5.2.4 Consistent with the requirements outlined above for corporate, sovereign and bank exposures, AIs should not include the effect of double default in such adjustments. The adjusted risk weight should not be less than that of a comparable direct exposure to the protection provider. Consistent with the **Standardised Approach**, AIs may choose not to recognise credit protection if doing so would result in a higher capital requirement.

Exposure at default (EAD)

5.2.5 Both on and off-balance sheet retail exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of:

(i) the amount by which an AI's regulatory capital would be reduced if the exposure were written-off fully; and

(ii) any specific provisions and partial write-offs.

When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of risk-weighted assets is independent of any discounts. Under the limited circumstances described in paragraph 8.2.1 below, discounts may be included in the measurement of total eligible provisions for the purposes of calculating EL and provisions as set out in section 8 below.

5.2.6 On-balance sheet netting of loans and deposits of an AI to or from a retail customer will be permitted subject to the same conditions outlined in subsection 4.2 of "Credit Risk Mitigation under the Standardised Approach". For retail off-balance sheet items, AIs should use their own estimates of CCFs provided the minimum requirements in paragraphs 4.6.1 to 4.6.7 and 4.6.9 to 4.6.10 of "Minimum Requirements for Risk Quantification under IRB Approach" are satisfied.

5.2.7 For retail exposures with uncertain future drawdown such as credit cards, AIs should take into account their history

and/or expectation of additional drawings prior to default in their overall calibration of loss estimates. In particular, where an AI does not reflect CCFs for undrawn lines in its EAD estimates, it should reflect in its LGD estimates the likelihood of additional drawings prior to default. Conversely, if an AI does not incorporate the possibility of additional drawings in its LGD estimates, it should do so in its EAD estimates.

5.2.8 When only the drawn balances of retail facilities have been securitised, AIs should ensure that they continue to hold required capital against their share (i.e. seller's interest) of undrawn balances related to the securitised exposures using the IRB approach to credit risk. This means that for such facilities, AIs should reflect the impact of CCFs in their EAD estimates rather than in the LGD estimates. For determining the EAD associated with the seller's interest in the undrawn lines, the undrawn balances of securitised exposures would be allocated between the seller's and investors' interests on a pro rata basis, based on the proportions of the seller's and investors' shares of the securitised drawn balances. The investors' share of undrawn balances related to the securitised exposures is subject to the treatment described in "Weighting Framework for Asset Securitisation".

5.2.9 To the extent that foreign exchange and interest rate commitments exist within an AI's retail portfolio for IRB purposes, AIs are not permitted to provide their internal assessments of credit equivalent amounts. Instead, the rules for the **Standardised Approach** continue to apply.

6 Rules for equity exposures

6.1 Risk-weighted assets for equity exposures

6.1.1 Risk-weighted assets for equity exposures in the trading book are subject to requirements set out in the market risk capital adequacy regime.

6.1.2 AIs are allowed to use either a market-based approach or a PD/LGD approach to calculate risk-weighted assets for equity exposures held in the banking book, subject to meeting the relevant minimum requirements. AIs should also be able to demonstrate that the choice of the approach to be adopted is appropriate for their equity portfolios, made consistently, and in particular not determined by regulatory arbitrage considerations.

Market-based approach

6.1.3 Under this approach, AIs are permitted to calculate the minimum capital requirements for their banking book equity holdings using one or both of two separate and distinct methods: a simple risk weight method or an internal models

method. The method used should be consistent with the amount and complexity of the AI's equity holdings and commensurate with the overall size and sophistication of the AI.

6.1.4 AIs are permitted to employ different market-based approaches to different portfolios based on appropriate considerations and where they themselves use different approaches internally. In such cases, AIs should be able to demonstrate to the HKMA that the approaches employed are appropriate to their equity portfolios.

6.1.5 AIs are permitted to recognise guarantees but not collateral obtained on an equity position wherein the capital requirement is determined through use of the market-based approach.

Simple risk weight method

6.1.6 Under this method, a 300% risk weight is to be applied to equity holdings that are publicly traded and a 400% risk weight is to be applied to all other equity holdings. A publicly traded holding is defined as any equity security traded on a recognised stock exchange (see Part 3 of Schedule 1 to the Securities and Futures Ordinance for the list of recognised stock exchanges).

6.1.7 Short cash positions and derivative instruments held in the banking book are permitted to offset long positions in the same individual stocks provided that these instruments have been explicitly designated as hedges of specific equity holdings and that they have remaining maturities of at least one year. Other short positions are to be treated as if they are long positions with the relevant risk weight applied to the absolute value of each position. In the context of maturity mismatched positions, the methodology is that for corporate exposures (see paragraph 4.2.46 above and subsection 6.2 of "Credit Risk Mitigation under the Standardised Approach").

Internal models method

6.1.8 AIs may use internal risk measurement models to calculate the risk-based capital requirement. Under this alternative, AIs should hold capital equal to the potential loss on their equity holdings as derived by using internal value-at-risk models subject to the 99th percentile, one-tailed confidence interval of the difference between quarterly returns and an appropriate risk-free rate computed over a long-term sample period determined by AIs. The capital charge should be incorporated into an AI's capital adequacy ratio through the calculation of risk-weighted equivalent assets.

6.1.9 The risk weight used to convert holdings into risk-weighted equivalent assets is be calculated by multiplying the derived capital charge by 12.5 (i.e. the inverse of the minimum 8%

capital requirement). Capital charges calculated under the internal models method should be no less than the capital charges calculated under the simple risk weight method using a 200% risk weight for publicly traded equity holdings and a 300% risk weight for all other equity holdings. These minimum capital charges are calculated separately using the methodology of the simple risk weight method. Further, these minimum risk weights are to apply at the individual exposure level rather than at the portfolio level.

PD/LGD approach

6.1.10 The minimum requirements and methodology for the PD/LGD approach for equity exposures (including the equity of companies that are included in the retail asset class) are the same as those for the **Foundation IRB Approach** for corporate exposures, subject to the following specifications[33]:

- an AI's estimate of the PD of a corporate entity in which it holds an equity position should satisfy the same requirements as the AI's estimate of the PD of a corporate entity where the AI holds debt[34]. If an AI does not hold debt of the company in whose equity it has invested, and does not have sufficient information on the position of that company to be able to use the applicable definition of default in practice but meets the other standards, a 1.5 scaling factor will be applied to the risk weights derived from the corporate risk-weight function, given the PD set by the AI. If, however, the AI's equity holdings are material and it is permitted to use a PD/LGD approach for regulatory purposes but the AI has not yet met the relevant standards, the simple risk weight method under the market-based approach will apply.
- an LGD of 90% is assumed in deriving the risk weight for equity exposures.
- for these purposes, the risk weight is subject to a five-year maturity adjustment whether or not an AI is using the explicit approach to maturity elsewhere in its IRB portfolio.

6.1.11 Under the PD/LGD approach, minimum risk weights as set out in paragraphs 6.1.12 and 6.1.13 below apply. When the

[33] There is no advanced approach for equity exposures, given the 90% LGD assumption.

[34] In practice, if there are both an equity exposure and an IRB credit exposure to the same counterparty, a default on the credit exposure would thus trigger a simultaneous default for regulatory purposes on the equity exposure.

sum of UL and EL associated with equity exposure results in less capital than would be required from application of one of the minimum risk weights, the minimum risk weights should be used. In other words, the minimum risk weights should be applied, if the risk weights calculated according to paragraph 6.1.10 above plus the EL associated with the equity exposure multiplied by 12.5 are smaller than the applicable minimum risk weights.

6.1.12 A minimum risk weight of 100% applies to the following types of equities as long as the portfolio is managed in the manner outlined below:

- public equities where the investment is part of a long-term customer relationship, any capital gains are not expected to be realised in the short term and there is no anticipation of (above trend) capital gains in the long term. It is expected that in almost all cases, AIs will have lending and/or general banking relationships with the portfolio company so that the estimated PD is readily available. Given their long-term nature, specification of an appropriate holding period for such investments merits careful consideration. In general, it is expected that an AI will hold the equity over the long term (at least five years).
- private equities where the returns on the investment are based on regular and periodic cash flows not derived from capital gains and there is no expectation of future (above trend) capital gain or of realising any existing gain.

6.1.13 For all other equity positions, including net short positions (as defined in paragraph 6.1.7 above), capital charges calculated under the PD/LGD approach should be no less than the capital charges calculated under a simple risk weight method using a 200% risk weight for publicly traded equity holdings and a 300% risk weight for all other equity holdings.

6.1.14 The maximum risk weight for the PD/LGD approach for equity exposures is 1250%. This maximum risk weight can be applied if the risk weights calculated according to paragraph 6.1.10 above plus the EL associated with the equity exposure multiplied by 12.5 exceed the 1250% risk weight. Alternatively, AIs may deduct the entire amount of equity exposure, assuming it represents the EL amount, from capital base.

6.1.15 Hedging for PD/LGD equity exposures is, as for corporate exposures, subject to an LGD of 90% on the exposure to the provider of the hedge. For these purposes equity positions will be treated as having a five-year maturity.

Exclusions to the market-based and PD/LGD approaches

6.1.16 Equity holdings of an AI can be excluded from the IRB treatment based on materiality. The equity exposures of an AI are considered as material if their aggregate value exceeds, on average over the prior year, 10% of an AI's core capital and supplementary capital. This materiality threshold is lowered to 5% of an AI's core capital and supplementary capital if the equity portfolio consists of less than ten individual holdings.

6.1.17 Equity holdings excluded from the IRB treatment will be subject to the capital charges required under the **Standardised Approach**.

6.2 Risk components

6.2.1 In general, the measure of an equity exposure on which capital requirements are based is the value presented in the financial statements, which depending on accounting standards and regulatory practices of the relevant jurisdiction where the equity is listed or its issuer is incorporated, may include revaluation gains. Thus, for example, equity exposure measures will be:

- for investments held at fair value with changes in value flowing directly through income and into regulatory capital, exposure is equal to the fair value presented in the balance sheet.

- for investments held at fair value with changes in value not flowing through income but into a separate component of equity, exposure is equal to the fair value presented in the balance sheet[35].

- for investments held at cost, exposure is equal to the cost presented in the balance sheet.

6.2.2 Holdings in funds containing both equity investments and other non-equity types of investments can be either treated, in a consistent manner, as a single investment based on the majority of the fund's holdings or, where possible, as separate and distinct investments in the fund's component holdings based on a look-through approach.

6.2.3 Where only the investment mandate of the fund is known, the fund can still be treated as a single investment. For this purpose, it is assumed that the fund first invests, to the

[35] This does not affect the existing 70% cap on revaluation surplus for inclusion as supplementary capital in the capital base.

maximum extent allowed under its mandate, in the asset classes attracting the highest capital requirement, and then continues making investments in descending order until the maximum total investment level is reached. The same approach can also be used for the look-through approach, but only where an AI has rated all the potential constituents of such a fund.

7 Rules for purchased receivables

7.1 Risk-weighted assets for default risk

7.1.1 For receivables belonging unambiguously to one asset class, the risk weight for default risk is based on the risk-weight function applicable to that particular exposure type, as long as AIs can meet the qualification standards for this particular risk-weight function. For example, if AIs cannot comply with the standards for QRRE (defined in paragraph 2.5.9 above), they should use the risk-weight function for other retail exposures. For hybrid pools containing a mixture of exposure types, if the purchasing AI cannot separate the exposures by type, the risk-weight function producing the highest capital requirements for the exposure types in the receivable pool applies.

Purchased retail receivables

7.1.2 For purchased retail receivables, the purchasing AI should meet the risk quantification standards for retail exposures but can utilise external and internal reference data to estimate the PDs and LGDs. The estimates for PD and LGD (or EL) should be calculated for the receivables on a stand-alone basis; that is, without regard to any assumption of recourse or guarantees from the seller or other parties.

Purchased corporate receivables

7.1.3 For purchased corporate receivables, the purchasing AI should apply the risk quantification standards for corporate exposures under the bottom-up approach.

7.2 Risk-weighted assets for dilution risk

7.2.1 Dilution refers to the possibility that the amount of a receivable is reduced through cash or non-cash credits to the receivable's obligor[36]. For both corporate and retail

[36] Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the borrower to a receivable's obligor, and any payment or promotional discounts offered by the borrower (e.g. a credit for cash payments within 30 days).

receivables, unless the purchasing AI can demonstrate to the HKMA that the dilution risk it faces is immaterial, the treatment of dilution risk should be the following: at the level of individual receivables making up the pool (the bottom-up approach), the purchasing AI will estimate the one-year EL for dilution risk, also expressed in percentage of the amount of receivables. AIs can utilise external and internal data to estimate EL. As with the treatment for default risk, this estimate should be computed on a stand-alone basis; that is, under the assumption of no recourse or other support from the seller or third-party guarantors.

7.2.2 For the purpose of calculating the risk weights for dilution risk, the corporate risk-weight function should be used with the following settings: the PD should be set equal to the estimated EL, and the LGD should be set at 100%. An appropriate maturity treatment applies when determining the capital requirement for dilution risk. If an AI can demonstrate that the dilution risk is appropriately monitored and managed to be resolved within one year, the HKMA may allow the AI to apply a one-year maturity.

7.2.3 This treatment will be applied regardless of whether the underlying receivables are corporate or retail exposures.

7.3 Treatment of purchase price discounts for receivables

7.3.1 In many cases, the purchase price of receivables will reflect a discount (not to be confused with the concept of discount defined in paragraphs 4.2.27 and 5.2.5 above) that provides first loss protection for default losses, dilution losses or both (see "Weighting Framework for Asset Securitisation"). To the extent that a portion of such a purchase price discount will be refunded to the seller, this refundable amount may be treated as first loss protection under the IRB securitisation framework. Non-refundable purchase price discounts for receivables do not affect either the calculation of EL and provisions in section 8 below or the calculation of risk-weighted assets.

7.3.2 When collateral or partial guarantees obtained on receivables provide first loss protection (collectively referred to as mitigants in this paragraph), and these mitigants cover default losses, dilution losses, or both, they may also be treated as first loss protection under the IRB securitisation framework (see "Weighting Framework for Asset Securitisation"). When the same mitigant covers both default and dilution risk, AIs using the Supervisory Formula that are able to calculate an exposure-weighted LGD should do so as defined in "Weighting Framework for Asset Securitisation".

7.4 Recognition of credit risk mitigants

7.4.1 Credit risk mitigants will be recognised generally using the same type of framework as set out in paragraphs 4.2.19 to 4.2.26 above[37]. In particular, a guarantee provided by the seller or a third party will be treated using the existing IRB rules for guarantees, regardless of whether the guarantee covers default risk, dilution risk, or both.

7.4.2 If the guarantee covers both the pool's default risk and dilution risk, AIs should substitute the risk weight for an exposure to the guarantor in place of the pool's total risk weight for default and dilution risk.

7.4.3 If the guarantee covers only default risk or dilution risk, but not both, AI should substitute the risk weight for an exposure to the guarantor in place of the pool's risk weight for the corresponding risk component (default or dilution). The capital requirement for the other component will then be added.

7.4.4 If the guarantee covers only a portion of the default and/or dilution risk, the uncovered portion of the default and/or dilution risk will be treated as per the existing CRM rules for proportional or tranched coverage (i.e. the risk weights of the uncovered risk components will be added to the risk weights of the covered risk components) (see paragraphs 5.4.1 and 5.4.11 of "Credit Risk Mitigation under the Standardised Approach").

8 Treatment of expected losses and recognition of provisions

8.1 Calculation of expected losses

8.1.1 AIs should sum the EL amount (defined as EL multiplied by EAD) associated with their exposures (excluding the EL amount associated with equity exposures under the PD/LGD approach and securitisation exposures) to obtain a total EL amount. While the EL amount associated with equity exposures subject to the PD/LGD approach is excluded from the total EL amount, paragraphs 8.1.2 and 8.3.4 below apply to such exposures. The treatment of EL for securitisation exposures is described in "Weighting Framework for Asset Securitisation".

[37] AIs may recognise guarantors that are internally rated and associated with a PD equivalent to better than A- under the **Foundation IRB Approach** for the purposes of determining capital requirements for dilution risk.

Expected loss for exposures other than SL subject to the supervisory slotting criteria

8.1.2 AIs should calculate the EL as PD x LGD for corporate, sovereign, bank and retail exposures not in default. For corporate, sovereign, bank and retail exposures that are in default, AIs should use their best estimate of EL as defined in paragraph 4.5.5 of "Minimum Requirements for Risk Quantification under IRB Approach", and AIs on the **Foundation IRB Approach** should use the supervisory LGD. For SL exposures subject to the supervisory slotting criteria, the EL is calculated as described in paragraph 8.1.4 below. For equity exposures subject to the PD/LGD approach, the EL is calculated as PD x LGD unless paragraphs 6.1.11 to 6.1.14 above apply. Securitisation exposures do not contribute to the EL amount, as set out in "Weighting Framework for Asset Securitisation". For all other exposures, the EL is zero.

Expected loss for SL exposures subject to the supervisory slotting criteria

8.1.3 For SL exposures subject to the supervisory slotting criteria, the EL amount is determined by multiplying by 8% the risk-weighted assets produced from the appropriate risk weights, as specified in the following paragraph, multiplied by EAD.

8.1.4 The risk weights for SL are as follows:

Strong	Good	Satisfactory	Weak	Default
5%	10%	35%	100%	625%

The HKMA may allow AIs to assign preferential risk weights to other SL exposures falling into the "strong" and "good" supervisory categories as outlined in paragraph 4.1.8 above. The corresponding EL risk weight is 0% for "strong" exposures, and 5% for "good" exposures.

8.2 Calculation of provisions

Exposures subject to the IRB Approach

8.2.1 Total eligible provisions are defined as the sum of all provisions (e.g. specific provisions, partial write-offs, portfolio-specific general provisions such as country risk provisions or general provisions[38]) that are attributed to

[38] AIs adopting the Hong Kong Accounting Standard 39 or other similar standard may wish to note that the accounting changes arising therefrom could have implications on the scope and extent of general provisions to be included in Supplementary Capital under the revised capital adequacy framework. The

exposures treated under the IRB Approach. In addition, total eligible provisions may include any discounts on defaulted assets. Specific provisions set aside against equity and securitisation exposures should not be included in total eligible provisions.

Portion of exposures subject to the Standardised Approach to credit risk

8.2.2 AIs using the **Standardised Approach** for a portion of their credit exposures, either on a transitional basis, or on a permanent basis if the exposures subject to the **Standardised Approach** are immaterial, should determine the portion of general provisions attributed to the standardised or IRB treatment of provisions (see "Calculation of Capital Base"[39]) according to the methods outlined in paragraphs 8.2.3 and 8.2.4 below.

8.2.3 AIs should generally attribute total general provisions on a pro-rata basis according to the proportion of credit risk-weighted assets subject to the **Standardised Approach** and **IRB Approach**. However, when one approach to determining credit risk-weighted assets (i.e. the **Standardised Approach** or **IRB Approach**) is used exclusively within an entity, general provisions booked within the entity using the **Standardised Approach** may be attributed to the standardised treatment. Similarly, general provisions booked within entities using the IRB Approach may be attributed to the total eligible provisions as defined in paragraph 8.2.1 above.

8.2.4 The HKMA may, on a case-by-case basis, consider whether there are particular circumstances that justify an AI using its internal allocation methodology for allocating general provisions for recognition in capital under either the **Standardised Approach** or **IRB Approach**. AIs should obtain the HKMA's prior approval before such a method can be used.

8.3 Treatment of expected losses and provisions

8.3.1 AIs using the IRB Approach should compare the amount of total eligible provisions (as defined in paragraph 8.2.1 above) with the total EL amount as calculated within the **IRB Approach** (as defined in paragraph 8.1.1 above). In addition, where an AI is also subject to the **Standardised**

HKMA will provide details of how the regulatory reporting of general provisions will be affected after the policy decisions are finalised, taking into account any further guidance from the Basel Committee on Banking Supervision and relevant comments from the banking industry.

[39] To be issued

Approach to credit risk for a portion of its credit exposures, general provisions (as explained in paragraphs 8.2.2 to 8.2.4 above) can be included in an AI's supplementary capital subject to the limit of 1.25% of risk-weighted assets.

8.3.2 Where the total EL amount exceeds total eligible provisions, AIs should deduct the difference from the capital base.

8.3.3 Where the total EL amount is less than total eligible provisions, the HKMA would generally allow AIs to recognise the difference in supplementary capital up to a maximum of 0.6% of credit risk-weighted assets. In addition, a 70% cap[40] is tentatively set on the "surplus" provisions (i.e. the amount of total eligible provisions in excess of total EL) which can be included in supplementary capital.

8.3.4 The EL amount for equity exposures under the PD/LGD approach is deducted from the capital base (see paragraph 6.1.14 above). Provisions or write-offs for equity exposures under the PD/LGD approach will not be used in the calculation of EL and provisions calculation. The treatment of EL and provisions related to securitisation exposures is outlined in "Weighting Framework for Asset Securitisation".

9 Scaling factor for risk-weighted assets

9.1 Application of scaling factor

9.1.1 In determining the minimum capital requirements for the IRB Approach, the HKMA will apply a scaling factor – which could be either greater than or less than one – to the total amount of credit risk-weighted assets calculated based on the rules set out for all asset classes under the IRB Approach. The use of this scaling factor is to broadly maintain the aggregate level of minimum capital requirements derived from the revised capital adequacy framework.

9.1.2 The current best estimate of the scaling factor is 1.06. In applying this scaling factor, AIs should multiply the total amount of credit risk-weighted assets calculated under the IRB Approach by 1.06 for the computation of the capital adequacy ratio.

[40] The HKMA will determine the appropriate level of limitations on "surplus" provisions when more information is available for assessing the potential impact of recognising such provisions in AIs' supplementary capital after they have put the IRB systems in place. The HKMA will consult the industry on any proposed changes after such an assessment is made (probably during the parallel run period in 2006).

9.1.3 The HKMA will finalise the size of the scaling factor in 2006, with reference to the results of the impact studies conducted by the Basel Committee on Banking Supervision.

Table 1: Risk weights for cash items

The following types of assets are regarded as cash items which are subject to a risk weight lower than 100%:

0% risk weight

- Notes and coins
- Holdings of HKSAR Government certificates of indebtedness for note issue
- All gold bullion held in the AI's own vaults or, on an allocated basis, in the vaults of other institutions to the extent that, in both cases, it is backed by gold bullion liabilities
- All receivable funds arising from the sale of securities, for the AI's own account or on behalf of a customer, which are outstanding up to and including the fifth working day after the due settlement date
- All receivable funds arising from the purchase of securities, on behalf of a customer, which are outstanding up to and including the fifth working day after the due settlement date

20% risk weight

- Cheques, drafts and other items drawn on other AIs or banks that are payable immediately upon presentation and that are in the process of collection

Table 2: Illustrative IRB risk weights

Asset Class:	Corporate Exposures		Residential Mortgages		Other Retail Exposures		Qualifying Revolving Retail Exposures	
LGD:	45%	45%	45%	25%	45%	85%	45%	85%
Maturity 2.5 years								
Turnover (HKD Mn)	500	50						
PD: 0.03%	14.44%	11.30%	4.15%	2.30%	4.45%	8.41%	0.98%	1.85%
0.05%	19.65%	15.39%	6.23%	3.46%	6.63%	12.52%	1.51%	2.86%
0.10%	29.65%	23.30%	10.69%	5.94%	11.16%	21.08%	2.71%	5.12%
0.25%	49.47%	39.01%	21.30%	11.83%	21.15%	39.96%	5.76%	10.88%
0.40%	62.72%	49.49%	29.94%	16.64%	28.42%	53.69%	8.41%	15.88%
0.50%	69.61%	54.91%	35.08%	19.49%	32.36%	61.13%	10.04%	18.97%
0.75%	82.78%	65.14%	46.46%	25.81%	40.10%	75.74%	13.08%	26.06%
1.00%	92.32%	72.40%	56.40%	31.33%	45.77%	86.46%	17.22%	32.53%
1.30%	100.95%	78.77%	67.00%	37.22%	50.80%	95.95%	21.02%	39.70%
1.50%	105.59%	82.11%	73.45%	40.80%	53.37%	100.81%	23.40%	44.19%
2.00%	114.86%	88.55%	87.94%	48.85%	57.99%	109.53%	28.92%	54.63%
2.50%	122.16%	93.43%	100.64%	55.91%	60.90%	115.03%	33.98%	64.18%
3.00%	128.44%	97.58%	111.99%	62.22%	62.79%	118.61%	38.66%	73.03%
4.00%	139.58%	105.04%	131.63%	73.13%	65.01%	122.80%	47.16%	89.08%
5.00%	149.86%	112.27%	148.22%	82.35%	66.42%	125.45%	54.75%	103.41%
6.00%	159.61%	119.48%	162.52%	90.29%	67.73%	127.94%	61.61%	116.37%
10.00%	193.09%	146.51%	204.41%	113.56%	75.54%	142.69%	83.89%	158.47%
15.00%	221.54%	171.91%	235.72%	130.96%	88.60%	167.36%	103.89%	196.23%
20.00%	238.23%	188.42%	253.12%	140.62%	100.28%	189.41%	117.99%	222.86%

Note:

1. The above table provides illustrative risk weights for UL calculated for the corporate asset class and the three retail sub-classes under the IRB Approach to credit risk. Each set of risk weights is produced using the appropriate risk-weight functions set out in this paper. The inputs used to calculate the illustrative risk weights include measures of PD, LGD, and an assumed M of 2.5 years.

2. A firm-size adjustment applies to exposures made to SME borrowers (defined as corporate exposures where the reported sales for the consolidated group of which the firm is a part is less than HKD500 million). Accordingly, the firm-size adjustment is made in determining the second set of risk weights provided in second column of corporate exposures given that the turnover of the firm receiving the exposure is assumed to be HKD50 million.

Table 3: Supervisory slotting criteria for specialised lending

Table 3.1 – Supervisory rating grades for project finance exposures

	Strong	Good	Satisfactory	Weak
I. 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

Table 3.1 – Supervisory rating grades for project finance exposures (cont'd)

	Strong	Good	Satisfactory	Weak
II. 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 of actual enforcement of contracts, collateral and security.
III. 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.

Table 3.1 – Supervisory rating grades for project finance exposures (cont'd)

	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

Table 3.1 – Supervisory rating grades for project finance exposures (cont'd)

	Strong	Good	Satisfactory	Weak
Off-take risk				
(a) If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of off-taker; 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.
IV. 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

Table 3.1 – Supervisory rating grades for project finance exposures (cont'd)

	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.
V. 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, etc)	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 3.2 – Supervisory rating grades for income-producing real estate exposures

	Strong	Good	Satisfactory	Weak
I. 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.

Table 3.2 – Supervisory rating grades for income-producing real estate exposures (cont'd)

	Strong	Good	Satisfactory	Weak
Cashflow 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 take-out 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.

Table 3.2 – Supervisory rating grades for income-producing real estate exposures (cont'd)

	Strong	Good	Satisfactory	Weak
II. Asset characteristics				
Location	Property is located in highly desirable location that is convenient to services that tenants desire.	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 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.

Table 3.2 – Supervisory rating grades for income-producing real estate exposures (cont'd)

	Strong	Good	Satisfactory	Weak
III. 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 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
IV. Security package				
Nature of Lien	Perfected first lien*	Perfected first lien*	Perfected first lien*	Ability of lender to foreclose is constrained.

Table 3.2 – Supervisory rating grades for income-producing real estate exposures (cont'd)

	Strong	Good	Satisfactory	Weak
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

**: 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.*

Table 3.3 – Supervisory rating grades for object finance exposures

	Strong	Good	Satisfactory	Weak
I. 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 world-wide basis; assets are highly liquid.	Market is world-wide 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
II. 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

Table 3.3 – Supervisory rating grades for object finance exposures (cont'd)

	Strong	Good	Satisfactory	Weak
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 enforcement of contracts, even If repossession might be long and/or difficult.	Poor or unstable legal and regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible.
III. 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
IV. Operational 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 re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset

Table 3.3 – Supervisory rating grades for object finance exposures (cont'd)

	Strong	Good	Satisfactory	Weak
V. 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 market for the object.	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.
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.
VI. Strength of sponsor				
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 re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market 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
VII. 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.

Table 3.3 – Supervisory rating grades for object finance exposures (cont'd)

	Strong	Good	Satisfactory	Weak
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 is limited.
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 3.4 – Supervisory rating grades for commodities finance exposures

	Strong	Good	Satisfactory	Weak
I. Financial strength				
Degree of over-collateralisation of trade	Strong	Good	Satisfactory	Weak
II. 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 mechanism - 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
III. 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.
IV. Strength of sponsor				
Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak

Table 3.4 – Supervisory rating grades for commodities finance exposures (cont'd)

	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.
V. 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

CRITERIA FOR TRANSITION TO IRB APPROACH

Hong Kong Monetary Authority
February 2005

CRITERIA FOR TRANSITION TO IRB APPROACH

CONTENTS

1. Introduction

1.1 Terminology

1.1.1 Abbreviations and other terms used in this paper have the following meanings:

- "PD" means the probability of default of a counterparty over one year.
- "LGD" means the loss incurred on a facility upon default of a counterparty relative to the amount outstanding at default.
- "EAD" means the expected gross exposure of a facility upon default of a counterparty.
- "IRB Approach" means Internal Ratings-based Approach.
- "**Foundation IRB Approach**" means that, in applying the IRB framework, AIs provide their own estimates of PD and use supervisory estimates of LGD and EAD, and, unless otherwise specified by the HKMA, are not required to take into account the effective maturity of credit facilities.
- "**Advanced IRB Approach**" means that, in applying the IRB framework, AIs use their own estimates of PD, LGD and EAD, and are required to take into account the effective maturity of credit facilities.
- "**Basic Approach**", in terms of credit risk capital measurement, means a methodology that is built upon the 1988 Basel Capital Accord with minor definitional changes.
- "**Standardised Approach**" means a methodology for calculating capital requirements for credit risk in a standardised manner, supported by credit assessments made by recognised external credit assessment institutions. It is the default option for calculating capital requirements for credit risk, except for AIs that have obtained the HKMA's approval to adopt other available options.
- "Asset classes" cover corporate, sovereign, bank, retail, equity and securitisation exposures.
- "Transition period" means, for the purpose of this paper, the three-year period from 1 January 2007 to 31 December 2009 to which certain transitional arrangements apply.

1.2 Application

1.2.1 The criteria set out in this paper are applicable to locally incorporated AIs which use or intend to use the IRB Approach to measure capital charges for credit risk.

1.2.2 In the case of AIs that are subsidiaries of foreign banking groups, the HKMA may, where appropriate, co-ordinate/consult with the home supervisors of those banking groups regarding the application of the criteria set out in this paper. Similarly, the HKMA may co-ordinate with the host supervisors of AIs which have maintained banking subsidiaries overseas.

1.3 Background and scope

1.3.1 The HKMA will offer various IRB approaches applicable to different asset classes to AIs that are capable of fulfilling the relevant requirements. In line with the implementation timetable recommended by the Basel Committee on Banking Supervision, the HKMA will make available for adoption by AIs the **Foundation IRB Approach** as from 1 January 2007[1] and the **Advanced IRB Approach** as from 1 January 2008.

1.3.2 As a general principle, the HKMA will not require or mandate any particular AI, or any type or group of AIs, to adopt the IRB Approach. In deciding whether to use the IRB Approach for capital adequacy purposes, AIs should conduct their own feasibility study and analysis of the associated costs and benefits, having regard to the diversity and complexity of their operations. Subject to meeting the minimum qualifying requirements, AIs should seek the HKMA's prior approval if they wish to use the IRB Approach in the calculation of capital.

1.3.3 This paper sets out the guiding principles for AIs to structure their rollout plans for the IRB Approach, and the criteria governing the following elements of implementation:

- the adoption of the IRB Approach across a banking group (including the requirements for a phased rollout);
- the minimum level of IRB coverage to be achieved;
- exemptions from IRB requirements for immaterial exposures;

[1] Other IRB approaches where there is no distinction between a foundation and an advanced approach for the respective asset class (such as that for retail exposures) will also be available for adoption by AIs as from 1 January 2007.

- migration across approaches;
- use of non-IRB approaches (i.e. the **Basic Approach** and/or the **Standardised Approach**) on a transitional basis; and
- other transitional arrangements regarding parallel run, capital floor and data requirements.

1.3.4 Other requirements relating to the qualitative and quantitative aspects of IRB systems and the application of those systems in the calculation of capital are contained in the following papers:

- "Minimum Requirements for Internal Rating Systems under IRB Approach";
- "Minimum Requirements for Risk Quantification under IRB Approach";
- "Weighting Framework for Credit Risk (IRB Approach)"; and
- "Weighting Framework for Asset Securitisation"[2].

1.3.5 AIs should ensure that their IRB rollout plans can adequately address the relevant requirements stipulated in the above papers. In considering whether their rollout plans are acceptable, the HKMA will also take into account the particular circumstances of individual AIs.

2. Rollout of the IRB Approach

2.1 General principles

2.1.1 The fundamental principle is that AIs adopting the IRB Approach should seek to apply this Approach across the entire banking group and to a critical mass of their banking book[3] credit risk-weighted assets ("RWAs") (see subsection 1.2 of "Weighting Framework for Credit Risk (IRB Approach)" for details) before they may start using the Approach for regulatory capital purposes. AIs wishing to adopt the IRB Approach should discuss and agree their rollout plans with the HKMA as soon as practicable (see also subsection 2.2 below).

2.1.2 In order to ensure that AIs are not adopting the IRB Approach prematurely, the HKMA would expect them to

[2] To be issued

[3] As the IRB Approach does not cover trading book exposures, AIs adopting this approach will be subject to the market risk capital adequacy regime for the reporting and calculation of capital charges against these exposures, irrespective of whether they meet the criteria for de minimis exemption from the market risk regime.

attain a certain level of IRB coverage as a prerequisite to using the Approach in the calculation of capital. Subsection 2.3 provides further elaboration of the IRB coverage requirement.

2.1.3 The HKMA recognises, however, that it may not always be practical or cost-effective for AIs to implement the IRB Approach across all asset classes and business units[4] at the same time or to extend the IRB Approach to some exposures in non-significant asset classes or business units that are immaterial in terms of size and perceived risk profile.

2.1.4 To address these practical issues, it is permissible for AIs to roll out the IRB Approach across the banking group by phase in some circumstances or to exclude certain immaterial exposures from adopting the IRB Approach, subject to the HKMA's prior approval. The relevant criteria are set out in subsections 2.2 and 2.4 respectively.

2.1.5 Whether AIs will be allowed to use the IRB Approach for capital adequacy purposes is subject to the HKMA being satisfied with their capability to meet various qualitative and quantitative requirements relating to internal rating systems and the estimation of PD/LGD/EAD, and the controls surrounding them. This will be validated by the HKMA through various means. It should however be stressed that the primary responsibility for validating and ensuring the quality of an AI's internal rating systems lies with its management.

2.1.6 The specific criteria set out in this paper (including those ratios or limits relating to minimum IRB coverage and exemptions for immaterial exposures) will be regarded by the HKMA as measures of acceptability for using or continuing to use the IRB Approach. As such, AIs would be expected to monitor compliance with the criteria on an ongoing basis. Where there are circumstances that may lead to non-compliance, AIs should produce a remedial plan and consult the HKMA as early as possible (see also paragraphs 2.3.3 to 2.3.5 below).

2.2 Rollout plan

General requirements

2.2.1 AIs wishing to use the IRB Approach for capital adequacy purposes should provide an implementation plan to the

[4] The HKMA does not intend to prescribe how a business unit should be defined. Individual AIs are expected to define the boundaries of their business units in a manner that is consistent with their operations and management structure. Examples of a business unit may include an AI's subsidiary or overseas branch, or a product division within the AI.

HKMA, specifying, among other things, the extent and timing for rolling out the IRB Approach across significant asset classes (or sub-classes in the case of retail) and business units.

2.2.2 The plan should be precise and realistic, and agreed with the HKMA. In particular, the HKMA needs to be satisfied with the following:

- the AI is capable of achieving an adequate level of IRB coverage upon adoption of the Approach;
- the most significant portfolios in terms of size and risk profile (including major subsidiaries[5] within the banking group) should be covered;
- in the case of a phased rollout, there should be reasonable assurance that the AI can migrate all remaining non-IRB exposures, except those subject to a permanent exemption, to the IRB Approach within its proposed timeframe (see also paragraphs 2.2.7 to 2.2.9 below). The sequence of migration should be feasible and justified by risk management and operational considerations;
- there is no suggestion that the AI is attempting to arbitrage between different capital treatments (e.g. by putting each asset class under whichever capital treatment produces the lowest capital charge for that particular class of asset, or using intra-group transactions for a similar purpose[6]).

2.2.3 As a general rule, when an AI adopts the IRB Approach for an asset class within a particular business unit (or in the case of retail exposures for an individual sub-class), the AI should apply the IRB Approach to all exposures within that asset class (or sub-class) in that unit.

2.2.4 In addition, once an AI has adopted the IRB Approach for corporate exposures, it will be required to adopt the IRB Approach for the specialised lending ("SL") sub-classes within the corporate asset class. Given the data limitations associated with SL exposures, an AI may use the supervisory slotting criteria approach for one or more of the SL sub-classes.

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[5] The HKMA would generally expect an AI to apply the IRB Approach to all of its authorized subsidiaries on a solo and consolidated basis. Any exceptions to this should be prior consulted with the HKMA.

[6] During the rollout period, the HKMA will ensure, possibly through the supervisory review process, that no capital relief will be granted for intra-group transactions which are designed to reduce a group's aggregate capital charge by transferring credit risk among entities on different approaches (e.g. basic, standardised and IRB). These transactions include, but are not limited to, asset sales or cross guarantees.

2.2.5 Once agreed with the HKMA, AIs should demonstrate reasonable adherence to the rollout plan, and promptly inform the HKMA of any subsequent changes to the plan, including any significant slippage or deviations. AIs' entry into new products and markets as well as major activities in mergers or acquisitions may require revisions to previously agreed rollout plans, if these cannot be accommodated within the original implementation timetable. Such changes will, in general, be acceptable to the HKMA, as long as there is a reasonable rationale.

2.2.6 Where the HKMA considers that an AI is not making satisfactory progress, it may require the AI to reassess the feasibility of its original rollout plan. In the event that the IRB rollout is likely to be deferred, the AI should provide the HKMA with a remedial plan to deal with the situation.

Phased rollout

2.2.7 AIs may be allowed to adopt a phased rollout of the IRB Approach across the banking group within the transition period from 2007 to 2009, subject to the HKMA being satisfied with their rollout plans (see paragraphs 2.2.1 to 2.2.6 above). Phased rollout after the transition period will not generally be allowed.

2.2.8 AIs adopting a phased rollout should have achieved a certain level of IRB coverage (i.e. at least 75% of total banking book credit RWAs) before they can start using the IRB Approach for capital calculation. By the end of the transition period, all of their non-exempt exposures should have been migrated to the IRB Approach. See subsection 2.3 below for more details.

2.2.9 The above provisions for phased rollout mainly apply to the **Foundation IRB Approach**. AIs that have the capability to move straight to the **Advanced IRB Approach** without first implementing the **Foundation IRB Approach** are expected to implement the Approach in one go.

2.3 Minimum level of IRB coverage

2.3.1 To qualify for using the IRB Approach for capital measurement, AIs should be able to roll out the Approach to exposures that comprise at least 85%[7] of the total banking book credit RWAs. The IRB coverage ratio should be applied on both a solo and consolidated basis, and calculated based on the approaches in use at the

[7] Subject to the remaining non-IRB exposures being exempted by the HKMA as immaterial exposures

time of adoption, i.e. $RWAs_{(IRB)} / [RWAs_{(IRB)} + RWAs_{(Non-IRB)}] \geq 85\%$.

2.3.2 AIs may be allowed to transition to the IRB Approach before reaching the 85% coverage level if they can satisfy the criteria for adopting phased rollout (see subsection 2.2 above). In such cases, the requisite level of IRB coverage should be at least 75% at the outset, to be increased to at least 85% at the end of the rollout period.

2.3.3 AIs are expected to monitor compliance with the above coverage ratio(s) not only at the outset of adopting the IRB Approach but also on a continuing basis. The HKMA may however permit an AI's temporary non-compliance with the coverage requirement due to special circumstances. For example, an AI may have completed a major acquisition of a non-IRB bank, or an exempted immaterial portfolio may have become significant in size, and time is needed to convert the operations concerned to IRB compliant status. In such cases, the AI should submit a plan to the HKMA to demonstrate that compliance will be achieved within a reasonable period of time.

2.3.4 Failure to meet the required IRB coverage without acceptable reasons or to produce and satisfactorily implement a suitable remedial plan will lead the HKMA to reconsider an AI's eligibility for the IRB Approach.

2.3.5 During the period of non-compliance, the HKMA may, depending on the circumstances of each case, consider whether it is necessary to:

- require more capital to be held by the AI under the supervisory review process if the non-IRB exposures carry higher risk; or
- take any other supervisory action (such as requiring the AI to reduce its credit exposures) as appropriate.

2.4 Exemptions for immaterial exposures

2.4.1 Exposures in certain asset classes (or sub-classes in the case of retail) or business units may be exempted by the HKMA from the IRB Approach permanently if AIs can demonstrate to the HKMA's satisfaction that the exposures in such asset class, sub-class or business unit[8] are immaterial in terms of size and risk profile.

[8] Where necessary, AIs may have to show how the definition for particular business units seeking IRB exemption is appropriate based on their business operations and management structure.

2.4.2 Capital requirements for the exempted exposures will be calculated based on the **Standardised Approach**. However, the HKMA may consider under the supervisory review process whether more capital should be held for some of these exposures that seem to carry higher risk (e.g. risky equity investments).

2.4.3 In considering whether exemption should be granted, the HKMA will have regard to the following materiality limits (calculated on both a solo and consolidated basis):

- the aggregate amount of immaterial exposures that can be exempted from the IRB Approach is subject to an overall limit of 15% of an AI's total banking book credit RWAs;
- for non-equity exposures, the aggregate amount of risk-weighted exposures of a class of assets (or sub-class in the case of retail) should not exceed a sub-limit of 10% of an AI's Core Capital and Supplementary Capital[9] if such exposures were to be regarded as immaterial; and
- for equity exposures, the aggregate value, on average over the past 12 months, should not exceed 10% of an AI's Core Capital and Supplementary Capital if such exposures were to be regarded as immaterial. This sub-limit is lowered to 5% if the equity portfolio consists of less than ten individual holdings (see paragraph 6.1.16 of "Weighting Framework for Credit Risk (IRB Approach)").

2.4.4 Exposures within the above limits will generally be exempted, subject to vetting by the HKMA. Nevertheless, the HKMA reserves the right to approve or disapprove such exemptions, having regard to other considerations. In particular, AIs should note that they are expected to make use of this exemption only in case of need. The 15% overall limit should not be seen by AIs as a target level of exemption to work towards. The HKMA has no intention to allow exemption for any exposures to which an AI clearly has the ability to apply the IRB Approach without incurring significant cost or effort. AIs should also seek to move portfolios that are initially exempted from the IRB Approach onto more advanced methodologies when they are in a position to do so.

2.4.5 The HKMA may ask individual AIs to provide other necessary information to support their exemption request (e.g. the loss experience of the portfolios to be exempted in the past few years).

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[9] As defined in the Third Schedule to the Banking Ordinance

2.4.6 The HKMA may revoke previously granted exemptions if the exempted portfolios become significant in size or risk profile. In such cases, AIs will need to move such exposures onto the IRB Approach and propose a reasonable timeframe for doing so.

2.4.7 AIs should monitor compliance with the above limits not only at the time of adoption but also on a continuous basis. The provisions set out in paragraphs 2.3.3 to 2.3.5 above will similarly apply to cases of non-compliance with the above limits.

2.5 Use of non-IRB approaches

Foundation IRB Approach

2.5.1 AIs with a definite plan to adopt the **Foundation IRB Approach** during the three-year period up to the end of 2009 may be allowed to use the **Basic Approach**[10] on a transitional basis, subject to the HKMA being satisfied with their rollout plans (see also subsection 2.2 above).

2.5.2 Use of the **Basic Approach** for the above purpose will be confined to the transition period from 2007 to 2009. An extension of the use period will only be granted by the HKMA in exceptional circumstances. By the end of 2009, all IRB-exempt exposures and non-exempt exposures should have been migrated to the **Standardised Approach** and the **Foundation IRB Approach** respectively.

2.5.3 In some cases, AIs may seek to use a combination of the **Basic Approach** and **Standardised Approach** for their remaining non-IRB exposures during the transition period. AIs will need to satisfy the HKMA that this arrangement will not result in arbitrage between different capital treatments and is supported by valid operational considerations. For example, AIs may wish to move straight to the **Standardised Approach** at the beginning of the transition period for certain IRB-exempt exposures approved by the HKMA.

2.5.4 AIs that are planning to use the **Basic Approach** prior to adopting the IRB Approach will need to provide the HKMA with adequate assurance of their capability to deliver the IRB Approach as planned. Otherwise, they may be required to use the **Standardised Approach** instead before moving to the IRB Approach.

2.5.5 **Annex 1** gives some illustrative examples of the criteria for phased rollout that involves the use of the **Basic**

[10] Alternatively, AIs may choose to use the **Standardised Approach** (i.e. the default option) for capital calculation before they are ready to move to the IRB Approach.

Approach (and/or the **Standardised Approach** where applicable) during the transition period.

Advanced IRB Approach

2.5.6 AIs wishing to adopt the **Advanced IRB Approach** are expected to move straight to that Approach as from 1 January 2008. In other words, they should have at least 85% (see paragraph 2.3.1 above) of total banking book credit RWAs on the **Advanced IRB Approach** at that time. These AIs will normally be allowed to use the **Basic Approach** for the year of 2007, subject to the HKMA being satisfied with the rollout plan.

2.5.7 Paragraph 2.5.3 similarly applies to AIs that wish to use a combination of the **Basic Approach** and the **Standardised Approach** in 2007.

2.6 Migration across approaches

2.6.1 For those AIs that are building IRB systems from scratch, it may be more practicable for them to start with the **Foundation IRB Approach** rather than going straight to the **Advanced IRB Approach**. The possibility of moving straight to the **Advanced IRB Approach** is, however, not ruled out if the AIs concerned can meet the more stringent qualifying criteria and standards.

2.6.2 AIs that have a plan to move onto the **Advanced IRB Approach** after having implemented the **Foundation IRB Approach** should discuss and agree their plan and timetable with the HKMA. While the HKMA may allow these AIs to roll out the **Advanced IRB Approach** by phase[11] (subject to meeting the relevant requirements for individual asset classes), the rollout should not be prolonged or patchy. In general, the whole migration process should be completed within three years. AIs may also choose to remain on the **Foundation IRB Approach** permanently.

2.6.3 AIs adopting the IRB Approach are expected to continue to employ the Approach. A return to the **Standardised Approach** or the **Foundation IRB Approach** from a more advanced approach will be permitted only in exceptional circumstances (e.g. divestiture of a large fraction of the AI's credit-related business) and should be approved by the HKMA.

[11] It should also be noted that no capital relief will be granted for intra-group transactions which are designed to reduce a group's aggregate capital charge by transferring credit risk among entities on the **Foundation IRB Approach** or the **Advanced IRB Approach**. These transactions include, but are not limited to, asset sales or cross guarantees.

3. Transitional arrangements

3.1 Parallel run

3.1.1 AIs adopting the **Foundation IRB Approach** on 1 January 2007 are required to provide parallel calculations of credit risk capital requirement based on the **current Accord** [12] and the **Foundation IRB Approach** for the year of 2006, covering the reporting dates of 31 March, 30 June, 30 September and 31 December.

3.1.2 AIs adopting the **Advanced IRB Approach** on 1 January 2008 are required to provide parallel calculations of credit risk capital requirement based on the **Basic Approach** and the **Advanced IRB Approach** for the year of 2007, covering the reporting dates of 31 March, 30 June, 30 September and 31 December.

3.1.3 AIs adopting the IRB Approach, whether **Foundation** or **Advanced**, on other dates would also be expected to conduct a similar parallel run prior to adoption. Some illustrative examples are set out in **Annex 2**.

3.1.4 For AIs adopting the IRB Approach after 31 December 2009, such parallel run will be with the **Standardised Approach**. For AIs that are migrating from the **Foundation IRB Approach** to the **Advanced IRB Approach**, the parallel run will be with the **Foundation IRB Approach**.

3.1.5 In order to obtain a meaningful comparison, AIs should have a material portion of their total banking book credit RWAs on IRB (around 75%) at the start of the parallel run. Subject to the HKMA's prior approval, a lower percentage (say, at least 60%) may be acceptable for the first two quarters of the parallel run if the AI concerned can provide reasonable assurance that the target coverage can be reached within an agreed timeframe. The HKMA may, however, consider extending the period of the parallel run if there is subsequent slippage in the AI's implementation efforts.

3.2 Capital floor

3.2.1 AIs adopting the IRB Approach, whether **Foundation** or **Advanced**, are subject to a capital floor for the first three years after they have adopted the IRB Approach for capital adequacy purposes. This also applies to AIs

[12] The parallel calculation is based on the Third Schedule to the Banking Ordinance. The basis for calculation will, however, be changed to the **Basic Approach** after the end of 2006.

migrating from the **Foundation IRB Approach** to the **Advanced IRB Approach**. The use of the capital floor is to prevent a sudden fall in capital charges as a result of the change in how the RWAs are measured.

3.2.2 AIs which are subject to the capital floor should calculate the difference between:

(i) the floor as defined in paragraphs 3.2.3 – 3.2.5 below; and

(ii) the amount as calculated under paragraph 3.2.6 below.

If the floor amount is larger, AIs are required to add 12.5 times the difference to RWAs. **Annex 3** provides two numerical examples to illustrate how the floor works.

3.2.3 For AIs adopting the IRB Approach within the transition period, the capital floor is derived by applying an adjustment factor to the following amount:

(i) 8% of total RWAs[13] as calculated for credit risk under the **Basic Approach** and for market risk under the approach in use (e.g. the **Standardised Approach** or **Internal Models Approach**). Total RWAs are determined by multiplying the capital requirements for market risk by 12.5 and adding the resulting figures to the sum of RWAs for credit risk;

(ii) plus deductions from Core Capital and Supplementary Capital;

(iii) less the amount of general provisions[14] that may be recognised in Supplementary Capital.

3.2.4 For AIs adopting the IRB Approach after the transition period, the calculation of the capital floor is mainly based on the approach adopted prior to the use of the IRB Approach for the calculation of RWAs for credit risk (i.e. the **Standardised Approach**) and the approaches in use for market risk and operational risk. In the case of AIs moving from the **Foundation IRB Approach** to the **Advanced IRB Approach**, the calculation of RWAs for

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[13] To facilitate a closer comparison with the capital calculation under the **current Accord**, AIs adopting the IRB Approach within the transition period are not required to include the RWAs calculated for operational risk (e.g. under the **Basic Indicator Approach**) for the calculation of the floor.

[14] AIs adopting the Hong Kong Accounting Standard 39 or other similar standard may wish to note that the accounting changes arising therefrom could have implications on the scope and extent of general provisions to be included in Supplementary Capital under the revised capital adequacy framework. The HKMA will provide details of how the regulatory reporting of general provisions will be affected after the policy decisions are finalised, taking into account any further guidance from the Basel Committee on Banking Supervision and relevant comments from the banking industry.

credit risk will be based on the **Foundation IRB Approach**.

3.2.5 The adjustment factors for AIs adopting the IRB Approach within or after the transition period are set out in the table below:

Date of IRB implementation	1st year of implementation	2nd year of implementation	3rd year of implementation
Within transition period	95%	90%	80%
After transition period[15]	90%	80%	70%

3.2.6 In the years in which the floor applies, AIs should also calculate:

(i) 8% of total RWAs as calculated under the various approaches in use for credit risk, market risk and operational risk. Total RWAs are determined by multiplying the capital requirements for market risk and operational risk by 12.5 and adding the resulting figures to the sum of RWAs for credit risk;

(ii) less the surplus amount recognised in Supplementary Capital (if total eligible provisions exceed total expected loss) or plus the shortfall amount (if total eligible provisions fall below total expected loss) as described in subsection 8.3 of "Weighting Framework for Credit Risk (IRB Approach)";

(iii) plus other deductions from Core Capital and Supplementary Capital.

Where an AI uses the **Basic Approach** and/or **Standardised Approach** to credit risk for any portion of its exposures, the AI also needs to exclude general provisions that may be recognised in Supplementary Capital for that portion from the amount as calculated above.

3.2.7 Should issues or concerns emerge during the three-year period of applying the capital floors, the HKMA will seek to take appropriate measures to address them and, in particular, will be prepared to keep the floors in place beyond the third year if necessary.

3.3 Data requirements

[15] Lower adjustment factors are used to take account of operational risk capital charges on both sides of the calculation.

3.3.1 The HKMA recognises that AIs wishing to adopt the IRB Approach may need an extended period of time to develop or enhance their IRB systems to come into line with the minimum requirements and to start building up the required data for estimation of PD/LGD/EAD.

3.3.2 For (i) corporate, sovereign and bank exposures under the **Foundation IRB Approach**, (ii) retail exposures and (iii) the **PD/LGD Approach** to equity, the HKMA will apply the transitional requirement of a minimum of two years of data at the time of adopting the IRB Approach to AIs that can implement such an approach during the transition period from 2007 to 2009[16]. This requirement will increase by one year for each of the three years after end-2009. The table below sets out the arrangements:

Item	**Requirement**	**Transitional Arrangement**
Observation period for PD under **Foundation IRB Approach** for corporate, bank and sovereign exposures	At least 5 years	2 years if implementation is within the period from 1 January 2007 to 31 December 2009, increasing by 1 year for each subsequent year after end-2009 (i.e. to reach 5 years by end-2012)
Observation period for PD under **Advanced IRB Approach** for corporate, bank and sovereign exposures	At least 5 years	No transitional arrangement
Observation period for LGD/EAD under **Advanced IRB Approach** for corporate, bank and sovereign exposures	At least 7 years	No transitional arrangement
Observation period for PD/LGD/EAD for retail exposures	At least 5 years	2 years if implementation is within the period from 1 January 2007 to 31 December 2009, increasing by 1 year for each subsequent year after end-2009 (i.e. to reach 5 years by end-2012)

3.3.3 As a two-year data observation period is unlikely to be enough to capture default data during a full credit cycle, AIs are expected to exercise conservatism in the assignment of borrower ratings and estimation of risk

[16] There are no transitional data arrangements for the **Advanced IRB Approach** and the **Market-based Approach** to equity.

characteristics. Also, they need to demonstrate and document how they have done this.

Annex 1: Illustration of phased rollout during the transition period

(i) Bank A: Using the Basic Approach ("BA") during the transition period

	2007		2008		2009	
Asset class	**Type of Approach**	**%of credit RWAs**	**Type of Approach**	**%of credit RWAs**	**Type of Approach**	**%of credit RWAs**
Corporate	BA	30%	IRB	27%	IRB	28%
Bank	BA	22%	BA	19%	IRB	19%
Sovereign*	BA	2%	BA	3%	SA	2%
Retail	IRB	45%	IRB	50%	IRB	50%
Equity*	BA	1%	BA	1%	SA	1%
	IRB	45%	IRB	77%	IRB	97%
	BA	55%	BA	23%	SA	3%
	Total	100%	Total	100%	Total	100%
	IRB status	**No**	**IRB status**	**Yes**	**IRB status**	**Yes**

**: Asset classes that are exempted by the HKMA from the application of the IRB Approach*

2007

- Bank A is not qualified to use the IRB Approach for capital calculation because its IRB coverage cannot meet the minimum threshold of 75%.
- Subject to the HKMA's prior approval, Bank A may use the **BA**[17] for capital calculation during the transition period from 2007 to 2009.
- Although Bank A is capable of using the IRB Approach on retail exposures, it should use the **BA** to calculate the respective capital requirements.

2008

- Subject to the HKMA's prior approval, Bank A may start to use the IRB Approach for capital calculation because its IRB coverage is above the 75% threshold.
- Bank A may continue to use the **BA** to calculate capital requirements for non-exempt exposures (e.g. bank), provided that these exposures will be migrated to the IRB Approach during 2009.

[17] Instead of using the **BA**, Bank A may choose to use the default option, the **SA**, for capital calculation before it is ready to move to the IRB Approach. Use of the default option does not require the HKMA's prior approval. In case the **SA** is used, the following will apply:

- Although Bank A is capable of using the IRB Approach on retail exposures in 2007, it should use the **SA** to calculate the respective capital requirements.
- In 2008, Bank A can continue to use the **SA** to calculate capital requirements for its bank, sovereign and equity exposures. However, exposures which are not exempted by the HKMA from the IRB Approach (i.e. bank) should be migrated to the IRB Approach before the end of 2009.

- Bank A may continue to use the **BA** to calculate capital requirements for IRB-exempt exposures (e.g. sovereign and equity), provided that these exposures will be migrated to the **SA** during 2009.

2009

- Bank A has completed the rollout of the IRB Approach for capital calculation, with its IRB coverage above the 85% threshold.
- Any exposures that are exempted by the HKMA from the application of the IRB Approach (e.g. sovereign and equity) should be migrated to the **SA** for capital calculation before the end of 2009. Other non-exempt exposures that remain on the **BA** should be migrated to the IRB Approach before the end of 2009.

(ii) Bank B: Using a mix of the Basic Approach ("BA") and Standardised Approach ("SA") during the transition period

	2007		2008		2009	
Asset class	**Type of Approach**	**%of credit RWAs**	**Type of Approach**	**%of credit RWAs**	**Type of Approach**	**%of credit RWAs**
Corporate	BA	30%	IRB	27%	IRB	28%
Bank	BA	22%	BA	20%	IRB	18%
Sovereign*	SA	2%	SA	2%	SA	2%
Retail	IRB	45%	IRB	50%	IRB	50%
Equity*	SA	1%	SA	1%	SA	2%
	IRB	45%	IRB	77%	IRB	96%
	Non-IRB	55%	Non-IRB	23%	SA	4%
	Total	100%	Total	100%	Total	100%
	IRB status	**No**	**IRB status**	**Yes**	**IRB status**	**Yes**

**: Asset classes that are exempted by the HKMA from the application of the IRB Approach*

2007

- Bank B is not qualified to use the IRB Approach for capital calculation because its IRB coverage cannot meet the minimum threshold of 75%.
- Subject to the HKMA's prior approval, Bank B may use the **BA** for capital calculation during the transition period from 2007 to 2009.
- Although Bank B is capable of using the IRB Approach on retail exposures, it should use the **BA** to calculate the respective capital requirements. However, it may also choose to apply the **SA** at the outset to those exposures exempted by the HKMA from the IRB Approach, i.e. sovereign and equity exposures which will continue to be subject to the **SA** after the end of 2009.

2008

- Subject to the HKMA's prior approval, Bank B may use the IRB Approach for capital calculation because its IRB coverage is above the 75% threshold.
- Bank B may continue to use the **BA** to calculate capital requirements for non-exempt exposures (e.g. bank), provided that these exposures will be migrated to the IRB Approach during 2009.

2009

- Bank B has completed the rollout of the IRB Approach for capital calculation, with its IRB coverage above the 85% threshold.
- Bank B will continue to use the **SA** for sovereign and equity exposures that are exempted by the HKMA from the IRB Approach after the full adoption of the IRB Approach. Other non-exempt exposures that remain on the **BA** should be migrated to the IRB Approach before the end of 2009.

Annex 2: Illustration of requirements for parallel run

The following table illustrates various scenarios of parallel run for an AI that plans to adopt the IRB Approach within the transition period. The variables are :

(i) the IRB adoption date;

(ii) whether the **Basic Approach** and/or **Standardised Approach** will be used within the transition period; and

(iii) the period in which the **Basic Approach** and/or **Standardised Approach** will be used.

Transitional use of non-IRB Approaches		**Using Basic Approach ("BA")**		**Using Standardised Approach ("SA")**[18]		**Using BA plus SA**
		During Q1 2007 to Q2 2007	**During 2007**	**During 2007**	**During Q1 2007 to Q2 2008**	**During Q1 2007 to Q2 2008**
Target IRB adoption date		**IRB from 1.7.2007**	**IRB from 1.1.2008**	**IRB from 1.1.2008**	**IRB from 1.7.2008**	**IRB from 1.7.2008**
2006	Q1	CA*	CA*	CA*	CA*	CA*
	Q2	CA*	CA*	CA*	CA*	CA*
	Q3	CA* and IRB#	CA*	CA* and SA#	CA* and SA#	CA* and (CA+SA)#[19]
	Q4	CA* and IRB#	CA*	CA* and SA#	CA* and SA#	CA* and (CA+SA)#
2007	Q1	**BA*** and IRB#	**BA*** and IRB#	**SA*** and IRB#	**SA***	**(BA+SA)***
	Q2	**BA*** and IRB#	**BA*** and IRB#	**SA*** and IRB#	**SA***	**(BA+SA)***
	Q3	IRB*	**BA*** and IRB#	**SA*** and IRB#	**SA*** and IRB#	**(BA+SA)*** and (IRB+SA)#
	Q4	IRB*	**BA*** and IRB#	**SA*** and IRB#	**SA*** and IRB#	**(BA+SA)*** and (IRB+SA)#
2008	Q1	IRB*	IRB*	IRB*	**SA*** and IRB#	**(BA+SA)*** and (IRB+SA)#
	Q2	IRB*	IRB*	IRB*	**SA*** and IRB#	**(BA+SA)*** and (IRB+SA)#
	Q3	IRB*	IRB*	IRB*	IRB*	(IRB + SA)*
	Q4	IRB*	IRB*	IRB*	IRB*	(IRB + SA)*

*CA: Current Accord; *: for regulatory capital purposes; #: for parallel calculation purposes*

[18] AIs adopting the **SA** are required to provide parallel calculations of credit risk capital requirements based on the current Accord and the **SA** in 2006 for the reporting dates of 30 September and 31 December.

[19] For AIs choosing to use a combination of **BA** and **SA** for capital calculation during the transition period, the parallel run for the period of Q3 and Q4 of 2006 may be waived, provided that the exposures to be calculated under the **SA** are immaterial and exempted from the IRB Approach.

Annex 3: Calculation of capital floor

Example 1: AIs adopting the IRB Approach within the transition period

Calculation of capital floor

• RWAs (credit risk) under the **Basic Approach**	=	$ 80
• RWAs (market risk) under the **Internal Models Approach**	=	$ 10
• RWAs (operational risk[20]) under the **Basic Indicator Approach**	=	$ 5
• Deductions from Core and Supplementary Capital	=	$ 3
• General provision recognised in Supplementary Capital	=	$ 1
• 1st year adjustment factor	=	95%
(i) [8% x ($ 80 + $10) + $ 3 - $ 1] x 95%	=	$ 8.74

Calculation of total RWAs under the various approaches in use

• RWAs (credit risk) under the **Foundation IRB Approach**	=	$ 50
• RWAs (credit risk – for exempted exposures) under the **Standardised Approach**	=	$ 5
• RWAs (market risk) under the **Internal Models Approach**	=	$ 10
• RWAs (operational risk) under the **Basic Indicator Approach**	=	$ 5
TOTAL RWAs	=	**$ 70**
• Shortfall of provisions (total eligible provisions < total expected loss) under the **Foundation IRB Approach**	=	$ 1
• Other deductions from Core and Supplementary Capital	=	$ 2
• General provision recognised in Supplementary Capital for credit exposures under the **Standardised Approach**	=	$ 0.05
(ii) 8% x ($ 50 + $ 5 + $ 10 + $ 5) + $ 1 + $ 2 - $ 0.05	=	$ 8.55

Calculation of regulatory RWAs

As the floor calculated in (i) is larger than $ 8.55 in (ii), an amount equivalent to $ 2.375 (i.e. 12.5 x ($ 8.74 - $ 8.55)) should be added to total RWAs of $ 70. Therefore, the amount of regulatory RWAs under the revised capital adequacy regime for calculation of the capital adequacy ratio should be $ 72.375.

[20] For the purpose of calculating the capital floor within the transition period, RWAs for operational risk are excluded from the calculation.

Example 2: AIs adopting the IRB Approach <u>after</u> the transition period

<u>Calculation of capital floor</u>

- RWAs (credit risk) under the **Standardised Approach** = $ 85
- RWAs (market risk) under the **Internal Models Approach** = $ 25
- RWAs (operational risk) under the **Standardised Approach** = $ 10
- Deductions from Core and Supplementary Capital = $ 3
- General provision recognised in Supplementary Capital = $ 1
- 1st year adjustment factor = 90%

(i) [8% x ($ 85 + $ 25 + $ 10) + $ 3 - $ 1] x 90% = $ 10.44

<u>Calculation of total RWAs under the various approaches in use</u>

- RWAs (credit risk) under the **Foundation IRB Approach** = $ 65
- RWAs (credit risk – for exempted exposures) under the **Standardised Approach** = $ 5
- RWAs (market risk) under the **Internal Models Approach** = $ 25
- RWAs (operational risk) under the **Standardised Approach** = <u>$ 10</u>

  TOTAL RWAs = **$ 105**
- Surplus of provisions (total eligible provisions > total expected loss) recognised in Supplementary Capital under the **Foundation IRB Approach** = $ 0.35
- Deductions from Core and Supplementary Capital = $ 2
- General provision recognised in Supplementary Capital for credit exposures under the **Standardised Approach** = $ 0.05

(ii) 8% x ($ 65 + $ 5 + $ 25 + $ 10) - $ 0.35 + $ 2 - $ 0.05 = $ 10

<u>Calculation of regulatory RWAs</u>

As the floor calculated in (i) is larger than $ 10 in (ii), an amount equivalent to $ 5.5, i.e. 12.5 x ($ 10.44 - $ 10), should be added to total RWAs of $ 105. Therefore, the amount of regulatory RWAs under the revised capital adequacy regime for calculation of the capital adequacy ratio should be <u>$ 110.5</u>.

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WEIGHTING FRAMEWORK FOR OPERATIONAL RISK

Hong Kong Monetary Authority
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WEIGHTING FRAMEWORK FOR OPERATIONAL RISK

Contents

1. Introduction

1.1 Scope and application

1.1.1 This paper sets out the framework for measuring the capital requirement for operational risk of a locally incorporated authorized institution (AI). It describes the framework in terms of the availability and choice of measurement approaches; the qualifying criteria for adoption of the more advanced approaches; and the measurement methodologies under each of the available approaches.

1.1.2 Three approaches are being made available by the HKMA for measuring capital charge for operational risk[1], namely:

- the Basic Indicator Approach (BIA);
- the Standardised Approach (STA); and
- the Alternative Standardised Approach (ASA).

1.1.3 A locally incorporated AI is expected to use the BIA unless it has the prior approval of the HKMA to adopt a more advanced approach (i.e. either the STA or the ASA).

1.1.4 AIs proposing to use the STA or ASA must satisfy the HKMA that they meet the minimum qualifying criteria set out in section 2 below. In considering AIs' applications to use these more advanced approaches, the HKMA will also have regard to the applicant AIs' compliance with the SPM module on Operational Risk Management [which is being developed]. The SPM module is modelled on the paper "Sound Practices for the Management and Supervision of Operational Risk" issued by the Basel Committee in 2003, aiming to provide additional, detailed guidance on operational risk management systems.

1.1.5 The risk-weighted exposure for operational risk of an AI, calculated according to the framework set out in this paper, will be summed together with the risk-weighted exposures for credit and market risk to yield the total risk-weighted exposures which will then be used to calculate the capital adequacy ratio (CAR).

2. Qualifying criteria for the Standardised Approach and Alternative Standardised Approach

2.1 Qualifying criteria

[1] The HKMA does not plan to make available at present the "Advanced Measurement Approaches" (AMA) referred to in the Basel Committee's framework.

2.1.1 Subject to meeting the minimum qualifying requirements, AIs may seek the HKMA's approval to use either the STA or ASA.

2.1.2 To use the STA or ASA, which are more advanced approaches to measuring the capital charge for operational risk, an AI must have in place adequate internal operational risk management systems that are commensurate with the nature, volume and complexity of its business activities. In particular, it should meet the following criteria:

- its board of directors and the senior management, as appropriate, are actively involved in the management of operational risk and are actively overseeing the whole risk management framework;
- it should have an operational risk management function assigned with clear responsibilities and duties which include developing strategies to identify, assess, monitor and control/mitigate operational risk, establishing policies and procedures, designing and implementing operational risk assessment methodology, and designing and implementing a risk-reporting system for operational risk;
- it has a well documented set of internal policies, controls and procedures concerning its operational risk management system, including policies for the treatment of non-compliance issues. There should also be a routine in place for ensuring compliance with the established policies, controls and procedures for the management of operational risk;
- there must be regular reporting of relevant operational risk information to business unit management, senior management, and to the board of directors that supports proactive management of operational risk. The type of information contains in the reports should include self risk assessment results, key risk indicators, material actual or potential operational risk losses, and details of major operational risk events consistent with the scope of definition adopted by the AI. There should also be established procedures for taking appropriate actions according to the information within the management reports;
- it should have an operational risk assessment system which is capable of, among other things, tracking systematically relevant operational risk data such as material losses by different business lines, and which is closely integrated into the risk management processes of the AI;

- it has sufficient resources to cope with the use of the approach in major business lines, control and audit areas; and
- the operational risk management processes and assessment system, including the activities of the business units and of the operational risk management function, must be subject to validation and regular independent reviews by internal or external auditors.

2.1.3 The AI should have specific policies and documented criteria for mapping gross income for current business lines and activities into the standardised framework in accordance with the principles set out in paras. 3.4.7 and 3.4.8 below. It should be able to demonstrate to the satisfaction of the HKMA the reasons behind their mapping.

2.1.4 Without the approval of the HKMA, AIs using the STA or ASA will not be allowed to revert to the BIA and AIs using the ASA will also not be allowed to revert to the STA.

2.1.5 If the HKMA determines that an AI using the STA or ASA no longer meets the qualifying criteria for the approach, it may request the AI to revert to the BIA for some or all of its operation until it meets the conditions specified by the HKMA for returning to the STA or ASA.

3. Measurement methodologies

3.1 Overview

3.1.1 Gross income is used as a broad indicator for the scale of AIs' operational risk exposure. The capital charge is calculated by multiplying gross income by a factor (denoted as alpha or beta). The factor serves as a proxy for the relationship between operational loss and the gross income of an AI. In the BIA gross income is measured on an aggregate basis, whereas in the STA or ASA gross income is measured for each business line, not the whole institution. The detailed measurement methodologies for each of the approaches are discussed below.

3.2 Definition of Gross Income

3.2.1 Gross income is defined as net interest income plus net non-interest income, gross of operating expenses (including fees paid for outsourcing services) and before any provisions. Specifically, it should:

- Include net interest income, gains less losses arising from foreign exchange operations and trading in derivatives, income from securities investment held for trading (i.e. securities carried at fair value through profit

or loss under HKAS 39), dividend from subsidiary and associated companies and other equity investments, income from fees and commissions (including fees received for insourcing service), and other income arising from ordinary activities of the AI, but

- exclude realised profits/losses from the sale of non-trading investments (i.e. securities classified as "held to maturity" or "available for sale" under HKAS 39), profit/loss arising from extraordinary or irregular items (e.g. profit from sale of fixed assets and income derived from insurance claims).

3.3 Basic Indicator Approach

3.3.1 The capital charge for operational risk of an AI under the BIA should be derived as a fixed percentage (denoted alpha) of the AI's annual gross income over the previous three years[2]. Figures for any year in which the annual gross income is negative or zero should be excluded from both the numerator and denominator when calculating the average gross income. The charge can be expressed as:

$K_{BIA} = [\sum(GI_{1...n} \times \alpha] / n$

Where

K_{BIA} = the capital charge under the BIA

GI = annual gross income, where positive, over the previous three years

n = number of the previous three years for which annual gross income is positive

$\alpha = 15\%$

3.3.2 The capital charge under BIA should then be converted into a risk-weighted exposure equivalent so that it can be added to the total credit and market risk-weighted exposures of the AI for calculating its CAR. The operational risk-weighted exposure is equal to the capital charge under BIA multiplied by 12.5[3].

3.3.3 If the AI has been in operation for less than 3 years, the denominator (i.e. n) in the above formula would be changed to the nearest number of full years that it has been in operation i.e. any period of 6 months or more will

[2] An AI's gross annual income, for the purposes of this paper, is calculated as the sum of the gross income for the last four quarters. For example, in calculating end-May 2007 position, the gross annual income for the last year means the gross income generated by the AI in the previous four quarters of operation, i.e. Q1 2007 and Q2, Q3 and Q4 2006. In other words, the annual gross income for the previous year for the positions as of April 2007 and March 2007 is the same as that of May 2007. The same principle applies to the calculation of annual gross income for the two years preceding the last year.

[3] This is the reciprocal of the Basel minimum CAR of 8%.

be counted as a full year. However, if the AI has been in operation for less than 1 year, it will be considered as a special case and the operational risk capital charge will be calculated using a method separately agreed with the HKMA (see para. 3.6.1 below). The number of years that should be used in the above formula for calculating the capital charge is as follows:

Years in operation	Denominator
$\geq$ 1.0 year $<$ 1.5 years	1
$\geq$ 1.5 years but $<$ 2.5 years	2
$\geq$ 2.5 years but $<$ 3 years	3

3.3.4 If a partial year in operation has been rounded-up to a year, the gross income for that year should be annualised to arrive at the annual gross income for inputting into the numerator of the above formula[4]. If a partial year has been rounded-down, the gross income of that year will be considered to be zero.

3.3.5 If the annualised gross income of a partial year is negative, it will be subject to the same treatment as stated in para. 3.3.1 above.

3.4 Standardised Approach

3.4.1 Under the STA, an AI's activities are divided into eight business lines, namely: corporate finance; trading and sales; retail banking; commercial banking; payment and settlement; agency services; asset management; and retail brokerage. The business lines are defined in Annex A and an example of allocating the gross income to different business lines is shown at Annex B.

3.4.2 The capital charge for the operational risk of each business line is calculated by multiplying gross income (as defined under subsection 3.2) by the factor (denoted beta) assigned to that business line.

3.4.3 The total capital charge is then calculated as the three-year average (see footnote 2 for the definition of calculation) of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines. However, where the aggregate capital charge across all business

[4] For example, if the AI has only been in operation for 2 years and 7 months (say from February 2005 to August 2007), the annual gross income of the partial year is taken to mean the gross income of the AI for the period of February to August 2007 "annualised" (i.e. grossed up by 12/7).

lines within a given year is negative, the input to the numerator for that year in calculating the average capital charge will be zero. The total capital charge can be expressed as:

$K_{STA} = \{\sum_{years1-3} \max [\sum(GI_{1-8} X \beta_{1-8}), 0]\} / 3$

Where

K_{STA} = the capital charge under the STA

GI_{1-8} = annual gross income (as defined under BIA) for each of the eight business lines

β_{1-8} = a fixed percentage assigned to each of the eight business lines, as follows:

Business lines	Beta Factors
Corporate finance	18%
Trading and sales	18%
Retail banking	12%
Commercial banking	15%
Payment and settlement	18%
Agency services	15%
Asset management	12%
Retail brokerage	12%

3.4.4 The capital charge under the STA should then be converted into a risk-weighted exposure equivalent so that it can be added to the total credit and market risk-weighted exposures of the AI for calculating its CAR. The operational risk-weighted exposure is equal to the capital charge under STA multiplied by 12.5.

3.4.5 If the AI has been in operation for less than 3 years, the denominator (i.e. 3) and numerator in the above formula will be adjusted in accordance with the method stated in paras. 3.3.3 and 3.3.4 above.

3.4.6 If the annualised gross income of a partial year is negative, it will be subject to the same treatment as stated in para. 3.4.3 above.

Mapping principles

3.4.7 AIs must develop specific policies for mapping gross income of current business lines and activities into the STA framework. These policies must be reviewed and adjusted for new or changing business activities regularly.

3.4.8 The approach used by an AI to map its activities into the eight business lines must meet the following principles:

- all business activities of an AI must be mapped into the eight business lines in a mutually exclusive and jointly exhaustive manner;
- any activity which cannot be readily mapped into the business line framework, but which represents an ancillary function to an activity included in the framework, must be allocated to the business line it supports. If more than one business line is supported through the ancillary activity, an objective mapping criteria must be used (e.g. proportional allocation according to the time spent or sole allocation to the business line on which most time is spent);
- when mapping gross income, if an activity cannot be mapped into a particular business line, then the business line yielding the highest charge must be used (i.e. 18%). Any associated ancillary activities will follow the same business line treatment;
- AIs may use internal pricing methods to allocate gross income between business lines, provided that the total gross income of an AI equals the sum of gross income of the eight business lines;
- the mapping activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations in other risk categories, e.g. credit and market risk. Any deviations must be clearly explained and documented;
- the mapping process used must be clearly documented and be detailed enough for third parties to replicate the business line mapping. Any exceptions or overrides must be properly documented;
- processes to define the mapping of any new activities or products should be in place;
- senior management should be responsible for the mapping policy, which should be properly approved by the board of directors; and
- the mapping process must be subject to regular independent review (e.g. by independent operational risk management function, internal auditors or external auditors).

3.5 Alternative Standardised Approach

3.5.1 Under the ASA, the operational risk capital charge/methodology is the same as the STA except for two business lines - retail banking and commercial banking. For

these business lines, loans and advances – multiplied by a fixed factor 'm'- replaces gross income as the exposure indicator. The betas for retail and commercial banking are unchanged from the STA.

3.5.2 For the purposes of the ASA, total loans and advances in the retail banking business line consists of the total drawn amounts in the following credit portfolios: retail, small and medium-sized entities (SMEs) treated as retail, and purchased retail receivables.

3.5.3 For commercial banking, total loans and advances consists of the drawn amounts in the following credit portfolios: corporate, sovereign, bank, specialised lending, SMEs treated as corporate, purchased corporate receivables; and book value of securities held in the banking book.

3.5.4 **An AI can choose to use the ASA providing it can satisfy the HKMA that this approach provides an improved basis for measuring the operational risk**. This means that the adoption of ASA is subject to the HKMA's prior approval. This approach may be adopted by AIs that concentrate in retail and commercial banking activities, where significant portions of their loans arising from such activities are of high profit margin and high probability of default. Due to the nature of these loans, it is likely that they have already carried high credit risk-weighted exposures. As a result, the ASA, which uses loans and advances instead of gross income as the proxy indicator to calculate operational risk-weighted exposures, will reduce double counting of risks. It is not envisaged that large AIs with diversified businesses would use this approach.

3.5.5 The ASA operational risk capital charge for retail banking (the same formula for commercial banking) can be expressed as:

$K_{RB} = \beta_{RB} \times m \times LA_{RB}$

Where

K_{RB} = the capital charge for retail banking business

β_{RB} = beta for retail banking business line

m is 0.035

LA_{RB} = quarterly outstanding retail loans and advances, averaged over the previous three years (see footnote 2)

3.5.6 For the remaining six business lines, the capital charges will be calculated in the same way as under the STA. However, if the aggregate capital charges of these six business lines within a given year is negative, it will be

treated as zero and will not be allowed to offset the capital charge for retail and commercial banking businesses (which will always be positive).

3.5.7 Under the ASA, AIs may aggregate retail and commercial banking using a beta of 15%. Similarly, those AIs that are unable to disaggregate their gross income into the other six business lines can aggregate the total gross income for these six business lines using a beta of 18%, with the negative gross income treated as described in para. 3.4.3 above.

3.6 Special cases treatment

3.6.1 In certain circumstances, the HKMA may consider that the measurement methodologies specified in this paper cannot accurately reflect an AI's exposure. Such circumstances may include AIs with negative gross income for the previous three years, in operation for less than 1 year, or undergoing merger, acquisition or material restructuring, which render using the gross income of the previous three years as a measure of the AI's operational risk exposure inappropriate. In such cases, the MA will discuss with the AI concerned an alternative method for calculating the operational risk capital charge. For example, a newly established AI may be required to use the projected gross income in its 3-year business plan attached to the application for authorisation to calculate its operational risk capital charge. Alternatively, the HKMA may capture the operational risk of these AIs in setting their minimum CARs under Pillar 2.

Annex A: Detailed definition of each business line

Business lines under the STA framework	Major business segments	Activity Groups
Corporate Finance	Corporate Finance	Mergers and Acquisitions, Underwriting, Privatisations, Securitisation, Research, Debt (Government, High Yield), Equity, Syndications, IPO, Secondary Private Placements
	Municipal/Government Finance	
	Merchant Banking	
	Advisory Services	
Trading & Sales	Sales	Fixed income, equity, foreign exchanges, commodities, credit, funding, own position securities, lending and repos, brokerage, debt, prime brokerage
	Market Making	
	Proprietary Positions	
	Treasury	
Retail Banking	Retail Banking	Retail lending and deposits, banking services, trust and estates
	Private Banking	Private lending and deposits, banking services, trust and estates, investment advice
	Card Services	Merchant/Commercial/Corporate cards, private labels and retail
Commercial Banking	Commercial Banking	Project finance, real estate, export finance, trade finance, factoring, leasing, lends, guarantees, bills of exchange
Payment and Settlement[5]	External Clients	Payments and collections, fund transfer, clearing and settlement
Agency Services	Custody	Escrow, Depository Receipts, Securities lending (Customers), Corporate actions
	Corporate Agency	Issuer and paying agents
	Corporate Trust	
Asset Management	Discretionary Fund Management	Polled, segregated, retail, institutional, closed, open, private equity
	Non-Discretionary Fund Management	Pooled, segregated, retail, institution, closed, open
Retail Brokerage	Retail Brokerage	Execution and full service

[5] Payment and settlement losses related to an AI's own activities would be incorporated in the loss experience of the affected business lines.

Annex B: An example of allocating gross income to business lines

Business lines	Gross income
Retail Banking	• net interest income[6] on loans and advances to retail customers and SMEs treated as retail • fees related to traditional retail activities • net income from swaps and derivatives held to hedge the retail banking book • income on purchased retail receivable
Commercial Banking	• net interest income[6] on loans and advances to corporate and SMEs treated as corporate, interbank and sovereign customers • income on purchased corporate receivable • fees related to traditional commercial banking activities including commitments, guarantees, bills of exchange, • net income on securities held in the banking book • profits/losses on swaps and derivatives held to hedge the commercial banking book
Trading and Sales	• profits/losses on instruments held for trading purposes, net of funding cost, • fees from wholesale broking
Payment and Settlement / Agency Services / Brokerage	• net fees/commissions earned • fees to cover provision of payments/settlement facilities for wholesale counterparties
Corporate Finance / Agency Services / Asset Management / Retail Brokerage	• net fees/commissions earned in each business

[6] Interest earned on loans and advances less the weighted average cost of funding of loans (from any sources).