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RESERVE BANK OF INDIA
www.rbi.org.in

RBI/2011-12/311
DBOD.No.BP.BC.67/21.06.202/2011-12

December 22, 2011

The Chairmen and Managing Directors /
Chief Executive Officers of All Commercial Banks
(excluding Regional Rural Banks and Local Area Banks)

Dear Sir/Madam,

Implementation of the Internal Rating Based (IRB) Approaches for Calculation of Capital Charge for Credit Risk

Please refer to our circular DBOD.No.BP.BC.23/21.06.001/2009-10 dated July 7, 2009, inter alia, advising banks that they can apply for migrating to Internal Rating Based Approach (IRB) for calculation of capital charge for Credit Risk from April 1, 2012 onwards.

2. The draft guidelines for computing credit risk capital charge under IRB were accordingly issued on August 10, 2011 to seek comments and suggestions from all the stakeholders. Based on the comments/suggestions received on the draft guidelines, the final guidelines on IRB as prepared are attached in Annex.

3. Banks intending to move to any of the IRB approaches for computing capital charge for credit risk are advised to assess their preparedness for the same with reference to these guidelines. If a bank feels that it is prepared to adopt IRB approaches as per these guidelines, it may submit a letter of intention and its Board's approval for adoption of IRB approach for credit risk to RBI (Chief General Manager-in-Charge, Reserve Bank of India, Department of Banking Operations and

Department of Banking Operations and Development, Central Office, 12th Floor, Central Office Building, Shahid Bhagat Singh Marg,, Mumbai,400001
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Development, Central Office, 12th Floor, Shahid Bhagat Singh Road, Mumbai – 400001), along with a gist of self assessment report between April 1, 2012 and June 30, 2012. RBI will make initial assessment of the bank's preparedness based on these documents and if satisfied, RBI will allow the bank to give detailed application for moving to IRB approaches as mentioned in Section G of the guidelines. Bank's application will then be followed up with a detailed scrutiny by the RBI and depending on the result of the scrutiny and parallel run; RBI may consider giving final approval to the bank for moving to IRB approaches.

4. It may also be mentioned here that to get the final approval from RBI, the banks will not only have to ensure that they comply with these guidelines but there will also be continuous endeavour from them to improve their credit risk management processes and systems.

Yours faithfully,

(Deepak Singhal)
Chief General Manager-in-Charge

Encl - As above

Annex

CONTENTS

Capital Adequacy - The Internal Ratings Based (IRB) Approach to Calculate Capital Requirement for Credit Risk

Introduction

1. The Basel II framework provides two broad methodologies to banks to calculate capital requirements for credit risk, namely, Standardised Approach (SA) and Internal Rating Based (IRB) Approach. The IRB approach is again classified into Foundation IRB (FIRB) approach and Advanced IRB (AIRB) approach.

2. The Standardised Approach measures credit risk based on external credit assessments, guidelines for which had already been issued by Reserve Bank of India (RBI) vide its circular DBOD. No. BP. BC. 90 / 20.06.001/ 2006-07 dated April 27, 2007, and updated from time to time.

3. The IRB Approach allows banks, subject to the approval of RBI, to use their own internal estimates for some or all of the credit risk components [Probability of Default (PD), Loss Given Default (LGD), Exposure at Default (EAD) and Effective Maturity (M)] in determining the capital requirement for a given credit exposure. This guideline is meant for the banks which are willing and allowed by the RBI to adopt more sophisticated IRB approach. RBI will allow banks to adopt IRB approach if, inter alia, banks meet the requirements mentioned in Appendix 1 of this guideline and obtain RBI's approval for the same.

4. IRB approach to capital calculation for credit risk is based upon measures of unexpected losses (UL) and expected losses (EL). The risk components and risk-weight functions (equations by which risk components are transformed into capital requirements and risk weighted assets) detailed in this guideline help to calculate capital requirements for the UL portion[1]. For EL, the bank must compare the sufficiency of eligible provisions against EL (generally for corporate, sovereign, bank and retail exposures) amounts and adjust the regulatory capital accordingly (as given in para 200).

[1] For a non-technical explanation of Basel II IRB Risk weight functions, please see BCBS Paper entitled "An Explanatory Note on the Basel II IRB Risk Weight Functions" October 2004

5. Under IRB approach, the risk-weighted asset amounts that are derived from the IRB risk-weight functions must be multiplied by a factor of 1.06. The bank must sum the risk-weighted amounts for UL for all IRB asset classes to determine the total risk-weighted asset amount under any of the IRB approaches.

Key terminologies used in this guideline

6. The following terminologies are used in this guideline:

- Probability of Default (PD) - Probability that the borrower will default within one year horizon.

- Loss Given Default (LGD) - Bank's economic loss upon the default of a debtor/borrower.

- Exposures at Default (EAD) - Gross exposure/potential gross exposure under a facility (i.e. the amount that is legally owed to the bank) at the time of default by a borrower.

- Effective Maturity (M) - Effective maturity of the underlying should be gauged as the longest possible remaining time before the borrower is scheduled to fulfil its obligation.

- Purchased Receivables – A pool of receivables purchased by the bank from another entity. Among others, this may also include those exposures when a bank is buying loans from other banks.

- Dilution Risk - This arises out of the possibility of reduction in the amount of total purchased receivables through cash or non cash credits to receivables' obligors. Suppose an entity has supplied some goods to a buyer on credit basis, recorded the future payments due as receivables, and subsequently sells the receivables to a bank. In this scenario, if the bank buying the receivables sees the possibility that because of the agreement between seller of the receivables and the buyer of the goods (like on account of return of goods sold, dispute regarding product quality, promotional discount offered by the supplier etc.), there is a chance of material decrease in the amount of the receivables after purchasing the same, it has to account for dilution risk.

- Eligible Guarantor - Specific entities which can provide guarantee on behalf of the borrower, by virtue of which the lender may have a direct claim on those entities and these guarantees given should be referenced to a specific exposure or a pool of exposures.

7. The remaining part of the guidelines are divided into seven sections along with eleven Appendices at the end. Section A talks about the categorisation of exposures, issues related to adoption of IRB approaches in the banks and the transitional floors that the banks need to follow once they receive the approval for using IRB approaches. Section B talks about the treatments of corporate, sovereign and banks exposures. Section C and D talk about the treatment of retail and equity exposures respectively. Section E deals with the securitisation exposures in the banking book and section F touches upon supervisory review process under Pillar 2. Finally, section G describes the application process that the banks need to follow to get approval for adoption of IRB approaches.

Section A

Categorisation of Exposures

8. Under the IRB approach, to arrive at the risk weighted assets (RWA) for exposures, banks may categorise banking-book exposures into broad asset classes with different underlying risk characteristics, subject to the definitions elaborated subsequently. There are broadly six asset classes. They are:

i. Corporate,
ii. Sovereign,
iii. Bank,
iv. Retail,
v. Equity, and
vi. Others

It is the responsibility of banks to convince RBI that the categorisation of exposures in different asset classes is appropriate and consistent over time given their business practices.

Corporate Exposure

9. A corporate exposure is defined as a debt owed by a company, partnership or proprietorship to a bank. Claims on Indian Public Sector Undertakings (PSUs), foreign Public Sector Entities (PSEs), and Primary Dealers (PDs) will be treated as claims on corporate. Trusts and societies which have features like the corporate and function like corporate will fall under this asset class.

Specialised Lending Sub- Classes

10. The corporate asset class includes, but is not limited to, four separate sub-classes of specialised lending (SL). The four sub-classes of specialised lending are project finance (PF), object finance (OF), commodities finance (CF) and income-producing real estate (IPRE). Each of these sub-classes is defined in the Appendix 2. Also, such lending should possess the following characteristics, either in legal form or economic substance:

- The exposure is typically to an entity [often a special purpose vehicle (SPV) also known as 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; and

- The lender has a substantial degree of control over the asset(s) and the income that it generates from the use of the assets.

Sovereign Exposure

11. The sovereign exposure covers all credit exposures to counterparties as mentioned below:

- Fund and non-fund based claims on the Central Government along with Central Government guaranteed claims,

- Claims on the Reserve Bank of India (RBI), DICGC and Credit Guarantee Fund Trust for Small Industries (CGFTSI),

- Direct loan/credit/overdraft exposure to the State Governments, investment in State Government securities and State Government guaranteed claims, and

- Claims on foreign sovereigns and their central banks.

12. In the absence of sufficient data points, if banks find it difficult to apply IRB approaches to the exposures mentioned above, they may be treated as per Standardised Approach with the prior approval of RBI. The IRB applicant banks may, however, make an endeavour to apply IRB approaches to these exposures at the earliest.

Bank Exposure

13. The bank exposure includes claims on:

- Banks incorporated in India, branches of foreign banks operating in India as well as branches of foreign banks in foreign countries. This will also include exposure to ECGC,

- Bank for International Settlements (BIS) and the International Monetary Fund (IMF), and

- Claims on Multilateral Development Banks (MDBs) as given below:

    1. World Bank Group: IBRD and IFC
    2. Asian Development Bank
    3. African Development Bank
    4. European Bank for Reconstruction and Development
    5. Inter-American Development Bank
    6. European Investment Bank
    7. European Investment Fund
    8. Nordic Investment Bank
    9. Caribbean Development Bank
    10. Islamic Development Bank
    11. Council of Europe Development Bank
    12. International Finance Facility for Immunization

14. In the absence of sufficient data points, if banks find it difficult to apply IRB approaches to the exposures to ECGC, BIS, IMF and other MDBs, they may be treated as per Standardised Approach with the prior approval of RBI. The IRB applicant banks may, however, make an endeavour to apply IRB approaches to these exposures at the earliest.

Retail Exposure

15. An exposure is categorised as a retail exposure if it is extended to an individual (i.e. a natural person) or individuals and is part of a large pool of exposures that is managed by the bank on a pooled basis, e.g. credit cards, overdrafts, retail facilities secured by financial instruments, residential mortgage loans, etc. Loans extended to small businesses (not necessarily to an individual) and managed as retail exposures by the bank in its internal risk management systems consistently, may be treated as retail exposures, provided that the conditions mentioned in para 132 are fulfilled. Within the retail asset class category, banks are required to identify three separate sub-classes of exposures, namely, exposures secured by residential properties, qualifying revolving retail exposures and other retail exposures.

Equity Exposure

16. Equity exposures include both direct and indirect (say holding of derivative instruments tied to equity, holdings in those institutions that issue ownership interests) ownership interest, whether voting or non-voting, in the assets and income of a commercial enterprise or of a financial institution. Equity exposures are defined on the basis of the economic substance of the instrument and required to meet all the following requirements:

- It is irredeemable i.e., 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 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.

Others

17. This category may include fixed assets, fund and non-fund based claims on venture capital funds, loans and advances to bank's own staff which are fully covered by superannuation benefits and/or mortgage and any other exposures which the bank is not able to categorise under the five asset classes viz. corporate, sovereign, banks, retail and equity, as detailed above. Banks need to take approval from RBI for categorising the exposures under this category. Banks may apply risk weights to such exposures as per the standardised approach as mentioned in para 189 of this guideline.

Different approaches under IRB

18. For the corporate (except in case of some of the specialised lending sub-classes), sovereign and bank asset classes, there are two IRB approaches to derive the capital requirement for credit risk:

I. Foundation IRB approach (FIRB)
II. Advanced IRB approach (AIRB)

Under the FIRB, banks are generally expected to provide their own estimates of PD and rely on the supervisory estimates for other risk components, namely LGD, EAD

and M while under the AIRB, banks provide their own estimates of PD, LGD and EAD and their own calculation of M. Under both approaches, banks are required to use the relevant IRB risk weighted function, as detailed subsequently in para 114 and 115, for the purpose of deriving the capital requirement for UL for the relevant exposures.

19. In some cases of Specialised Lending (SL) sub-asset classes under Corporate IRB asset class, where banks do not meet PD estimation requirements, specific risk weights associated with slotting categories may be used, as detailed later in para 121 and 122, for calculating regulatory capital for UL for the relevant exposures.

20. For the retail asset class, banks are required to provide their own estimates of PD, LGD and EAD. There is no explicit maturity adjustment and no distinction between FIRB and AIRB for this asset class.

21. Within the corporate and retail asset classes, a separate treatment for purchased receivables may also apply, provided certain conditions are met. For purchased receivables in both the corporate and retail asset classes, banks are required to hold regulatory capital for default risk and wherever material, dilution risk.

22. There are two broad approaches to calculate RWA for equity exposures which are not held in the trading book of the bank: a market based approach and a PD/LGD approach. The PD/LGD approach to equity exposures will be available for those banks that adopt advanced IRB approach for other exposure types (viz. corporate, sovereign, bank and by default retail).

23. Further, it may be added that banks' exposures which are kept under Available for Sale (AFS) category, will be attracting risk weight as per foundation/advanced IRB approach only, even if those banks continue to be under Standardised Measurement Method (SMM) for market risks.

Adoption of IRB Approach

24. Banks, at their discretion, would have the options either to remain on Standardised Approach or of adopting the IRB Approach for credit risk. They may thus undertake an internal assessment of their preparedness for migration to IRB, in the light of the criteria envisaged in this document (Appendix 1) and take a decision on their migration to IRB. Banks are then needed to invariably obtain prior approval of RBI for adopting IRB Approach. If, however, RBI examines and finds that the bank applying to adopt IRB approach does not meet required criteria, it may reject the application. Further, in the instance when a bank is given initial approval but in subsequent periods it is found that it no longer meets the requirements for IRB approach, RBI may require the bank to revert to a simpler approach for some or all of its operations, until it meets the conditions specified by RBI for adopting/returning to the more advanced approach.

25. Once a bank adopts IRB approach, it is expected to extend it across all material asset classes within the bank and the entire banking group. However, for some banks, if it is not be practicable for various reasons to implement the IRB approach at the same time, RBI may permit banks to adopt a phased roll out of the IRB approach.

26. An overriding consideration for allowing partial use is that banks must submit an acceptable rationale for any requested carve outs and the rationale should not be based on minimising regulatory capital charge. Further, the applicant bank must produce an implementation plan, specifying to what extent and when it intends to roll out IRB approaches across all material asset classes within the bank, and different entities in the same group over time. The plan should be exacting, yet realistic, and must be agreed with the RBI. The roll out period should not be long, preferably not more than 24 months.

27. During the roll out period, no capital relief is granted for intra-group transactions which are designed to reduce the banking groups' aggregate capital charge by transferring credit risk among entities on the standardised/foundation IRB/advanced IRB approaches. This will include but not limited to asset sales or cross guarantees.

28. Some exposures that are immaterial in terms of size and perceived risk profile may be exempted from the requirements specified in paragraphs 25 and 26, subject to approval from the RBI. Capital requirements for such operations will be determined according to standardised approach. The total exemptions (which includes exposures where phased roll out is allowed or which are immaterial in terms of size and perceived risk profile) should not be more than 15% of the total assets or net revenue (operating profit before provisions), whichever is lower, of the applicant bank. However, the total exemptions may be arrived at after excluding those exposures, for which banks have been given option to use other approaches viz. Slotting criteria approach for Specialised Lending exposures and Standardised Approach treatment for some of other exposures as per this guideline.

29. Once a bank has adopted IRB approach for all or part of any of the corporate, bank, sovereign or retail asset classes, it will be required to adopt IRB approach for its equity exposure at the same time, subject to materiality (say less than 0.5% of the total banking book exposure to be treated as immaterial). RBI, at its discretion, may require a bank to employ one of the IRB equity approaches if its equity exposures are a significant part of bank's business, even though the bank may not employ an IRB approach in other asset classes. Further, banks adopting IRB approaches are expected to continue with IRB approaches. A voluntary return to the standardised from IRB approaches or IRB foundation approach from IRB advanced approach is permitted only in extraordinary circumstances, such as divestiture of a large fraction of the banks' credit related business and must be approved by the RBI.

30. Given the data limitations associated with SL exposures, a bank may remain on the supervisory slotting criteria (given in para 121 and 122) approach and move to the foundation or advanced approach for other sub classes within the corporate asset class.

Transition arrangements

31. As per the time frame specified for implementation of IRB approach in India, the earliest date of making application by banks to RBI is April 1, 2012 and likely date of

approval by RBI is March 31, 2014. RBI expects that 18 months of parallel run and detailed analysis of the adequacy of applicant bank's rating system, governance and operational integrity, data management, use and experience may be carried out before the final approval is given to a bank.

32. The transition period starts on the date of implementation of this framework by the bank and will continue for minimum of two years from that date. Banks adopting IRB Approach are required to calculate minimum capital requirement using IRB Approach as well as the Standardised Approach of Basel II. During the transition period, the minimum capital maintained by banks for implementation of IRB Approach will be subjected to prudential floor which shall be higher of the minimum capital required to be maintained as per the IRB Approach and a specified percentage of minimum capital required to be maintained as per the Standardised Approach. The specified percentage will progressively decline as indicated below:

Financial year ending	**Year 1**	**Year 2 and onwards**
Prudential floor (Minimum Capital requirement computed as per Standardised Approach of Basel II)	100%	90%

Any change in the prudential floor subsequent to second year of IRB implementation, if any, will be communicated by RBI at that time.

33. At the beginning of the transition period, pertaining to corporate, sovereign, bank and equity exposures, banks need to take note of the following –

- For corporate, sovereign and bank exposures, the bank must demonstrate that it has been using a rating system which was broadly in line with the minimum requirements articulated in this document for at least three years prior to qualification to these approaches.

- The transitional approaches mentioned above will be applicable to PD/LGD approach to equity as well. However, there is no transitional arrangement for market based approach for equity exposure.

34. For a maximum of ten years, RBI may exempt, from the IRB treatment, particular equity investments held by the applicant bank. The exempted position is measured as the number of shares as on that date and any additional shares arising directly as a result of owning those holdings, as long as those do not increase the proportional share of ownership in an investee company.

35. If an acquisition increases the proportional share of ownership in a specific holding (say, due to change of ownership initiated by the investing company subsequent to the date of this circular), the exceeding part of the holding is not subject to exemption. Nor will the exemption apply to holdings that were originally subject to the exemption, but have been sold and then brought back. Equity holdings covered by these transitional provisions will be subject to the capital requirements as per the standardised approach.

Section B

Estimation of Risk components for Corporate, Sovereign and Bank exposures

Probability of Default (PD)

36. PD estimation should always be borrowers specific i.e. all exposures to a single borrower will be assigned a single PD.

37. For corporate and bank exposures, PD is 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. For both FIRB and AIRB, banks should be estimating PDs of the exposures. The PD of the borrowers assigned to a default grade, consistent with default criteria is 100%. The minimum requirements for the derivation of the PD estimates associated with each internal borrower grade are mentioned below:

Requirements for PD estimation for corporate, sovereign and bank exposures

38. Banks must use information and techniques that take appropriate account of the long-run experience when estimating the average PD (i.e. long term average PD) for each rating grade. For example, banks may use one or more of the three specific techniques: internal default experience, mapping to external data, and statistical default models.

39. The minimum requirements for the three specified techniques are:

(i) Banks may use data on internal default experience for the estimation of PD. A bank must demonstrate in its analysis that the estimates are reflective of underwriting standards and of any differences in the rating system that generated the data and the current rating system. Where only limited data are available, or where underwriting standards or rating systems have changed, the bank must add a greater margin of conservatism in its estimate of PD. The use of pooled data across institutions may also be recognised. A bank must demonstrate that the internal rating systems and criteria of other banks in the pool are comparable with its own.

(ii) Banks may associate or map their internal grades to the scale used by an external credit rating agency and then attribute the default rate observed for the external credit rating agency's grades to the bank's grades. Mappings may be based on a comparison of internal rating criteria (including risk drivers) to the criteria used by the external rating agency and on a comparison of the internal and external ratings of any common borrowers. Biases or inconsistencies in the mapping approach or underlying data must be avoided. The external agency's criteria underlying the data used for quantification must be oriented to the risk of the borrower and not reflect transaction characteristics. The bank's analysis must also include a comparison of the default definitions used.

(iii) A bank is allowed to use a simple average of PD estimates for individual borrowers in a given grade, where such estimates are drawn from statistical default prediction models. The bank's use of PD models along with other models used for capital calculation purpose must meet the standards specified in para 28-40 of Appendix 1.

40. Irrespective of whether a bank is using external, internal, or pooled data sources, or a combination of the three, for its PD estimation, the length of the underlying historical observation period used must be the long one (preferably to cover the entire economic cycle) for each rating grade, and minimum of five years for at least one of these three sources. If the available observation period spans a longer period for any source, and this data are relevant and material, this longer period must be used.

41. Banks may have a primary technique for PD computation and use others as a point of comparison and potential adjustment. The mechanical application of a technique without supporting analysis is not sufficient. Banks must recognise the importance of judgmental considerations in combining results of techniques and in making adjustments for limitations of techniques and information.

Loss Given Default (LGD)

42. The LGD attached to any particular exposure is maximum of downturn LGD or long run default weighted average LGD associated with that exposure, should a default occur. LGD is usually shown as the percentage of EAD that the bank might lose in case the borrower defaults. It depends, among others, on the type and amount of collateral as well as the type of borrower and the expected proceeds from the work out (e.g. sales proceeds from sales of collaterals/securities) of the assets.

Also, LGD is exposure specific i.e., different exposures to the same borrower may have different LGDs.

43. Loss estimates must be based on economic rather than accounting concepts i.e. material discount effects and material direct and indirect cost associated with collecting an exposure must also be taken into account. Therefore, care should be taken so that banks must not simply measure the loss recorded in accounting books, although they should be able to compare and reconcile accounting and economic losses.

44. The bank's own work out and collection expertise influences their recovery rates and may be reflected in their LGD estimates, but adjustments to estimates for such expertise must be conservative until the bank has sufficient internal empirical evidence of the impact of its expertise.

45. Estimates of LGD for exposures in the corporate, sovereign and bank asset classes must be based on a minimum data observation period that should ideally cover at least one complete cycle but, in any case, must not be shorter than a period of seven years from at least one source. If the available observation period spans a longer period from any source and the data are relevant and material, this longer period must be used. Further, LGD estimates must reflect economic downturn, where necessary, to capture relevant risks.

46. A bank must estimate LGD for each of the corporate, sovereign and bank exposures. There are two approaches by which the banks can calculate LGD of an exposure under the IRB Approach:

a. A foundation approach
b. An advanced approach

LGD under the Foundation IRB Approach

47. Under the foundation approach, banks must use RBI's estimates for the LGD for the corporate, sovereign and bank asset classes (or for a certain exposure within these asset classes), as summarised below in Table 1.

48. In the Table 1, the estimates of minimum LGDs for both unsecured and secured exposures under F-IRB framework have been provided, which will be subject to review by RBI from time to time. LGD prescription for exposures collateralised with eligible financial collateral is discussed in para 56-57.

Table-1

LGD for unsecured and non-recognised collateralised exposures			
Type of exposure	**Minimum LGD (%)**		
Senior Unsecured claim	65		
Subordinated claim	75		
LGD for collateralised exposures – under eligible collaterals			
Type of collateral	**Minimum LGD (%)**	**Threshold level of collateralisation required for partial recognition of collateral for the exposure (C*)**	**Required level of (over) collateralisation for full recognition of collateral for the exposure(C**)**
Eligible financial collateral[@]	-	-	-
Eligible financial receivables	50	0	125
Eligible Commercial Real Estate (CRE)/Residential Real Estate(RRE)	50	30	140
Other physical collateral [£]	60	30	140

@ treatment has been dealt with in detail in para 56 and 57 of the guidance and Appendix 3
£may include industrial properties, land, etc.

LGD with eligible financial receivables, eligible CRE/RRE and other physical collateral (eligible IRB collaterals)

49. When the level of collateralisation is between the levels C* and C**, then the exposure should be divided in two parts. The collateralised portion of the exposure should be allotted the collateral in such a way that the level of collateralisation for that part of the exposure is at C** level and accordingly minimum LGD should be assigned as per the above table. The other part of the exposure will be treated as unsecured as full amount of collateral has already been used up and will be assigned an LGD of 65%.

Example: Suppose the exposure is of Rs. 100 crore and is collateralised with eligible CRE/RRE of the value of Rs. 70 core. In this case, Rs. 50 crore of the exposure will thus be treated as fully collateralised as Rs. 70 crore of the collateral becomes 140% (C**) of that Rs. 50 crore portion of the exposure. This will be assigned an LGD of 50%. The remaining exposure of Rs. 50 crore will be treated as unsecured and should be assigned an LGD of 65%.

On the other hand, if the same exposure were collateralised with eligible CRE/RRE of Rs. 28 crore then LGD applicable on the whole exposure would be 65% as the entire exposure would be treated as unsecured as the collateral is below the threshold level of 30% (C*) of the total exposure of Rs. 100 crore.

On the other extreme, if the eligible CRE/RRE collateral were of Rs. 142 crore then the LGD applicable on the entire exposure would be the minimum applicable i.e. 50%, as the collateral amount is more than 140% of the exposure.

50. While using the LGD figures for its exposures, banks may take into account the effects of different risk mitigating methods/instruments on the exposures to mitigate the credit risks which they are exposed to. For example, exposures may be collateralised in whole or in part by cash or securities, deposits from the same counterparty, guarantee of a third party, etc. as detailed below.

General Principles for credit risk mitigation

51. The general principles applicable to use of credit risk mitigation techniques are as under:

(i) No transaction in which Credit Risk Mitigation (CRM) techniques are used should receive a higher capital requirement than an otherwise identical transaction where such techniques are not used.

(ii) While the use of CRM techniques reduces or transfers credit risk, it simultaneously may increase other risks (residual risks). Residual risks include legal, operational, liquidity, market risk etc. Therefore, it is imperative that banks employ robust procedures and processes to control these risks, including strategy; consideration of the underlying credit; valuation; policies and procedures; systems; control of roll-off risks; and management of concentration risk arising from the bank's use of CRM techniques and its interaction with the bank's overall credit

risk profile. Where these risks are not adequately controlled, the RBI may impose additional capital charges or take other supervisory actions. The disclosure requirements prescribed in Appendix 4 must also be observed to obtain capital relief in respect of any CRM techniques.

(iii) In order for banks to obtain capital relief for any use of CRM techniques, some minimum standards for legal documentation must be met. All documentation used in collateralised transactions, credit derivatives and guarantees must be binding on all parties and legally enforceable in all relevant jurisdictions. Banks must have conducted sufficient legal review, which should be well documented, to verify this. Such verification should have a well founded legal basis for reaching the conclusion about the binding nature and enforceability of the documents. Banks should also undertake such further review as necessary to ensure continuing enforceability.

52. The methods/instruments that are allowed for this risk mitigation purpose in respect of LGD calculation are namely (i) Collaterals, and (ii) Guarantee/Credit derivatives. The treatment of these credit mitigation techniques under the foundation IRB for assigning LGD to an exposure are discussed below.

Collateralised Transaction

53. A collateralised transaction is one in which

(i) banks have a credit exposure and that credit exposure is hedged in whole or in part by collateral posted by a counterparty or by a third party on behalf of the counterparty. Here, "counterparty" is used to denote a party to whom a bank has an on- or off-balance sheet credit exposure, and

(ii) banks have a specific lien on the collateral and the requirements of legal certainty are met.

54. LGD applicable to uncollateralised exposures and exposures collateralised with eligible IRB collaterals have been mentioned in Table 1 of para 48.

55. LGD calculation and relevant issues applicable for exposures collateralised by eligible financial collateral are mentioned in para 56 and 57.

Exposures which are collateralised by eligible financial collaterals

56. Banks applying FIRB approach may be required to adopt Comprehensive Approach to collaterals as in the SA (allows fuller offset of collateral against the exposure by effectively reducing the exposure amount by the value ascribed to the collateral) for the recognition of eligible financial collateral. In addition, it may be mentioned that the legal mechanism by which collateral is pledged or transferred must ensure that the bank has the right to liquidate or take legal possession of it, in a timely manner, in the event of default, insolvency or bankruptcy (or otherwise defined credit events set out in the transaction document) of the counterparty (and where applicable of the custodian holding the collateral). Also, the credit quality of the counterparty and the value of the collateral should not ideally have a material positive correlation. Banks must have clear and robust procedures for the timely liquidation of collateral and ensure that any legal conditions required for declaring the default of the counterparty and liquidation of the collateral are observed and that collaterals are liquidated promptly.

If the collateral is with a custodian then the banks must take steps to ensure that the custodian segregates the collateral from its own assets.

Modalities for collaterals under IRB approach and also the aspects of haircut applicable to eligible financial collaterals are detailed in Appendix 3.

LGD for collateralised (with eligible financial collateral) exposures

57. Following the comprehensive approach, the effective Loss Given Default (LGD*) applicable to the collateralised transaction (with eligible financial collateral) can be expressed as follows:

LGD* = LGD x (E* / E)

Where LGD is that of the senior unsecured exposure before recognition of collateral (65%);

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 discussed in the Appendix 3. This concept is only used to calculate LGD*. Banks must continue to calculate EAD without taking into account the presence of any collateral, unless otherwise specified.

58. Where repo-style transactions are subject to a master netting agreement, a bank may choose not to recognise the netting effects in calculating capital. However, banks that want to recognise the effect of master netting agreements on such transactions for capital purposes must satisfy the criteria under Treatment of repo-style transactions covered under master netting agreements as given subsequently in para 89-93.

Methodology for the treatment of pools of collateral

59. The methodology for determining the effective LGD (LGD*) of a transaction under the foundation approach where banks have taken both financial collateral and other eligible IRB collateral is aligned to the treatment in the standardised approach as per the following guidance:

- In the case where a bank 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 bank must divide the exposure into the portion covered by eligible financial collateral, the portion covered by receivables, the portion covered by CRE/RRE collateral, a portion covered by other collateral, and an unsecured portion, where relevant.

- Where the ratio of the sum of the value of the CRE/RRE and other collateral to the reduced exposure (reduced after recognising the effect of eligible financial collateral and receivable collateral) is below the associate threshold level (i.e. the minimum degree of collateralisation of the exposure) the exposure would receive the appropriate unsecured LGD value of 65%.

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

Treatment of LGD under guarantees and credit derivative

60. Where guarantees are direct, explicit, irrevocable and unconditional, banks may take account of such credit protection in calculating capital requirements. Only guarantees issued by entities with a lower risk weight than the counterparty will lead to

reduced capital charges since the protected portion of the counterparty exposure is assigned the risk weight of the guarantor, whereas the uncovered portion retains the risk weight of the underlying counterparty. However, it is to be noted that credit risk mitigation in the form of guarantee/credit derivative must not result in adjusted risk weight that is less than that of a similar direct exposure to the guarantor or credit protection provider. Detailed operational requirements for guarantees and credit derivatives eligible for being treated as CRM are given in para 87-96 of Appendix 1 and also in Appendix 5.

61. The range of eligible guarantors is the same as under the SA. Eligible guarantors are also discussed in para 4 of Appendix 5.

62. Eligible guarantee and credit derivatives may be treated under Double Default framework. Otherwise, eligible guarantees/credit derivatives from eligible guarantors/credit protection providers may also be recognised under F-IRB as given below:

i. First the exposure is to be divided into two parts – a covered portion with exposure equal to the notional amount of the eligible guarantee/credit protection bought and the uncovered portion equal to total exposure minus the covered portion.

ii. For the covered portion of the exposure, a risk weight is derived by taking the PD appropriate to the guarantor or credit protection provider's borrower grade or some grade between that of the underlying debtor and the guarantor or the credit protection provider if the bank feels that full substitution of the borrower grade with that of the guarantor or credit protection provider may not be appropriate. The capital requirement will be based on the capital calculation formula applicable to the guarantor or credit protection provider. The bank may or may not 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.

iii. The uncovered portion of the exposure is assigned LGD in the same manner as a direct exposure to the underlying borrower.

iv. If the guarantee or credit derivative stipulates for any materiality threshold below which no payment will be made by guarantor/protection provider in the event of credit loss, then this threshold is effectively equivalent to a retained first loss position and must be fully deducted from common equity Tier 1 of the bank availing the guarantee/protection.

v. Similar to the cases where partial coverage exists, in cases where there is a currency mismatch (discussed in para 63) 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 approach follows the treatment outlined in para 6 and 7 in Appendix 5, and depends upon whether the cover is proportional or tranched.

Currency mismatch

63. Where the credit protection (by way of guarantee or credit derivative) is denominated in a currency different from that in which the exposure is denominated i.e. there is a currency mismatch the amount of the exposure deemed to be protected will be reduced by the application of a haircut H_{FX}, i.e.,

$G_A = G \times (1 - H_{FX})$, where:

G_A= Effective amount of credit protection on account of currency mismatch

G = nominal amount of the credit protection

H_{FX} = haircut appropriate for currency mismatch between the credit protection and underlying obligation. The appropriate haircut based on a 10-business day holding period (assuming daily marking to market) will be applied. If a bank uses supervisory haircuts, it will be 8%. The haircuts must be scaled up using the square root of time formula, depending on the frequency of revaluation of the credit protection as described in Appendix 3.

Maturity Mismatch

64. The maturity of the underlying exposure and the maturity of the credit risk mitigant instruments (e.g. collateral, guarantee and credit derivative) should be defined conservatively. The effective maturity of the underlying should be gauged as the longest possible remaining time before the counterparty is scheduled to fulfil its obligation, taking into account any applicable grace period. For risk mitigants, embedded options which may reduce the term of the mitigants should be taken into account so that the shortest possible effective maturity is used. The maturity relevant here is the residual maturity.

65. For the purposes of calculating risk-weighted assets, a maturity mismatch occurs when the residual maturity of credit risk mitigation instruments is less than that of the

underlying exposure. Where there is a maturity mismatch and the CRM instruments have an original maturity of less than one year, the instrument is not recognised for capital calculation purposes. However, in case of loans collateralised by the borrower's own deposits in the bank, even if the tenor of such deposits is less than three months or deposits have maturity mismatch vis-à-vis the tenor of the loan, the provisions of this paragraph regarding de-recognition of collateral would not be attracted provided an explicit consent of the depositor (i.e. the borrower) has been obtained for adjusting the maturity proceeds of such deposits against the outstanding loan or for renewal of such deposits till the full repayment of the underlying loan.

Adjustments for Maturity Mismatches

66. As outlined above, credit risk mitigants with maturity mismatches are only recognised when their original maturities are greater than or equal to one year. As a result, the maturity of risk mitigants against exposures with original maturities of less than one year must be matched to be recognised. Further, collateral with maturity mismatches will no longer be recognised when they have a residual maturity of three months or less (i.e., even if the residual maturity of the CRM instrument is same as that of the exposure barring the cases of bank deposits as mentioned in the previous para).

When there is a maturity mismatch with recognised credit risk mitigants, the following adjustment will be applied to find out the effective value of credit protection:

$$Pa = P \times (t - 0.25) \div (T - 0.25)$$

where:

Pa = value of the credit protection (e.g. collateral amount, guarantee/credit protection amount) adjusted for maturity mismatch

P = credit protection adjusted for any haircuts

t = min (T, residual maturity of the collateral/guarantee/credit protection arrangement) expressed in years

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

LGD under the Advanced IRB Approach

67. RBI may permit banks to use their own internal estimates of LGD for corporate, sovereign and bank exposures. LGD must be measured as the loss given default as a percentage of the EAD. Banks eligible for the IRB approach that are unable to meet the additional minimum requirements as given below must utilise the LGD estimate under foundation IRB approach. It may be noted that in case of foundation IRB approach, LGD estimates have been prescribed by the RBI and collateral value is based on the current realisable value of the collateral. However, in case of advanced IRB approach, LGD estimates computed by the banks should be based on historical recovery rates of the collaterals.

Requirements for all asset classes

68. A bank must estimate an LGD for each facility that aims to reflect economic downturn conditions i.e., downturn LGD, to capture the relevant risks. The examples of some possible economic downturn conditions may be:

- Periods of negative GDP growth and high unemployment rate (for a well diversified portfolio).
- Periods in which observed default rates have been high for a portfolio of exposures that is representative of reporting bank's current portfolio.
- Periods in which common risk drivers (e.g. collateral values) that influence default and recovery rates are expected to be distressed.

This downturn LGD cannot be less than the long-run default-weighted average LGD calculated based on the average economic loss of all observed defaults within the data source for that type of facility.

A care must be taken that default weighted average LGD is different from exposure weighted average LGD.

Example: Suppose in a portfolio of defaulted asset, there were a total number of 100 exposures out of which 75 exposures were of Rs.1000 each and 25 exposures of Rs. 2000 each. Now the bank could recover nothing (i.e., 100% loss) from the first

75 exposures but could recover Rs.1500 each (i.e., 25% loss) from the 25 exposures.

In this case, the default weighted average LGD will be
{(75*100) + (25*25)}/100 = 81.25%, while

the exposure weighted average LGD would be

[{(75*1000) + (25*500)}/{(75*1000) + (25*2000)}] =70%.

69. In its analysis, the bank must consider the extent of any dependence between the risk of the borrower and that of the collateral or collateral provider. Cases where there is a significant degree of dependence must be addressed in a conservative manner. Any currency mismatch between the underlying obligation and the collateral must also be considered and treated conservatively in the bank's assessment of LGD.

70. LGD estimates must be grounded in historical recovery rates and, when applicable, must not solely be based on the collateral's estimated market value. This requirement recognises the potential inability of banks to gain both control of their collateral and liquidate it expeditiously. To the extent that LGD estimates take into account the existence of collateral, banks must establish internal requirements for collateral management, operational procedures, legal certainty and risk management process.

71. Recognising the principle that realised losses can at times systematically exceed expected levels, the LGD assigned to a defaulted asset (downturn LGD) should reflect the possibility that the bank would have to recognise additional, unexpected losses during the recovery period in downturn conditions. For each defaulted asset, the bank must also construct its best estimate of the expected loss on that asset based on existing economic circumstances and facility status. The amount, if any, by which the LGD on a defaulted asset exceeds the bank's best estimate of expected loss on the asset represents the capital requirement for that asset, and should be set by the bank on a risk-sensitive basis in accordance with paragraph 117. Instances where the best estimate of expected loss on a defaulted asset is less than the sum

of specific provisions and partial charge-offs on that asset may attract RBI scrutiny and must be justified by the bank.

Additional requirements for corporate, sovereign, and bank exposures

72. Estimates of LGD must be based on a minimum data observation period that should ideally cover at least one complete economic cycle but must in any case be no shorter than a period of seven years for at least one source. If the available observation period spans a longer period for any source, and the data are relevant, this longer period must be used.

Principles to be followed by the banks while calculating own estimates of LGD

73. While calculating historical LGD and then estimating the probable future LGDs, a bank should observe the following principles:

(i) All factors which may have a probable effect on the cost of holding (e.g. interest forgone) or collection on a defaulted facility should be considered for LGD calculation. Direct and indirect cost associated with the recovery process should be taken into account. Therefore, not only accounting loss but also the economic loss aspects should be looked into by the bank.

The economic loss as mentioned above may be calculated using EAD, loss of principal, interest, fees (if applicable), present value of the subsequent recoveries and present value of the material direct and indirect cost associated with collecting an exposure, discounted at an appropriate discount rate.

The discount rate used to calculate the economic loss should not result in negative or zero LGD. The discount rate may be either cost of equity or average cost of funds or opportunity cost or some other relevant rates, subject to a floor of the contract rate and penalty, if any.

(ii) The cost of recovery, if can distinctly be assigned to certain exposure should facilitate the calculation of LGD for that exposure. But in cases where this is not feasible, then the banks should use averages of recovery costs over the possible related exposures. In these cases, banks should use their judgement and discretions to allocate and average the recovery costs to different exposures.

(iii) If the bank notionally ends the period of recovery for a particular defaulted exposure in its records when most of the recovery has taken place and most of the costs related to that have been incurred then also the bank should take into consideration the likely remaining additional recovery and cost amount for estimating LGD for that exposure.

Issues to be taken care of by the banks to calculate downturn LGD

74. The effect of the economic downturn conditions on the recovery and hence on estimated LGD should be documented properly and followed rigorously by the banks so that no 'cherry picking' is done to tone down the effect of downturn and hence lowering an LGD estimate.

75. The downturn conditions can be assumed to be country specific as well. For a bank having exposures in foreign countries should take into account the economic indicators of those countries to determine whether any of those countries are experiencing economic downturns. If a bank finds that defaulted exposures in some asset class/various asset classes are showing strong correlation (historically) in recovery rates then the bank may group those countries together for the purpose of ascertaining the downturn conditions.

76. The bank may estimate the negative correlation between the occurrence of defaults and recovery rates. The banks may compare with the average 'through the cycle' recovery rates and compare it with 'point in time' recovery rates in appropriate downturn periods. Difference between these two estimates can help the banks find out the impact of downturn on the recovery rates.

77. Banks may also do a statistical analysis of the relationship between observed default and recovery rates over a complete economic cycle.

78. In case of the exposures secured with collaterals, banks may need to see the effect of the change in the value of the collaterals and hence on the recovery under the economic downturn conditions.

79. Banks may also identify risk factors that determine their recovery rates and analyse the relation between those risk factors and default rates under both the normal conditions and downturn conditions. They could calibrate the LGD estimate with these findings.

Treatment of certain repo-style transactions

80. Banks that want to recognise the effects of master netting agreements on repo-style transactions for capital purposes must apply the methodology outlined in para 89

to 93 for determining exposure value after risk mitigation i.e., E* for use as the EAD and not for use in LGD calculation. However if the banks do not want to recognise master netting agreement, then they can use E* for LGD calculation as in para 57 (in foundation IRB). For banks using the advanced approach, own LGD estimates would be applied for the unsecured exposure amount (E*).

Recognition of risk mitigation (guarantees/credit derivatives) in LGD under the advanced IRB approach

81. Banks using the advanced approach for estimating LGDs may reflect the risk mitigating effect of guarantees/credit derivatives through either adjusting PD or LGD estimates in a consistent manner. In doing so, banks must not include the effect of double default in such adjustments. However, the adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider.

82. A bank relying on own-estimates of LGD has the option to adopt the treatment outlined above in para 62, or to make an adjustment to its own LGD estimate of the exposure to reflect the presence of the guarantee or credit derivative. Other requirements for recognition of guarantee and credit derivatives in A-IRB are discussed in para 87-96 in Appendix 1.

Exposure at Default (EAD)

83. Exposure at Default gives an estimate of the amount outstanding (drawn amounts plus likely future drawdown of yet undrawn lines) when the borrower defaults. On and off balance sheet items will get different treatment under Exposure at Default and it needs to be calculated for each exposure individually. But EAD for both the on and off balance sheet items are measured gross of specific provisions or partial write off.

<u>EAD under Foundation IRB</u>

EAD for on balance sheet items

84. EAD estimate of an on balance sheet exposure (i.e. the drawn amount) should not be less than the sum of

(i) The amount by which a bank's regulatory capital would be reduced if the exposure were fully written off

(ii) Any associated specific provisions and partial write offs

85. When the difference between the particular exposure's EAD and the sum of (i) and (ii) is positive, the amount is termed as discount. The calculation of risk weighted assets is independent of any discounts. Under the limited circumstances i.e. in case of defaulted assets, discounts may be included in the measurement of total eligible provisions for the purpose of EL and provision calculation as mentioned in para 196.

86. For calculation of EAD, on balance sheet netting of loans and deposits is permissible subject to the conditions mentioned below. In these cases, assets (loans) will be treated as exposures and liabilities (deposits) will be treated as collaterals. The specific treatment for case of currency or maturity mismatches, in cases of on balance sheet netting will be the same as mentioned in para no 63 and 64.

Calculation of exposure under on balance sheet netting

87. On-balance sheet netting is confined to loans / advances and deposits, where banks have legally enforceable netting arrangements, involving specific lien with proof of documentation. Banks may calculate EAD and capital requirements on the basis of net credit exposures subject to the following conditions:

Where a bank,

a) has a well-founded legal basis for concluding that the netting or offsetting agreement is enforceable in each relevant jurisdiction regardless of whether the counterparty is insolvent or bankrupt;

b) is able at any time to determine the loans / advances and deposits with the same counterparty that are subject to the netting agreement;

c) monitors and controls the relevant exposures on a net basis; and

d) monitors and controls roll over risk.

It may use the net exposure (the value of E* after risk mitigation in the form of on the balance sheet netting) of loans / advances and deposits in accordance with the

formula in equation A in para 15 of Appendix 3. Loans / advances are treated as exposure and deposits as collateral.

88. The haircuts will be zero except when a currency mismatch exists. A ten business day holding period will apply when daily mark to market and daily re-margining is conducted (else equation B or C of para 24 and 25 respectively of Appendix 3 should be used for adjusted parameters).

Treatment of repo-style transactions covered under master netting agreements

89. Currently in India, Securities Financing Transactions (SFT) like repo and reverse repo, CBLO in G-Sec are settled with guarantee by CCIL as central counterparty. Exposures (calculated as E* as given in equation A of para 15 of Appendix 3) related to SFTs settled with guarantee from CCIL will be treated as per standardised approach. Only the market repo in corporate debt securities takes place without any guarantee and without any netting provision. In future, if the counterparties in market repo enter into agreements with netting provisions (as per some master netting agreement e.g. Global Master Netting Agreement) then only para 89-93 will apply. In that case, E* mentioned in para 92 will be used for calculation of EAD and not for LGD. Effects of bilateral netting agreements (if any) covering repo-style transactions (for corporate debt securities only) will be recognised on a counterparty-by-counterparty basis if the agreements are legally enforceable upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, netting agreements must:

(a) provide the non-defaulting party the right to terminate and close-out in a timely manner all transactions under the agreement upon an event of default, including in the event of insolvency or bankruptcy of the counterparty;

(b) provide for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it so that a single net amount is owed by one party to the other; for forwards, swaps, options and similar derivative contracts, this will include the positive and negative mark to market values of individual transactions;

(c) allow for the prompt liquidation or setoff of collateral upon the event of default; and

(d) be, together with the rights arising from the provisions required in (a) to (c) above, legally enforceable in each relevant jurisdiction upon the occurrence of an event of default and regardless of the counterparty's insolvency or bankruptcy.

90. Netting across positions in the banking and trading book will only be recognised when the netted transactions fulfil the following conditions:

(a) All transactions are marked to market daily (the holding period for haircut will depend as in other repo style transactions on the frequency of margining) and

(b) The collateral instruments used in the transactions are recognised as eligible financial collateral in the banking book.

91. The formula in Equation A in para 15 of Appendix 3 will be slightly modified to calculate the EAD for capital requirements for transactions with netting agreements as mentioned in the next para.

92. For banks using the standard supervisory haircuts or own-estimate haircuts (as described in Appendix 3), the framework below will apply to take into account the impact of netting in case of repo style transactions for calculating the adjusted exposure (provided the bank is not using VaR model approach to calculate E* as described in para 31 of Appendix 3) .

$E^* = \max \{0, [(\Sigma(E) - \Sigma(C)) + \Sigma (Es \times Hs) + \Sigma (Efx \times Hfx)]\}$

(similar to the equation given in A in para15 of Appendix 3) where:

E^* = the exposure value after risk mitigation

E = current value of the exposure

C = the value of the collateral received

E_s = absolute value of the net position (long or short) in a given security(s).

H_s = haircut appropriate to E_s

E_{fx} = absolute value of the net position (long or short) in a currency different from the settlement currency

H_{fx} = haircut appropriate for currency mismatch

93. The intention here is to obtain a net exposure amount after netting of the exposures and collateral and have an add-on amount reflecting possible price

changes for the securities involved in the transactions and for foreign exchange risk if any. The net long or short position of each security included in the netting agreement will be multiplied by the appropriate haircut. All other rules regarding the calculation of haircuts stated in Appendix 3 equivalently apply for banks using bilateral netting agreements for repo-style transactions.

EAD for off balance sheet items (with the exception of FX and interest rate, equity and commodity related derivatives)

94. For off balance sheet items, exposure is calculated as the committed but undrawn amount multiplied by a credit conversion factor (CCF). Estimation of CCFs for the off balance sheet items can be done under both the foundation and advanced approaches.

CCF under Foundation Approach

95. The credit equivalent amount in relation to a non market based off-balance sheet items like direct credit substitutes, trade and performance related contingent items and other drawdown commitments etc. will be determined by multiplying the contracted amount of that particular transaction by the relevant CCF.

Where the off-balance sheet item is secured by eligible collateral or guarantee, the credit risk mitigation guidelines detailed in Appendix 3 may be applied if the mitigants are not considered for LGD calculation.

96. Where the non-market related off-balance sheet item is an undrawn or partially undrawn fund-based facility, the amount of undrawn commitment to be included in calculating the off-balance sheet non-market related credit exposures is the maximum unused portion of the commitment that could be drawn during the remaining period to maturity. Any drawn portion of a commitment forms a part of bank's on-balance sheet credit exposure.

97. In the case of irrevocable commitments to provide off-balance sheet facilities, the original maturity will be measured from the commencement of the commitment until the time the associated facility expires. For example, an irrevocable commitment with an original maturity of 15 months (50 per cent - CCF) to issue a six month

documentary letter of credit (20 per cent - CCF) would attract the lower of the CCF i.e., the CCF applicable to the six month's documentary letter of credit viz. 20 per cent.

98. The types of instruments and the CCFs applied to them are the same as those in the SA, with the exception of commitments, Note Issuance Facilities (NIFs) and Revolving Underwriting Facilities (RUFs).

99. 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 which are uncommitted, that are unconditionally cancellable, or that effectively provide for automatic cancellation, for example due to deterioration in a borrower's creditworthiness, at any time by the bank without prior notice. A CCF of 0% will be applied to these facilities.

100. 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, the bank must have sufficient monitoring and management procedures to support this contention.

101. In order to apply a 0% CCF for unconditionally and immediately cancellable corporate overdrafts and other facilities, banks must 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.

102. Where a bank has given a commitment to provide an off-balance sheet exposure, under the foundation approach it has to apply the lower of the CCFs applicable to the commitment and the off balance sheet exposure. The credit conversion factors for the non-market related off-balance sheet transactions are given as per Appendix 6.

Market related Off-balance Sheet Items

103. In calculating the off-balance sheet credit exposures arising from market related off-balance sheet items that expose the bank to counterparty credit risk, the bank should include all its market related transactions held in the banking and trading book which give rise to off-balance sheet credit risk.

The credit risk on market related off-balance sheet items is the cost to the bank of replacing the cash flow specified by the contract in the event of counterparty default. This would depend, among other things, upon the maturity of the contract and on the volatility of rates underlying the type of instrument.

104. Market related off-balance sheet items would include

a) interest rate contracts - including single currency interest rate swaps, basis swaps, forward rate agreements, and interest rate futures;

b) foreign exchange contracts, contracts involving gold, cross currency swaps (including cross currency interest rate swaps), forward foreign exchange contracts, currency futures, currency options; and

c) any other market related contracts specifically allowed by the Reserve Bank which give rise to credit risk.

105. Exemption from capital requirements is permitted for

a) foreign exchange (except gold) contracts which have an original maturity of 14 calendar days or less; and

b) instruments traded on futures and options exchanges which are subject to daily mark-to-market and margin payments.

Under both the FIRB and AIRB approaches, banks may determine EAD for market related off-balance sheet exposure according to the methods as detailed in Appendix 7.

<u>EAD under Advanced IRB Approach</u>

106. Banks that meet the minimum requirements for use of their own estimates of EAD as given in Appendix 8, will be allowed to use their internal estimates of CCFs

provided the exposures are not allotted a CCF of 100% under standardised approach (these exposures will then mandatorily have CCF of 100% even under advanced IRB as well). A bank must estimate an EAD for each facility that aims to reflect economic downturn conditions i.e. downturn EAD to capture the relevant risks. This downturn EAD cannot be less than the long-run average EAD for that type of facility.

Effective maturity (M)

107. For banks using the F-IRB approach, effective maturity (M) will be 2.5 years except for repo-style transactions where the effective maturity will be 6 months. RBI may, however, subsequently choose to require all banks (those using the foundation approach) to measure M for each facility using the definition provided below (even if the bank is using foundation IRB).

108. Banks using A-IRB approach are required to measure effective maturity for each facility as in para 109. However, if requested by a bank, RBI may exempt facilities to certain smaller domestic corporate borrowers from the explicit maturity adjustment if the reported exposure to the consolidated group based in India is less than Rs. 100 crore subject to the condition that the total exposure of the borrower is less than or equal to Rs. 5 crore from the banking system. If the exemption is applied, all exposures to qualifying smaller domestic firms as mentioned above will be assumed to have an average maturity of 2.5 years on a consistent basis, similar to foundation IRB approach.

109. Except as noted in paragraph 110, M is defined as the greater of one year and the remaining effective maturity in years as defined below. In all cases, M will be no greater than 5 years.

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

Effective Maturity (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 (expressed in number of years). However, if a bank is not in a position to calculate the effective maturity of the

contracted payments as noted above, it is allowed to use a more conservative measure of M such as that it equals 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 loan agreement. Normally, this will correspond to the nominal remaining maturity of the instrument.

110. The one-year floor principally may not apply to certain short-term exposures which are not relationship driven. Such exceptions may include fully or nearly-fully collateralised capital market-driven transactions (i.e. OTC derivatives transactions and margin lending) and repo-style transactions (i.e. repos/reverse repos and securities lending/borrowing) with an original maturity of less than one year, where the documentation contains daily re-margining clauses. For all eligible transactions, the documentation must require daily revaluation, and must include provisions that must allow for the prompt liquidation or setoff of the collateral in the event of default or failure to re-margin. The maturity of such transactions must be calculated as the greater of one-day and the effective maturity (M), consistent with the definition given in para 109. Short term self liquidating trade finance instruments (which may include issued and confirmed self liquidating letter of credit with maturity of less than a year) may also be exempted from one year floor for AIRB banks.

111. In addition to the transactions considered in paragraph 110 above, other short-term exposures with an original maturity of less than one year that are not part of a bank's ongoing financing of a borrower may be eligible for exemption from the one-year floor on a case to case basis by RBI.

112. For transactions falling within the scope of paragraph 110 and subject to a master netting agreement (if applicable), the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. A floor equal to the minimum holding period for the transaction type set out in paragraph 22 of Appendix 3 will apply to the average. Where more than one transaction type is contained in the master netting agreement, a floor equal to the highest holding period will apply to the average. Further, the notional amount of each transaction should be used for weighting maturity.

113. Where there is no explicit maturity adjustment, the effective maturity (M) assigned to all exposures is set at 2.5 years unless otherwise specified in paragraph 107.

Risk-weighted assets framework (Risk weight functions with risk component) for corporate, sovereign and bank exposures not in default

114. Risk weighted functions are used to transform risk components capital requirements and then into risk weighted assets.

115. The formula for deriving the risk weighted assets in case of corporate, sovereign and bank exposures not in default is given below. The derivation of risk-weighted assets is dependent on estimates of the PD, LGD, EAD and, in some cases, effective maturity (M), for a given exposure. For calculating risk weight assets, PD and LGD are expressed as decimals and EAD in Indian Rupees.

Correlation (R) = $0.12 * \left\{\frac{1-e^{(-50*PD)}}{1-e^{(-50)}}\right\} + 0.24 * \left[1-\left\{\frac{1-e^{(-50*PD)}}{1-e^{-50}}\right\}\right]$

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

Capital requirement

$$K = \left[LGD * N\left\{\frac{G(PD)}{(1-R)^{0.5}} + \frac{(R)^{0.5}}{(1-R)^{0.5}} * G(0.999)\right\} - LGD * PD\right] * \left[\frac{1+(M-2.5)*b}{1-1.5*b}\right]$$

.....eqn. A

Risk-weighted assets (RWA) = K*12.50*EAD.....eqn. B

Where,

K = Minimum capital requirement expressed as a percentage of EAD for the exposure

EAD= Exposure at Default

LGD= Loss Given Default of the exposure

PD= One year Probability of Default of the borrower

M= Remaining effective maturity of the exposure

R= Asset Correlation (correlation between borrower's exposure and systematic risk factor)

b= Maturity Adjustment for the exposure

N(x)= Cumulative normal distribution for a standard normal random variable (i.e. probability that a normal random variable with mean zero and variance of one is less than or equal to x)

G (z)= Inverse Cumulative normal distribution for a standard normal random variable (i.e. value of x such that N(x) = z).

Ln = Natural Logarithm

116. If the calculation for capital requirement (K) results in a negative capital charge for any individual sovereign exposure, banks should apply a zero capital charge for that exposure.

Framework for exposures in default

117. The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD (downturn) and the bank's best estimate of expected loss (as mentioned in para 71). The risk-weighted asset amount for the defaulted exposure is calculated in the same way as that in case of non-defaulted exposure i.e. product of K, 12.50, and the EAD. Restructured exposures under corporate, sovereign and bank asset classes will attract risk weight as applicable to exposures in default except for 'hardship' clauses as mentioned in para 74 of Appendix 1. However, such restructured accounts would be eligible for upgrade to the non defaulted category after observation of 'satisfactory performance' during the period of one year from the date when the first payment of interest or instalment of principal falls due under the terms of restructuring package.

Firm-size adjustment for small and medium-sized entities (SME)

118. The firm size of the borrower is assumed to have an impact on correlation and the same is therefore adjusted in the corporate risk weight formula. The firm size adjustment is, however, applicable to SME borrowers only.

119. SME borrowers under corporate asset class will be defined as those to whom the banking exposure is above Rs. 5 crore but upto Rs. 25 crore, and who are broadly

associated with SME characteristics. The firm size adjustment is based on the assumption that in the event of economic downturn, an exposure to SME borrower may be less correlated to the systematic risk than an exposure to a bigger corporate and hence the reduction in Asset Correlation.

The following firm-size adjustment is made to the corporate risk weight formula for exposures to SME borrowers.

$$0.04 * \left\{1 - \frac{S-5}{20}\right\}$$

Where S= size of the total banking exposure for the entity

The correlation formula takes the form of:

$$\text{Correlation (R)} = 0.12 * \left\{\frac{1-e^{(-50*PD)}}{1-e^{-50}}\right\} + 0.24 * \left\{1 - \frac{1-e^{(-50*PD)}}{1-e^{-50}}\right\} - 0.04 * \left\{1 - \frac{S-5}{20}\right\}$$

Treatment for specialised lending

120. Banks that meet the requirements for the estimation of PD will be able to use the general foundation approach for the corporate asset class to derive risk weights for SL sub-classes subject to RBI approval. Banks that meet the requirements for the estimation of PD and LGD and/or EAD will also be able to use the general advanced approach for the corporate asset class to derive risk weights for SL sub-classes also subject to RBI approval.

Risk weights for PF, OF, CF, and IPRE

121. Banks that do not meet the requirements for the estimation of PD under the IRB approach for SL exposures under corporate, will be required to follow the supervisory slotting criteria approach i.e. they will be required to map their internal grades to five supervisory categories (including default category), each of which is associated with a specific risk weight. This is termed as Supervisory Slotting criteria approach. The slotting criteria on which this mapping must be based are provided in Appendix 9. The risk weights for unexpected losses associated with each supervisory

category are given in the table below. Each of the Supervisory categories for Specialised Lending broadly corresponds to a range of external credit assessments which is also outlined in the table below.

Supervisory categories and UL risk weights for other SL exposures

Supervisory Categories	Strong	Good	Satisfactory	Weak	Default
UL Risk Weights	70%	90%	115%	250%	0%
External Rating Equivalent	BBB- or better	BB+ or BB	BB- or B+	B to C-	Not applicable

122. RBI may allow banks, on a case to case basis, to 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 RBI determines that banks’ underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria for the relevant supervisory risk category.

Calculation of risk-weighted assets for exposures subject to the double default framework

123. When a bank is adopting credit risk mitigation (CRM) through guarantees or credit derivatives, there may be three approaches to account for this CRM namely FIRB (bank uses RBI prescribed LGD), AIRB (bank is permitted by RBI to use its own estimate of LGD) and double default framework. This may be decided by the bank whether FIRB, AIRB or double default framework needs to be chosen.

124. To fully reflect the additional benefit obtained from the presence of credit protection i.e. both the underlying borrower and protection provider must default for a loss to be incurred and a bank might recover from both (the debtor and the protection provider) in the event of double default, the following formula may be used by the banks.

Capital requirement for a hedged exposure subject to the double default treatment (referred as K_{DD}) is calculated as under :

$$K_{DD} = K_0 * (0.15 + 160 * PD_g)$$

Where, K_0 = $$LGD_g \left[N\left(\frac{G(PD_0) + \sqrt{\rho_{0S}} * G(0.999)}{\sqrt{1-\rho_{0S}}} \right) - PD_0 \right] \left[\frac{1 + (M - 2.5) * b}{1 - 1.5 * b} \right]$$

PD_0 = PD of the Borrower (subject to PD floor of 0.03% for corporate and bank exposures)

PD_g = PD of the guarantor or credit protection provider (subject to the above floor)

M = the maturity of the credit protection (subject in all cases to a floor of one year)

b = the maturity adjustment coefficient (b) calculated as

$(0.11852 – 0.05478 \times \ln(PD))^2$, with PD being the minimum of PD_o and PD_g.

ρ_{os} = Correlation as given by the formula below (whichever is applicable)

$$0.12 * \left\{ \frac{1 - e^{(-50*PD)}}{1 - e^{(-50)}} \right\} + 0.24 * \left[1 - \left\{ \frac{1 - e^{(-50*PD)}}{1 - e^{-50}} \right\} \right]$$

Or,

$$= 0.12 * \left\{ \frac{1 - e^{(-50*PD)}}{1 - e^{-50}} \right\} + 0.24 * \left\{ 1 - \frac{1 - e^{(-50*PD)}}{1 - e^{-50}} \right\} - 0.04 * \left\{ 1 - \frac{S - 5}{20} \right\}$$

with PD being equal to PD_o in the above correlation formula, and

LGD_g is the LGD of a comparable direct exposure to the guarantor/protection provider. This is the LGD associated with an unhedged facility to the guarantor or the unhedged facility to the borrower (in case LGD of the guarantor results in higher capital requirements), depending upon whether, in the event both the guarantor and the borrower default during the life of the hedged transaction, available evidence and the structure of the guarantee indicate that the amount recovered would depend on the financial condition of the guarantor or borrower, respectively.

125. In this context, when there is partial coverage of an exposure by a guarantee/credit derivative and there is a difference in seniority between the covered portion and the uncovered portion of the exposure, the arrangement will be considered as securitisation and the treatment of the same will be as per the securitisation framework of this document.

126. Only single name credit default swaps (CDS) (as permitted by RBI) and single name guarantees will be considered as eligible risk mitigants for banks for using Double Default Framework. The other operational criteria to be met, for banks to use this framework are given below:

(i) The risk weight that is associated with the exposure prior to the application of double default framework does not reflect any aspect of the credit protection provided by the guarantee of credit derivative.

(ii) The entity selling credit protection (CDS) must be a bank or a primary dealer (or any other entity as permitted by RBI). The eligible guarantor/credit protection provider must have an internal rating of A- or equivalent. Subsequently, during the tenor of the contract, this internal rating should not come below a rating which is equivalent to an external rating of investment grade.

(iii) The underlying exposure in the Double default framework must be a corporate exposure (with the exception of Specialised Lending exposures which are subject to supervisory slotting) as detailed in this guideline or an exposure to PSE.

(iv) The underlying borrowers which is availing risk mitigation should not be a financial company or member of the same group as the guarantee/credit protection provider.

(v) The credit protection or guarantee availed must be complying with all the requirements as given in Appendix 5 of this guideline.

(vi) The bank has the right to receive payment from the guarantor/credit protection provider without having to take legal action in order to pursue the counterparty for payment.

(vii) The credit protection provided by the guarantee or the credit derivative absorbs all credit losses incurred on the covered portion of the exposure that arise due to the credit events detailed in the contract between the parties.

(viii) If the payment structure of the credit protection provides for physical settlement, the bank should have legal certainty with respect to the deliverability of a loan, bond or contingent liability. If the bank intends to deliver an obligation other than the underlying exposure, it must ensure that the deliverable obligation is sufficiently liquid so that the bank has the ability to purchase it for delivery in accordance with the contract.

(ix) The terms and conditions of the credit protection contract are legally confirmed by the guarantor/credit protection provider and the bank.

(x) There is no excessive correlation between the creditworthiness of the guarantor or credit protection provider and the debtor of the underlying exposure due to their performance being dependent on common factors beyond the systematic risk factor. The bank should preferably have procedures in place to detect such excessive correlation.

(xi) The bank should have the right to receive payment from guarantor/credit protection provider without having to take legal action in order to pursue the counterparty for payment.

127. In estimating either of these LGDs, a bank may recognise either the collateral posted exclusively against the exposure or credit protection, in a manner consistent with the foundation IRB or Advanced IRB approach as applicable. There may not be any consideration of double recovery in the LGD estimate.

128. The risk-weighted asset amount is calculated in the same way as for unhedged exposures, i.e.

$RWA_{DD} = K_{DD} \times 12.50 \times EAD_g$.

129. The treatments to Purchased corporate receivables and Purchased retail receivables have been prescribed in para 97-98 of Appendix 1 and also in Appendix 10.

Section C

Rules for Retail Exposure

130. Claims (include both fund-based and non-fund based) that meet four criteria listed in paragraph 132 and not relationship driven, may be considered as retail claims for regulatory capital purposes and included in a regulatory retail portfolio.

131. The following claims, both fund based and non fund based, shall be excluded from the regulatory retail portfolio*:*

(a) Exposures by way of investments in securities (such as bonds and equities), whether listed or not;

(b) Loans and advances to banks' own staffs which are fully covered by superannuation benefits and / or mortgage of flat / house;

(c) Capital market exposures;

(d) Venture capital funds.

Capital calculation for the exposures mentioned in (b) and (d) will be treated as per RBI directives of standardised approach of Basel II. Exposure to bonds will be under corporate asset class. Exposure to capital market, as detailed in para 153 (iii), will be treated under equity asset class.

132. Qualifying Criteria

(i) Orientation Criterion - The exposure (both fund-based and non fund-based) is to an individual person or persons (regardless of the size of exposure) or to a small business; Person under this clause would mean any legal person capable of entering into contracts and would include but not be restricted to individual, HUF, partnership firm, trust, private limited companies, public limited companies, co-operative societies, small businesses etc. Small business is one where the total average annual turnover is less than Rs.25 crore. The turnover criterion will be linked to the average of the last three years in the case of existing entities; projected turnover in the case of new entities; and both actual and projected turnover for entities which are yet to complete three years.

(ii) Product Criterion - The exposure (both fund-based and non fund-based) takes the form of any of the following: revolving credits and lines of credit (including

overdrafts), term loan and leases (e.g. instalment loans, leases and educational loans) and small business facilities and commitments.

(iii) Granularity Criterion - Banks must ensure that the regulatory retail portfolio is sufficiently diversified to a degree that reduces the risks in the portfolio, so as to treat them under retail assets. One way of achieving this is that no aggregate exposure to one counterpart should exceed 0.2 per cent of the overall regulatory retail portfolio. 'Aggregate exposure' means gross amount (i.e. not taking any benefit for credit risk mitigation into account) of all forms of exposures (e.g. loans or commitments) that individually satisfy the three other criteria. In addition, 'one counterpart' means one or several entities that may be considered as a single beneficiary (e.g. in the case of a small business that is affiliated to another small business, the limit would apply to the bank's aggregated exposure on both businesses). While banks may appropriately use the group exposure concept for computing aggregate exposures, they should evolve adequate systems to ensure strict adherence with this criterion. NPAs under retail loans are to be excluded from the overall regulatory retail portfolio when assessing the granularity criterion for risk-weighting purposes.

(iv) Low Value of Individual Exposures - The maximum aggregated retail exposure to one counterpart, except for individual person or persons as mentioned in para 132 (i), should be less than the threshold limit of Rs. 5 crore.

133. For the purpose of ascertaining compliance with the absolute threshold, exposure would mean sanctioned limit or the actual outstanding, whichever is higher, for all fund based and non-fund based facilities, including all forms of off-balance sheet exposures. In the case of term loans and EMI based facilities, where there is no scope for redrawing any portion of the sanctioned amounts, exposure shall mean the actual outstanding.

134. RBI would evaluate at periodic intervals, the bank’s processes and estimates of PD, LGD, EAD assigned to the retail portfolio with reference to the default experience for these exposures. As part of the supervisory review and evaluation process, the RBI would also consider whether the credit quality of regulatory retail claims held by individual banks should warrant a more conservative estimate of PD, LGD and EAD than that arrived by the banks.

135. The exposure must be one of a large pool of exposures, which are managed by the bank on a pooled basis. Furthermore, these must not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or homogeneous pool of exposures with similar risk characteristics for 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 deny the eligibility as a retail exposure.

Sub Classification of retail assets

136. Within the retail asset class category, banks are required to identify separately three sub-classes of exposures: (a) exposures secured by residential properties, (b) qualifying revolving retail exposures and (c) all other retail exposures subject to the condition that these exposures broadly meet the retail asset criteria as mentioned in para 132. Exposures secured by residential properties and qualifying revolving retail exposures are mentioned below. Retail exposures which may not be categorised under these two heads will fall under 'other retail' asset category which may include agricultural and allied activities and SME loans provided these comply with retail criteria.

Exposures secured by residential properties

137. Loans secured by mortgage of residential properties may be eligible for retail treatment provided the credit is extended to an individual, which should not include credit extended to builders/developers.

Qualifying revolving retail exposures

138. All of the following criteria must be satisfied for a sub-portfolio to be treated as a qualifying revolving retail exposure (QRRE). These criteria must be applied at a sub-portfolio level consistent with the bank's segmentation of its retail activities. Segmentation at the country level (or below) should be the general rule.

(a) 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 the bank.

(b) The exposures are to individuals.

(c) Because the asset correlation assumptions for the QRRE risk-weight function are markedly below those for the other retail risk-weight function at low PD values, banks must 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. RBI will review the relative volatility of loss rates across the QRRE sub portfolios, as well as the aggregate QRRE portfolio.

(d) Data on loss rates for this sub-portfolio must be retained in order to allow analysis of the volatility of loss rates.

(e) The bank must demonstrate satisfactorily that treatment as a qualifying revolving retail exposure is consistent with the underlying risk characteristics of the sub-portfolio.

Implementation plan

139. A bank, while submitting the detailed implementation plan for rollout of IRB approaches across significant asset classes, should specify a detailed plan for retail assets including its sub-classes. The plan should specify the extent to which the bank seeks to implement the IRB Approach for various sub-classes of retail assets, the methodology proposed to be used for calculation of various risk components i.e. PD, LGD and EAD, data characteristics and the timeline for the rollout. Some exposures in certain sub-classes in case of retail assets may be immaterial in terms of size and perceived risk profile. For such cases, the bank should specifically seek permission of the RBI to exempt it from applying the IRB approach. Capital requirements for such exposures should be calculated according to the Standardised approach or as specified by Reserve Bank of India. However, RBI may refuse such exemption or apply more capital under Pillar 2.

Transition Arrangements

140. At the beginning of the transition period, a bank must demonstrate that it has been using a rating system which was broadly in line with the minimum requirements articulated in this document for at least three years prior to qualification to these approaches.

IRB Approach for Retail Exposure

141. For retail assets, there is no distinction between Foundation and Advanced approaches and hence banks have to calculate their own PD, LGD and EAD. There is no maturity adjustment necessary in the risk weight function for capital calculation.

Risk components

Calculation of PD & LGD

142. For each identified homogeneous pool of exposures, banks are expected to provide an estimate of the PD and LGD associated with the pool, subject to the prescribed minimum requirements in this guideline. Further, the PD for retail exposure is greater of the one year PD associated with the internal borrower grade to which the pool has been assigned or 0.03%. The minimum data observation period for PD and LGD estimates for retail exposure is 5 years. However, the banks may give different weightage to historic data provided it can demonstrate that more recent data is a better predictor of loss rates. Further, because of the potential for very long cycles in house prices, LGDs for retail exposures secured by residential properties cannot be set below 20% for using in the formula given in para 148 (with correlation applicable for exposures secured by residential mortgage properties).

Calculation of EAD

143. All retail exposures (both on and off balance sheet) 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 a bank's regulatory capital would be reduced if the exposure is fully written off and (ii) any specific provisions and partial write-offs. For retail off balance sheet items, banks must use their own estimates of Credit Conversion Factors subject to the prescribed minimum requirements for EAD in this guideline. The minimum data observation period for EAD estimates for retail exposure is 5 years.

Recognition of Guarantees and Credit derivatives

144. Banks may reflect the risk reducing effects of guarantees (whether to an individual obligation or pool of exposures) and credit derivatives by adjusting either the Probability of Default or Loss Given Default estimates, subject to the minimum requirements as given in Appendix 5 of this guideline.

On balance sheet netting

145. On balance sheet netting of loans and deposits of a bank from a retail customer will be permitted subject to the same conditions outlined in paragraph 87-88 of this guideline.

146. For retail exposures with uncertain future drawdown such as credit cards, the banks should adjust its estimates of LGD or EAD to reflect the possibility of additional drawings prior to default. The adjustment should reflect the past experience/history or expectation of such additional drawing prior to default.

147. When the drawn balances of the retail facilities have been securitised, banks should hold capital against their share (i.e. seller's interest) of undrawn balances related to the securitised exposures. The undrawn balances of such securitised exposures should be divided between the seller's and investor's interests on a pro rata basis. The investor's interest should be subject to the treatment given in this circular for securitisation exposures.

Risk Weight Function for retail assets

Risk Weight Function for retail assets not in default

148. The Risk weight functions for three different classes of retail exposures are described below. These functions must be used by banks along with their estimates of PD, LGD and EAD for calculation of capital and risk weighted assets. For retail exposures not in default, the risk weights will be assigned as per the following function:

Capital requirement $K = \left[LGD * N\left\{ \frac{G(PD)}{(1-R)^{0.5}} + \frac{(R)^{0.5}}{(1-R)^{0.5}} * G(0.999) \right\} - LGD * PD \right]$

Risk weighted assets = K × 12.5 × EAD

Correlation (R) for residential mortgage exposures = 0.15

Correlation (R) for Qualifying revolving retail exposures = 0.04

Correlation (R) for all other retail exposures =

$$\left[0.03*\left\{\frac{1-e^{-35*PD}}{1-e^{-35}}\right\}+0.16*\left\{1-\frac{1-e^{-35*PD}}{1-e^{-35}}\right\}\right]$$

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 x such that N(x) = z).

Risk Weight Framework for retail assets in default

149. The capital requirement for a defaulted retail exposure is equal to the greater of zero and the difference between its LGD and the bank's best estimate of expected loss as given in para 71 of this circular. The risk weighted asset amount for the defaulted exposure is the product of K, 12.5 and the EAD.

Restructured retail exposures

150. Restructured retail exposures will attract risk weight as applicable to defaulted retail assets as mentioned in the para 149 barring the cases where 'hardship' clauses (as mentioned in para 74 in Appendix 1) might have been extended to the exposures. However, all such restructured exposures would be eligible for treatment as under non defaulted category after observation of 'satisfactory performance' during the period of one year from the date when the first payment of interest or instalment of principal falls due under the terms of restructuring package.

Treatment of Expected losses and Provisions

151. Treatment of expected loss and provisions applicable to retail exposures have been discussed along with corporate, bank and sovereign exposures in para 191 to 203.

Section D

Rules for Equity Exposures

Definition of Equity Exposures

152. RWA for equity exposures detailed here is meant for the equity exposures lying in the banking book (HTM and AFS) of the banks. RWA for equity exposures lying in the trading book (HFT) will be calculated as per market risk guidelines. In general, equity exposures are defined on the basis of the economic substance of the instrument. They include both direct and indirect ownership interests, 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. 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.

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.

153. Additionally, any of the following instruments must be categorised as an equity exposure:

(i) An instrument with the same structure as those permitted as Tier 1 capital for banking organisations.

(ii) An instrument that embodies an obligation on the part of the issuer and meets any of the following conditions:

(a) The issuer may defer indefinitely the settlement of the obligation;

(b) The obligation requires (or permits at the issuer's discretion) settlement by issuance of a fixed number of the issuer's equity shares;

(c) The obligation requires (or permits at the issuer's discretion) settlement by issuance of a variable number of the issuer's equity shares and (ceteris paribus) any change in the value of the obligation is attributable to and comparable to, and in the same direction as the change in the value of a fixed number of the issuer's equity shares; or

(d) 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 RBI is satisfied that the bank 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, RBI is content that the bank has demonstrated that the instrument should be treated as a debt position. In cases (i) and (ii), the bank may decompose the risks for regulatory purposes, with the consent of RBI.

(iii) An instrument that can be categorised under Capital Market Exposure. In case of advances/guarantees issued to stock brokers/market makers which are secured by primary or collateral security by way of equity, convertible bonds, etc. they may be categorised under Equity. However, if such instruments are not secured by primary or collateral security by way of equity, convertible bonds, etc. they may be categorised either under Corporate or retail asset class, depending on type of exposure and the borrower.

154. Debt obligations and other securities, partnerships, derivatives or other vehicles structured with the intent of conveying the economic substance of equity ownership are considered an equity holding. This includes liabilities from which the return is linked to that of equities. Conversely, equity investments that are structured with the intent of conveying the economic substance of debt holdings or securitisation exposures would not be considered an equity holding, subject to the approval of RBI. Equities that are recorded as loans 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 what would apply if the holdings remained in the debt portfolio.

155. The RBI reserves the right to re-characterize debt holdings as equities for regulatory purposes and to otherwise ensure the proper treatment of holdings under Pillar-II.

156. In general, the measure of an equity exposure on which capital requirements

is based is the value presented in the financial statements, which depending on national accounting and regulatory practices may include unrealised revaluation gains (once IFRS accounting standard becomes applicable for Indian banks). Thus, for example, equity exposure measures will be:

(i) 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.

(ii) For investments held at fair value with changes in value not flowing through income but into a tax-adjusted separate component of equity, exposure is equal to the fair value presented in the balance sheet.

(iii) For investments held at cost or at the lower of cost or market, exposure is equal to the cost or market value presented in the balance sheet.

157. 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.

158. 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 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 the bank has rated all the potential constituents of such a fund.

159. There are two approaches to calculate risk-weighted assets for equity exposures held in the banking book:

(i) Market-based approach.

(ii) PD/LGD approach.

160. Certain equity holdings are excluded as defined in paragraphs 173-176 given below and are subject to the capital charges required under the standardised approach. PD/LGD approach will be available to the banks only if they have adopted

A-IRB approach for all other asset types. Where both methodologies are permitted by RBI, banks' choices must be made consistently, and in particular not determined by regulatory arbitrage considerations.

Market-based approach

161. Under the market-based approach, banks are permitted to calculate the minimum capital requirements for credit risk for their banking book equity holdings using either or both of two following methods:

(i) Simple risk weight method.

(ii) Internal models method.

The method used should be consistent with the amount and complexity of the bank's equity holdings and commensurate with the overall size and sophistication of the bank. However, RBI may require the use of either method based on the individual circumstances of a bank.

Simple risk weight method

162. Under the simple risk weight 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 securities traded on a security exchange recognised by SEBI or other national securities regulatory authority and provide a liquid two way market for the exposures.

Internal models method

163. Under this alternative, banks must hold capital equal to the potential loss on the bank's equity holdings as derived 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. The capital charge would be incorporated into a bank's risk-based capital ratio through the calculation of risk-weighted equivalent assets.

164. The risk weight used to convert holdings into risk-weighted equivalent assets would be calculated by multiplying the derived capital charge by 12.50. Capital charges calculated under the internal models method may be no less than the

capital charges that would be 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 would be calculated separately using the methodology of the simple risk weight approach. Further, these minimum risk weights are to apply at the individual exposure level rather than at the portfolio level.

165. A bank may be permitted to employ different market-based approaches to different portfolios based on appropriate considerations and where the bank itself uses different approaches internally.

166. Banks 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.

PD/LGD approach

167. The minimum requirements and methodology for the PD/LGD approach for equity exposures are the same as those for the IRB foundation approach for corporate exposures subject to the following specifications:

(i) The bank's estimate of the PD of a corporate entity in which it holds an equity position must satisfy the same requirements as the bank's estimate of PD of a corporate entity where the entity owes debt to the bank. If a bank has not extended debt to 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 bank. If, however, the bank's equity holdings are material and it is permitted to use a PD/LGD approach for regulatory purposes but the bank has not yet met the relevant standards, the simple risk-weight method under the market-based approach will apply.

(ii) An LGD of 90% would be assumed in deriving the risk weight for equity exposures.

(iii) For these purposes, the risk weight is subject to a five-year maturity adjustment (i.e. M=5 in the formula as given in eqn. A in para 115) whether or not the bank is using the explicit approach to maturity elsewhere in its IRB portfolio.

168. Under the PD/LGD approach, minimum risk weights as given in the paragraph 169 below would apply. When the sum of UL and EL associated with the

equity exposure results in less capital than would be required from application of one of the minimum risk weights, the minimum risk weights must be used. In other words, the minimum risk weights must be applied, if the risk weights, calculated according to paragraph 167 plus the EL associated with the equity exposure multiplied by 12.5 are smaller than the applicable minimum risk weights.

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

(i) 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 capital gains in the long term. It is expected that in almost all cases, the bank will have lending and/or general banking relationships with the portfolio company so that the estimated probability of default 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 the bank will hold the equity over the long term (at least five years).

(ii) 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 capital gain or of realising any existing gain.

170. For all other equity positions, capital charges calculated under the PD/LGD approach may be no less than the capital charges that would be 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.

171. The maximum risk weight for the PD/LGD approach for equity exposures is 1111%. This maximum risk weight can be applied, if risk weights calculated according to paragraph 167 plus the EL associated with the equity exposure multiplied by 12.5 exceed the 1111% risk weight.

172. Calculating capital requirement for hedged equity exposures (by means of credit derivatives) under PD/LGD method is also possible. If there is both a protected and an unprotected portion of the exposure then the protected portion will be assigned PD of the protection provider (or a PD above the PD of the protection provider but below the PD of the obligor) with LGD of 90% and maturity of 5 years and using the risk weight function as given in para 115. For the unprotected portion, method for

computing capital requirement would be the same except that the PD used should be of the obligor.

Exclusions to the market-based and PD/LGD approaches

173. Equity holdings in entities, if any, whose debt obligations qualify for a zero risk weight under the standardised approach to credit risk, can be excluded from the IRB approaches to equity, at the discretion of the RBI.

174. To promote specified sectors of the economy, RBI may exclude from the IRB capital charges, equity investments made under legislated programmes that provide significant subsidies for the investment to the bank and involve some form of government oversight and restrictions on the equity investments.

175. Equity holdings made under legislated programmes can only be excluded from the IRB approaches up to an aggregate of 10% of Tier 1 plus Tier 2 capital.

176. RBI may also exclude the equity exposures of a bank from the IRB treatment based on materiality. The equity exposures of a bank are considered material if aggregate value of equity exposures in banking book exceeds 0.5% of total banking book exposures, excluding all legislative programmers as discussed above in para 174.

<u>Minimum Requirements specific to equity exposures under internal models market-based approach</u>

177. To be eligible for the internal models market-based approach, a bank must demonstrate that it meets certain quantitative and qualitative minimum requirements at the outset and on an ongoing basis. Failure to meet these requirements will render banks ineligible to use the internal models market-based approach. A bank that fails to demonstrate continued compliance with the minimum requirements must develop a plan for rapid return to compliance, obtain RBI's approval of the plan, and implement that plan in a timely fashion. In the interim, banks would be expected to compute capital charges using a simple risk weight approach.

178. The following minimum standards apply for the purpose of calculating minimum

capital charges under the internal models approach.

(i) The capital charge is equivalent to the potential loss on the institution's equity portfolio arising from an assumed instantaneous shock equivalent 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.

(ii) The estimated losses should be sensitive to adverse market movements relevant to the long-term risk profile of the institution's specific holdings. The data used to represent return distributions should reflect the longest sample period for which data are available and meaningful in representing the risk profile of the bank's specific equity holdings. The data used should be sufficient to provide conservative, statistically reliable and robust loss estimates that are not based purely on subjective or judgmental considerations. Banks must demonstrate to RBI that the shock employed provides a conservative estimate of potential losses over a relevant long-term market or business cycle.

Models, if estimated, by using data not reflecting realistic ranges of long-run experience, including a period of reasonably severe declines in equity market values relevant to a bank's holdings, are presumed to produce optimistic results unless there is credible evidence of appropriate adjustments built into the model. In the absence of built-in adjustments, the bank must combine empirical analysis of available data with adjustments based on a variety of factors in order to attain model outputs that achieve appropriate realism and conservatism.

In constructing Value at Risk (VaR) models estimating potential quarterly losses, banks may use quarterly data or convert shorter horizon period data to a quarterly equivalent using an analytically appropriate method supported by empirical evidence. Such adjustments must be applied through a well-developed and well-documented thought process and analysis. In general, adjustments must be applied conservatively and consistently over time. Furthermore, where only limited data are available or where technical limitations are such that estimates from any single method will be of uncertain quality, banks must add appropriate margins of conservatism in order to avoid over-optimism.

(iii) No particular type of VaR model (e.g. variance-covariance, historical simulation, or Monte Carlo) is prescribed. However, the model used must be able to capture adequately all of the material risks embodied in equity returns including both the general market risk and specific risk exposure of the institution's equity portfolio. Internal models must adequately explain historical price variation, capture both the magnitude and changes in the composition of potential concentrations, and be robust to adverse market environments. The population of risk exposures represented in the data used for estimation must be closely matched to or at least comparable with those of the bank's equity exposures.

(iv) Banks may also use modelling techniques such as historical scenario analysis to determine minimum capital requirements for banking book equity holdings. The use of such models is conditioned upon the bank demonstrating to RBI that the methodology and its output can be quantified in the form of the loss percentile specified under (a).

(v) Banks must use an internal model that is appropriate for the risk profile and complexity of their equity portfolio. Banks with material holdings with values that are highly non-linear in nature (e.g. equity derivatives, convertibles) must employ an internal model designed to capture appropriately the risks associated with such instruments.

(vi) Subject to RBI review, equity portfolio correlations can be integrated into a bank's internal risk measures. The use of explicit correlations (e.g. utilisation of a variance/covariance VaR model) must be fully documented and supported using empirical analysis. The appropriateness of implicit correlation assumptions will be evaluated by supervisors in their review of model documentation and estimation techniques.

(vii) Mapping of individual positions to proxies, market indices, and risk factors should be plausible, intuitive, and conceptually sound. Mapping techniques and processes should be fully documented, and demonstrated with both theoretical and empirical evidence to be appropriate for the specific holdings. Where professional judgement is combined with quantitative techniques in estimating a holding's return volatility, the judgement must take into account the relevant and material information not considered by the other techniques utilised.

(viii) Where factor models are used, either single or multi-factor models are acceptable depending upon the nature of an institution's holdings. Banks are expected to ensure that the factors are sufficient to capture the risks inherent in the equity portfolio. Risk factors should correspond to the appropriate equity market characteristics (for example, public, private, market capitalisation, industry sectors and sub-sectors, operational characteristics) in which the bank holds significant positions. While banks will have discretion in choosing the factors, they must demonstrate through empirical analyses the appropriateness of those factors, including their ability to cover both general and specific risk.

(ix) Estimates of the return volatility of equity investments must incorporate relevant and material available data, information, and methods. A bank may utilise independently reviewed internal data or data from external sources (including pooled data). The number of risk exposures in the sample, and the data period used for quantification must be sufficient to provide the bank with confidence in the accuracy and robustness of its estimates. Banks should take appropriate measures to limit the potential of both sampling bias and survivorship bias in estimating return volatilities.

(x) A rigorous and comprehensive stress-testing programme must be in place. Banks are expected to subject their internal model and estimation procedures, including volatility computations, to either hypothetical or historical scenarios that reflect worst-case losses given underlying positions in both public and private equities. At a minimum, stress tests should be employed to provide information about the effect of tail events beyond the level of confidence assumed in the internal models approach.

Risk management process and controls

179. Banks' overall risk management practices used to manage their banking book equity investments are expected to be consistent with the evolving sound practice guidelines issued by the RBI. With regard to the development and use of internal models for capital purposes, banks must have established policies, procedures, and controls to ensure the integrity of the model and modelling process used to derive regulatory capital standards. These policies, procedures, and controls should include the following:

(i) Full integration of the internal model into the overall management information systems of the institution and in the management of the banking book equity portfolio. Internal models should be fully integrated into the institution's risk management infrastructure including use in: (a) establishing investment hurdle rates and evaluating alternative investments if any; (b) measuring and assessing equity portfolio performance (including the risk-adjusted performance); and (c) allocating economic capital to equity holdings and evaluating overall capital adequacy as required under Pillar 2. The bank should be able to demonstrate through, for example, investment committee minutes, that internal model output plays an essential role in the investment management process.

(ii) Established management systems, procedures, and control functions for ensuring the periodic and independent review of all elements of the internal modelling process, including approval of model revisions, vetting of model inputs, and review of model results, such as direct verification of risk computations. Proxy and mapping techniques and other critical model components should receive special attention. These reviews should assess the accuracy, completeness, and appropriateness of model inputs and results and focus on both finding and limiting potential errors associated with known weaknesses and identifying unknown model weaknesses. Such reviews may be conducted as part of internal or external audit programmes, by an independent risk control unit, or by an external third party.

(iii) Adequate systems and procedures for monitoring investment limits and the risk exposures of equity investments.

(iv) The units responsible for the design and application of the model must be functionally independent from the units responsible for managing individual investments.

(v) Parties responsible for any aspect of the modelling process must be adequately qualified. Management must allocate sufficient skilled and competent resources to the modelling function.

Validation and documentation

180. Banks employing internal models for regulatory capital purposes are expected to have in place a robust system to validate the accuracy and consistency of the

model and its inputs. They must also fully document all material elements of their internal models and modelling process. The modelling process itself as well as the systems used to validate internal models including all supporting documentation, validation results, and the findings of internal and external reviews are subject to oversight and review by the bank's supervisor.

Validation

181. Banks must have a robust system in place to validate the accuracy and consistency of their internal models and modelling processes. A bank must demonstrate that the internal validation process enables it to assess the performance of its internal model and processes consistently and meaningfully.

182. Banks must regularly compare actual return performance (computed using realised and unrealised gains and losses) with modelled estimates and be able to demonstrate that such returns are within the expected range for the portfolio and individual holdings. Such comparisons must make use of historical data that are over as long a period as possible. The methods and data used in such comparisons must be clearly documented by the bank. This analysis and documentation should be updated at least annually.

183. Banks should make use of other quantitative validation tools and comparisons with external data sources. The analysis must be based on data that are appropriate to the portfolio, are updated regularly, and cover a relevant observation period. Banks' internal assessments of the performance of their own model must be based on long data histories, covering a range of economic conditions, and ideally one or more complete business cycles.

184. Banks must demonstrate that quantitative validation methods and data are consistent through time. Changes in estimation methods and data (both data sources and periods covered) must be clearly and thoroughly documented.

185. Since the evaluation of actual performance to expected performance over time provides a basis for banks to refine and adjust internal models on an ongoing basis, it is expected that banks using internal models will have established well-articulated model review standards. These standards are especially important for

situations where actual results significantly deviate from expectations and where the validity of the internal model is called into question. These standards must take account of business cycles and similar systematic variability in equity returns. All adjustments made to internal models in response to model reviews must be well documented and consistent with the bank's model review standards.

186. To facilitate model validation through backtesting on an ongoing basis, banks using the internal model approach must construct and maintain appropriate databases on the actual quarterly performance of their equity investments as well on the estimates derived using their internal models. Banks should also backtest the volatility estimates used within their internal models and the appropriateness of the proxies used in the model. RBI may ask banks to scale their quarterly forecasts to a different, in particular shorter, time horizon, store performance data for this time horizon and perform back tests on this basis.

Documentation

187. The burden is on the bank to satisfy RBI that a model has good predictive power and that regulatory capital requirements will not be distorted as a result of its use. Accordingly, all critical elements of an internal model and the modelling process should be fully and adequately documented. Banks must document in writing their internal model's design and operational details. The documentation should demonstrate banks' compliance with the minimum quantitative and qualitative standards, and should address topics such as the application of the model to different segments of the portfolio, estimation methodologies, responsibilities of parties involved in the modelling, and the model approval and model review processes. In particular, the documentation should address the following points:

(a) A bank must document the rationale for its choice of internal modelling methodology and must be able to provide analyses demonstrating that the model and modelling procedures are likely to result in estimates that meaningfully identify the risk of the bank's equity holdings. Internal models and procedures must be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions. In addition, a bank must document a

history of major changes in the model over time and changes made to the modelling process subsequent to the last supervisory review. If changes have been made in response to the bank's internal review standards, the bank must document that these changes are consistent with its internal model review standards.

(b) In documenting their internal models, banks should:

- provide a detailed outline of the theory, assumptions and/or mathematical and empirical basis of the parameters, variables, and data source(s) used to estimate the model;
- establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the selection of explanatory variables; and
- indicate circumstances under which the model does not work effectively or limitations of the model.

188. Where proxies and mapping are employed, banks must have performed and documented rigorous analysis demonstrating that all chosen proxies and mappings are sufficiently representative of the risk of the equity holdings to which they correspond. The documentation should show, for instance, the relevant and material factors (e.g. business lines, balance sheet characteristics, geographic location, company age, industry sector and subsector, operating characteristics) used in mapping individual investments into proxies. In summary, banks must demonstrate that the proxies and mappings employed:

- are adequately comparable to the underlying holding or portfolio;
- are derived using historical economic and market conditions that are relevant and material to the underlying holdings or, where not, that an appropriate adjustment has been made; and, are robust estimates of the potential risk of the underlying holding.

Risk weight for 'others' asset class

189. In addition to all these (five) asset classes if the banks have some exposures which can be classified as 'others' assets, then these assets may directly be assigned risk weights as per the prescriptions given in Standardised Approach.

Treatment of expected loss and provisions

190. This section of the guideline states the method by which difference between total eligible provisions and expected loss (EL) may be included in or deducted from regulatory capital.

Calculation of expected losses

191. To obtain a total EL amount, bank must add up the EL amount (defined as PD*LGD multiplied by EAD) associated with its (individual) exposures (excluding the EL amount associated with equity exposures under the PD/LGD approach and securitisation exposures). While the EL amount associated with equity exposures subject to the PD/LGD approach is excluded from the total EL amount, paragraphs 192 and 203 apply to such exposures.

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

192. Banks must calculate an EL as PD*LGD multiplied by EAD for corporate, sovereign, bank, and retail exposures which are not treated as hedged exposures under the double default treatment. For corporate, sovereign, bank, and retail exposures that are in default, banks must use their best estimate of expected loss as defined in paragraph 71 and banks on the foundation approach must use the supervisory LGD. For SL exposures subject to the supervisory slotting criteria, EL is calculated as described in paragraphs 193 and 194. For equity exposures subject to the PD/LGD approach, the EL is calculated as PD * LGD multiplied by EAD unless paragraphs 168-169 and 171 apply. Securitisation exposures do not contribute to the EL amount. For all other exposures, including hedged exposures under the double default treatment, the EL is zero.

Expected loss for SL exposures subject to the supervisory slotting criteria

193. For SL exposures subject to the supervisory slotting criteria, the EL amount is -9% of the risk-weighted assets produced from the appropriate risk weights, as specified below, multiplied by EAD.

Supervisory categories and EL risk weights for other SL exposures

194. The risk weights for SL are as follows:

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

195. Where, RBI allows banks to assign preferential risk weights to other SL exposures falling into the "strong" and "good" supervisory categories as outlined in paragraph 122 of this document, the corresponding EL risk weight is 0% for "strong" exposures, and 5% for "good" exposures.

Calculation of provisions

Exposures subject to IRB approach

196. 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) that are attributed to 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 must not be included in total eligible provisions.

Portion of exposures subject to the standardised approach to credit risk

197. Banks using the standardised approach for a portion of their credit risk exposures, either on a transitional basis (as defined in paragraphs 25, 26), or on a permanent basis and if the exposures subject to the standardised approach are immaterial (as mentioned earlier in paragraph 28), the bank must determine the portion of general provisions to be attributed to the standardised or IRB treatment of provisions as per the methods outlined in following two paragraphs.

198. Banks should generally attribute total general provisions on a pro rata basis according to the proportion of credit risk-weighted assets subject to the standardised and IRB approaches. However, when one approach to determining credit risk-weighted assets (e.g. standardised or IRB approach) is used exclusively within an entity, general provisions booked within the entity may be attributed to that approach only (e.g. standardised or IRB approach).

199. Subject to the RBI approval on a case to case basis, banks using both the standardised and IRB approaches may also rely on their internal methods for allocating general provisions for recognition in capital under either the standardised or IRB approach, subject to the condition that where the internal allocation method is made available, RBI will establish the standards surrounding their use. Further, banks will need to obtain prior approval from RBI to use an internal allocation method for this purpose.

Sufficiency of provisions to meet EL

200. Banks using the IRB approach must compare the amount of total eligible provisions (as defined in paragraph 196) with the total EL amount as calculated within the IRB approach (as defined in paragraph 191). If the total eligible provisions are over and above the EL amount, the excess can be included in Tier 2 capital up to a maximum of 0.6% of credit risk weighted assets.

201. However, where the calculated EL amount is lower than the provisions of the bank, RBI will consider whether the EL fully reflects the conditions in the market in which it operates before allowing the difference to be included in Tier 2 capital. Further, comparison of the amount of eligible provisions and EL may be done separately for defaulted and non-defaulted exposures. Excess of eligible provisions over EL for defaulted assets may not be allowed to compensate lower general provisioning for non-defaulted exposures unless RBI is satisfied that the EL fully reflects the conditions in the market in which it operates.

202. Where the total EL amount exceeds total eligible provisions, banks must deduct the difference from its common equity (subject to transitional arrangements under Basel III).

203. The full EL amount for equity exposures under the PD/LGD approach will be risk weighted at 1111% to derive the capital requirement for the same. Provisions or write-offs for equity exposures under the PD/LGD approach will not be used in the EL-provision calculation.

Section E

Credit Risk – Securitisation Framework

An overview

204. A securitisation exposure, as defined in RBI 'Guidelines on Securitisation of Standard Assets', issued vide circular DBOD.No.BP.BC.60/ 21.04.048/ 2005-06 dated February 1, 2006, would qualify for the following prudential treatment of securitisation exposures for capital adequacy purposes. Banks' exposures to a securitisation transaction, referred to as securitisation exposures, can include, but are not restricted to the following: as investor, as credit enhancer, as liquidity provider, as underwriter, as provider of credit risk mitigants and cash collaterals provided as credit enhancements. Repurchased securitisation exposures should be treated as retained securitisation exposures. Further, as securitisation may be structured in many different ways, the capital treatment of a securitisation shall be determined on the basis of its economic substance rather than its legal form. The terms used in this section with regard to securitisation are mostly defined in RBI 'Guidelines on Securitisation of Standard Assets'. Some of the additional terms used in the section are defined below:

a) A 'credit enhancing interest only strip (I/Os)' – It is an on-balance sheet asset, which (i) represents a valuation of cash flows related to future margin income to be derived from the underlying exposures, and (ii) is subordinated to the claims of other parties to the transaction in terms of priority of repayment.

b) 'Implicit support' – the support provided by a bank to a securitisation in excess of its predetermined contractual obligation.

c) A 'gain-on-sale' – any profit realised at the time of sale of the securitised assets to SPV.

Operational criteria for Credit Analysis

205. For enabling the transferred assets to be removed from the balance sheet of the originator in a securitisation structure, the isolation of assets or 'true sale' from the originator to the SPV is an essential prerequisite. In case the assets are transferred to the SPV by the originator in full compliance with all the conditions of true sale as given in the extant RBI Guidelines on Securitisation of Standard Assets, the transfer would be treated as a 'true sale' and originator will not be required to maintain any capital against the value of assets so transferred from the date of such transfer.

Implicit Support

206. The originator shall not provide any implicit support to investors in a securitisation transaction.

207. When a bank is deemed to have provided implicit support to a securitisation:

a) It must, at a minimum, hold capital against all of the exposures associated with the securitisation transaction as if they had not been securitised.

b) Additionally, the bank would need to deduct any gain-on-sale (if recorded) from common equity.

c) Furthermore, in respect of securitisation transactions where the bank is deemed to have provided implicit support, it is required to disclose publicly that (i) it has provided non-contractual support, (ii) the details of the implicit support, and (iii) the impact of the implicit support on the bank's regulatory capital.

208. Where a securitisation transaction contains a clean up call and the clean up call can be exercised by the originator in circumstances where exercise of the clean up call effectively provides credit enhancement, the clean up call shall be treated as implicit support and the concerned securitisation transaction will attract the above prescriptions. However, the clean up call up to the extant regulatory permissible limit, if any, may not be treated as credit enhancement.

209. IRB banks are required to hold regulatory capital against all of their securitisation exposures. The other prudential requirements relating to securitisation exposures will be applicable as per the extant RBI guidelines on securitisation.

Internal Ratings-Based (IRB) Approach for Securitisation Exposures

210. *Scope of IRB approach*

i) Banks shall use the Standardised Approach to calculate the credit risk-weighted exposure amounts for its securitisation exposures where it uses the Standardised Approach for the asset sub-class to which the underlying exposures in the securitisation belong.

ii) Banks that have received approval from RBI to use the IRB approach for the type of underlying exposures securitised (e.g. for their corporate or retail portfolio) must use the IRB approach for securitisations. Conversely, banks may not use the IRB approach to securitisation unless they receive approval to use the IRB approach for the underlying exposures from RBI.

iii) If the bank is using the IRB approach for some exposures and the standardised approach for other exposures in the underlying pool, it should generally use the approach corresponding to the predominant share of exposures within the pool. However, in case of doubt, the bank should consult with RBI on which approach to apply to its securitisation exposures, to ensure appropriate capital levels.

iv) Where there is no specific IRB treatment for the underlying asset type, originating banks that have received approval to use the IRB approach must calculate capital charges on their securitisation exposures using the standardised approach in the securitisation framework, and investing banks with approval to use the IRB approach must apply the Rating Based Approach, as detailed below.

Hierarchy of Approaches

211. There are two approaches under the Internal Ratings Based Approach:

a. the Ratings-Based Approach (“RBA”)
b. the Supervisory Formula (“SF”)

212. Under the IRB approach, a bank must follow the hierarchy of approaches to determine the regulatory capital for credit risk in respect of securitisation exposures, as under:

a. The Ratings-Based Approach (RBA) must be applied to securitisation exposures that are externally rated, or where a rating can be inferred as described in paragraph 221.

b. For securitisation exposures where the bank cannot use the RBA, the Supervisory Formula (SF) may be applied (unless the bank cannot use the SF because the bank is unable to reliably determine K_{IRB})

c. Securitization exposures to which none of these approaches can be applied must receive 1111% risk weight.

Maximum capital requirement

213. For a bank using the IRB approach to securitisation, the maximum capital requirement for the securitisation exposures it holds is equal to the IRB capital requirement that would have been assessed against the underlying exposures had they not been securitised and treated under the appropriate sections of the IRB framework.

214. In addition, irrespective of the approach applied, banks must deduct any gain-on-sale (if recorded) and credit enhancing I/Os arising from the securitisation transaction, if not permitted to be recognised, from its common equity.

Ratings-Based Approach (RBA)

215. Under the RBA, the banks shall determine the amount of risk-weighted assets by multiplying the amount of the securitisation exposure (in the case of an off-balance sheet exposure, securitisation exposure will be multiplied with the credit equivalent amount, before applying risk weights) with the appropriate risk weights provided in the tables A and B below.

216. The relevant risk weights under the RBA depend upon:

a. the external credit rating grade or an available inferred rating,

b. whether the credit rating (external or inferred) represents a long-term or a short-term credit rating,

c. the granularity of the underlying pool and

d. the seniority of the securitisation exposure.

217. For the purposes of the RBA, a securitisation exposure is treated as a senior tranche if it is effectively backed or secured by a first claim on the entire amount of the assets in the underlying securitised pool. While this generally includes only the most senior position within a securitisation transaction, in some instances there may be some other claim that, in a technical sense, may be more senior in the waterfall (e.g. a swap claim) but may be disregarded for the purpose of determining which positions are subject to the “senior tranches” column. For example, in a traditional securitisation where all tranches above the first-loss piece are rated, the most highly rated position would be treated as a senior tranche. However, when there are several tranches that share the same rating, only the most senior one in the waterfall would be treated as senior.

218. The risk weights provided in the Table A apply when the external assessment represents a long-term credit rating, as well as when an inferred rating based on a long-term rating is available. Banks may apply the risk weights for senior positions if the effective number of underlying exposures (N as defined in para 229) is 6 or more and the position is senior. When N is less than 6, the risk weights in column 4 of the table A apply. In all other cases, the risk weights in column 3 of the table A apply.

Table A

RBA risk weights when the external assessment represents a long-term credit rating and/or an inferred rating derived from a long-term assessment

External Rating (Illustrative) / Inferred Rating	N* ≥ 6		N < 6
	Risk weights for senior positions**	Base risk weights, i.e. Risk weights for other exposures	Risk weights for tranches backed by non-granular pools
AAA	7%	12%	20%
AA	8%	15%	25%
A+	10%	18%	35%
A	12%	20%	
A-	20%	35%	
BBB+	35%	50%	
BBB	60%	75%	
BBB-	100%		
BB+	250%		
BB	425%		
BB-	650%		
Below BB- and unrated	1111%		

Table B

RBA risk weights when the external assessment represents a short-term credit rating and/or an inferred rating derived from a short-term assessment

External Rating (Illustrative) / Inferred Rating	N ≥ 6		N < 6
	Risk weights for senior positions	Base risk weights, i.e. Risk weights for other exposures	Risk weights for tranches backed by non-granular pools
A-1/P-1	7%	12%	20%
A-2/P-2	12%	20%	35%
A-3/P-3	60%	75%	75%
All other ratings/unrated	1111%	1111%	1111%

* A bank shall calculate the effective number of underlying exposures **(N)** for each securitisation exposure in accordance with paragraph 232.

** a securitisation exposure is treated as a senior tranche if it is effectively backed or secured by a first claim on the entire amount of the assets in the underlying securitised pool. A bank need not consider interest rate or currency swaps when determining whether a securitisation exposure is the most senior in a securitisation for the purpose of applying the RBA.

Operational requirements for use of external credit assessments

219. A bank relying upon credit ratings for risk weighting its securitization exposures under IRB Approaches should meet the requirements specified in paragraph (i) through (ii) below.

(i) A bank should meet the following operational requirements for use of external credit assessments in determination of capital requirements for securitization exposures :

(a) To be eligible for risk-weighting purposes, the external credit assessment must take into account and reflect the entire amount of credit risk exposure the bank has with regard to all payments owed to it. For example, if a bank is owed both principal and interest, the assessment must fully take into account and reflect the credit risk associated with timely repayment of both principal and interest.

(b) The external credit assessments must be from an eligible ECAI as recognised by RBI (in the case of securitization exposures originated by entities outside India the credit assessments must be from the ECAI recognised by the local national supervisors). The rating must be published in an accessible form and included in the ECAI's transition matrix. Consequently, ratings that are made available only to the parties to a transaction do not satisfy this requirement.

(c) Eligible ECAIs must have a demonstrated expertise in assessing securitisations, which may be evidenced by strong market acceptance.

(d) A bank must apply external credit assessments from eligible ECAIs consistently across a given type of securitisation exposure. Furthermore, a bank cannot use the credit assessments issued by one ECAI for one or more tranches and those of another ECAI for other positions (whether retained or purchased) within the same securitisation structure that may or may not be rated by the first ECAI. Where two or more eligible ECAIs can be used and these assess the credit risk of the same securitization exposure differently, guidance given by RBI under Standardised Approach will apply.

(e) Where CRM is provided directly to an SPE by an eligible guarantor and is reflected in the external credit assessment assigned to a securitisation

exposure(s), the risk weight associated with that external credit assessment should be used. In order to avoid any double counting, no additional capital recognition is permitted. If the CRM provider is not recognised as an eligible guarantor the covered securitisation exposures should be treated as unrated.

(f) In the situation where a credit risk mitigant is not obtained by the SPE but rather applied to a specific securitisation exposure within a given structure (e.g. ABS tranche), the bank must treat the exposure as if it is unrated and then use the CRM treatment to recognise the hedge.

(ii) The bank must perform proper due diligence of securitization exposures based on the information specified in paragraphs (a) through (c) below on the underlying collateral supporting securitisation exposures' and any other information the bank may consider necessary in this regard:

(a) As a general rule, a bank must, on an ongoing basis, have a comprehensive understanding of the risk characteristics of its individual securitisation exposures, whether on balance sheet or off balance sheet, as well as the risk characteristics of the pools underlying its securitisation exposures.

(b) Banks must be able to access performance information on the underlying pools on an ongoing basis in a timely manner. Such information may broadly include, as appropriate: exposure type; percentage of loans 30, 60 and 90 days past due; default rates; prepayment rates; loans in foreclosure; property type; occupancy; average credit score or other measures of creditworthiness; average loan-to-value ratio; and industry and geographic diversification.

(c) A bank must have a thorough understanding of all structural features of a securitisation transaction that would materially impact the performance of the bank's exposures to the transaction, such as the contractual waterfall and waterfall-related triggers, credit enhancements, liquidity enhancements, market value triggers, and deal-specific definitions of default.

220. A bank is not permitted to use any external credit assessment for risk weighting purposes where the assessment is at least partly based on unfunded support provided by the bank. For example, if a bank buys an ABS/MBS where it provides an unfunded securitisation exposure extended to the securitisation (e.g. liquidity facility or credit enhancement), and that exposure plays a role in determining the credit assessment on the securitised assets/various tranches of the ABS/MBS, the bank must treat the securitised assets/various tranches of the ABS/MBS as if these were not rated.

Use of Inferred Ratings

221. Banks may attribute an inferred rating to an unrated securitisation exposure if the following requirements are complied with:

(a) If there is a securitisation exposure which has an external credit assessment by a recognised ECAI (the "reference securitisation exposure") and which is subordinate in all respects to the unrated securitisation exposure. Credit enhancements, if any, must be taken into account when assessing the relative subordination of the unrated exposure and the reference securitisation exposure. For example, if the reference securitisation exposure benefits from any third-party guarantees or other credit enhancements that are not available to the unrated exposure, then the latter may not be assigned an inferred rating based on the reference securitisation exposure.

(b) The maturity of the reference securitisation exposure is equal to or longer than that of the unrated securitisation exposure; and

(c) The bank has an established internal process to ensure that any inferred rating will be updated immediately to reflect any changes in the external credit assessment of the reference securitisation exposure.

(d) The external rating of the reference securitization exposure must satisfy the operational requirements for its use.

Supervisory Formula (SF)

222. Under the SF, the regulatory capital for credit risk in respect of a securitisation exposure depends upon the following bank-supplied inputs:

(a) the IRB capital requirement had the pool not been securitised ($\mathbf{K_{IRB}}$);

(b) the credit enhancement level (**L**);

(c) the thickness (**T**);

(d) the effective number of exposures in the pool **(N)**; and

(e) the pool's exposure-weighted average loss given default (**LGD**).

Definition of K_{IRB}

223. K_{IRB} is the ratio (in decimal form) of:

(a) the IRB capital requirement, including the expected loss (EL) portion, for the pool; to

(b) the exposure amount of the pool, i.e. the sum of drawn amounts plus the estimated exposure at default of undrawn commitments.

The amount in (a) above must be calculated in accordance with the applicable minimum IRB standards as if the exposures in the pool were held directly by the bank. This calculation may reflect the effects of any CRM that is applied on the underlying exposures in the pool (either individually or to the entire pool), and hence benefits all of the securitisation exposures. For structures involving an SPV/SPE, all the assets of the SPV/SPE that are related to the securitisation must be treated as exposures in the pool, including assets in which the SPV may have invested a reserve account, such as a cash collateral account.

Definition of the credit enhancement level (L)

224. Credit enhancement level (**L**) is measured as the ratio (in decimal form) of:

(a) the outstanding amount of all securitisation exposures subordinate to the tranche in question; to

(b) the amount of exposures in the pool

225. Banks must determine L before considering the effects of any tranche-specific credit enhancements that benefit only a single tranche. Any gain on sale and/or credit enhancing I/Os associated with the securitisation must not be included in the measurement of L. The size of interest rate or currency swaps that are more junior than the tranche may be measured at their current mark-to-market value (i.e. excluding the amount estimated for potential future exposure) when calculating L. If the mark-to-market value cannot be measured, the derivative instrument must be ignored in the calculation of L.

226. Unfunded reserve accounts must not be included in the calculation of L if they are to be funded from future receipts from the underlying exposures. If there is any reserve account that has already been funded by accumulated cash flows from the underlying exposures that is more junior than the tranche in question, it may be included in the calculation of L.

Definition of the thickness of exposure (T)

227. Thickness of exposure (**T**) is measured as the ratio (in decimal form) of:

(a) the nominal size of the securitisation exposure or tranche; to

(b) the notional amount of the exposures in the pool. (may be the same amount as the denominators of K_{IRB} and L)

228. Where an exposure arises from an interest rate or currency swap, the bank must incorporate the potential future exposure of the swap in the measurement of the nominal size of the securitisation exposure. If the mark-to-market value of the derivative instrument is positive, the exposure size must be measured by the current exposure method. If the mark-to-market value of the derivative instrument is negative, the exposure must be measured by using the potential future exposure only.

Definition of the effective number of exposures (N)

229. Effective number of exposures (N) is calculated as:

$$N = \frac{\left(\sum_i EADi\right)^2}{\sum_i EAD_i^{\,2}}$$

where exposure at default (EAD_i) represents the exposure at default associated with the i^{th} exposure in the pool. Multiple exposures to the same obligor must be consolidated when calculating the effective number of exposures. If the portfolio share associated with the largest exposure ($\mathbf{C_1}$) is available, the bank may compute N as $1/C_1$.

Definition of the exposure-weighted average loss given default (LGD)

230. The exposure-weighted average LGD is calculated as follows:

$$LGD = \frac{\sum_i LGD_i * EAD_i}{\sum_i EAD_i}$$

where LGD_i represents the average LGD associated with all exposures to the i^{th} borrower. When default and dilution risks for purchased receivables are treated in an aggregate manner (e.g. a single reserve or over-collateralisation is available to cover losses from either source) within a securitisation, the LGD input must be constructed as a weighted average of the LGD for default risk and 100 per cent LGD for dilution risk. The weights to be used in this calculation are the stand-alone IRB risk-weights for default risk and dilution risk, respectively.

Capital charge under the supervisory formula

231. The capital charge under the SF is calculated as the value of exposures that have been securitised multiplied by the greater of:

(a) 0.0056 × T; and

(b) (S [L+T] – S [L])

where the function S[.] (the supervisory formula) is defined below. When the bank holds only a proportional interest in the tranche, that position's capital charge equals the prorated share of the capital charge for the entire tranche. The supervisory formula is given by the following expression:

$S[L] = L,$ when $L \leq K_{IRB}$

$S[L] = K_{IRB} + K[L] - K[K_{IRB}] + (d * K_{IRB} / \omega)\left(1 - e^{\omega(K_{IRB} - L)/K_{IRB}}\right)$, when $K_{IRB} < L$

Where

$$h = \left(1 - \frac{K_{IRB}}{LGD}\right)^N$$

$$c = \frac{K_{IRB}}{1-h}$$

$$v = \frac{(LGD - K_{IRB})K_{IRB} + 0.25(1 - LGD)K_{IRB}}{N}$$

$$f = \left(\frac{v + K_{IRB}^{\ 2}}{1-h} - c^2 \right) + \frac{(1-K_{IRB})K_{IRB} - v}{(1-h)\tau}$$

$$g = \frac{(1-c)c}{f} - 1$$

*a= g*c*

b= g(1-c)*

$$d = 1 - (1-h) * \left(1 - Beta\left[K_{IRB}; a, b\right]\right)$$

$$K\left[L\right] = (1-h) * \left(\left(1 - Beta\left[L; a, b\right]\right)L + Beta\left[L; a+1, b\right]c\right)$$

In the above equations, Beta(L;a,b) refers to the cumulative beta distribution with parameters a and b and evaluated at L. Banks may consider the following values for using in the above equations ω= 20, τ= 1000

232. Risk-weighted asset amounts generated through the use of the SF are calculated by multiplying the capital requirement as determined above by 12.5. If the risk-weight resulting from the SF is 1111% of the exposure value or greater, the bank must deduct the securitisation exposure from its common equity. In the case where a bank has set aside a specific provision or has a non refundable purchase price discount on an exposure in the pool, K_{IRB} and L must be calculated using the gross amount of the exposure, without taking into account the specific provision and/or non-refundable purchase price discount. In this case, the amount of the non-refundable purchase price discount on a defaulted asset or the specific provision can be used to reduce the amount of any deduction from capital associated with the securitisation exposure.

Simplified method for computing the effective number of exposures (N) and the exposure-weighted average loss given default (LGD)

233. Subject to approval from RBI, a bank that has a securitisation involving retail exposures may use a simplified method for calculating (N) and (LGD) whereby the SF may be implemented using the simplifications *h = 0* and *v = 0*

234. Under the simplified method, if the portfolio share associated with the largest exposure (C_1) is no more than three per cent (i.e. a value of .03) of the underlying

pool, for purposes of the SF a bank may set LGD equal to 50 per cent (0.5) and N equal to the following amount:

$$N = \left[C_1 * C_m + \left(\frac{C_m - C_1}{m-1} \right) * \max\{1 - mC_1, 0\} \right]^{-1}$$

where $\mathbf{C_m}$ denotes the share of the securitised asset pool corresponding to the sum of the largest **m** exposures. The level of m is decided by the bank. Alternatively, if only C_1 is available and this amount is no more than three per cent, then the bank may set LGD equal to 50 per cent (i.e. 0.5) and N=1/ C_1.

Securitisation - Liquidity facilities

235. Under the IRB Approach, liquidity facilities are treated as any other securitisation exposure and receive a CCF of 100%. If the facility is externally rated, the bank may rely on the external rating and use the RBA risk weights. Thus, the notional amount of the securitisation exposure must be assigned the risk weight in the RBA appropriate to the credit rating equivalent assigned to the bank's exposure. If the facility is not rated (which is generally the case), the bank may use the inferred rating, if applicable, or may apply the SFA. If neither approach can be used, then the facility must be deducted risk weighted at 1111%.

Eligible liquidity facilities

236. Banks are permitted to treat off-balance sheet securitisation exposures as eligible liquidity facilities if the following minimum requirements are satisfied:

(a) The facility documentation must clearly identify and limit the circumstances under which it may be drawn. Draws under the facility must be limited to the amount that is likely to be repaid fully from the liquidation of the underlying exposures and any seller-provided credit enhancements. In addition, the facility must not cover any losses incurred in the underlying pool of exposures prior to a draw, or be structured such that draw-down is certain (as indicated by regular or continuous draws);

(b) The facility must be subject to an asset quality test that precludes it from being drawn to cover credit risk exposures that are in default. In addition, if the exposures that a liquidity facility is required to fund are externally rated securities, the facility

can only be used to fund securities that are externally rated investment grade at the time of funding;

(c) The facility cannot be drawn after all applicable credit enhancements from which the liquidity would benefit have been exhausted; and

(d) Repayment of draws on the facility (i.e. assets acquired under a purchase agreement or loans made under a lending agreement) must not be subordinated to any interests of any note holder or subject to deferral or waiver.

237. When it is not practical for the bank to use either the bottom-up approach or the top-down approach for calculating K_{IRB}, the bank may, on an exceptional basis and subject to RBI's consent, temporarily be allowed to apply the following method. If the liquidity facility is an eligible liquidity facility as defined above, the highest risk weight assigned under the Standardised approach to any of the underlying individual exposures covered by the liquidity facility can be applied to the entire liquidity facility. If the liquidity is an eligible liquidity facility as defined above, the CCF must be 100%. In all other cases, the notional amount of the liquidity facility must be deducted from common equity.

Treatment of overlapping exposures

238. A bank may provide several types of facilities that can be drawn under various conditions. The same bank may be providing two or more of these facilities. Given the different triggers found in these facilities, it may be the case that a bank provides duplicative coverage to the underlying exposures. In other words, the facilities provided by a bank may overlap since a draw on one facility may preclude (in part) a draw under the other facility. In the case of overlapping facilities provided by the same bank, the bank does not need to hold additional capital for the overlap. Rather, it is only required to hold capital once for the position covered by the overlapping facilities (whether they are liquidity facilities or credit enhancements). Where the overlapping facilities are subject to different conversion factors, the bank must attribute the overlapping part to the facility with the highest conversion factor. However, if overlapping facilities are provided by different banks, each bank must hold capital for the maximum amount of the facility.

Eligible servicer cash advance facilities

239. If contractually provided for, servicers may advance cash to ensure an uninterrupted flow of payments to investors so long as the servicer is entitled to full reimbursement and this right is senior to other claims on cash flows from the underlying pool of exposures. Such undrawn servicer cash advances or facilities that are unconditionally cancellable without prior notice may be eligible for a 0% CCF.

Treatment of credit risk mitigation for securitisation exposures

240. As with the RBA, banks are required to apply the CRM techniques as specified in the foundation IRB approach when applying the SF. The bank may reduce the capital charge proportionally when the credit risk mitigant covers first losses or losses on a proportional basis. For all other cases, the bank must assume that the credit risk mitigant covers the most senior portion of the securitisation exposure (i.e. that the most junior portion of the securitisation exposure is uncovered).

Off-balance sheet exposures and securitisation risk

241. Banks' use of securitisation has grown dramatically over the last several years. It has been used as an alternative source of funding and as a mechanism to transfer risk to investors. While the risks associated with securitisation are not new to banks, the recent financial turmoil highlighted unexpected aspects of credit risk, concentration risk, market risk, liquidity risk, legal risk and reputational risk, which banks failed to adequately address. For instance, a number of banks that were not contractually obligated to support sponsored securitisation structures were unwilling to allow those structures to fail due to concerns about reputational risk and future access to capital markets. The support of these structures exposed the banks to additional and unexpected credit, market and liquidity risk as they brought assets onto their balance sheets, which put significant pressure on their financial profile and capital ratios.

242. Weaknesses in banks' risk management of securitisation and off-balance sheet exposures resulted in large unexpected losses during the financial crisis. To help mitigate these risks, a bank's on- and off-balance sheet securitisation activities

should be included in its risk management disciplines, such as product approval, risk concentration limits, and estimates of market, credit and operational risk

243. In light of the wide range of risks arising from securitisation activities, which can be compounded by rapid innovation in securitisation techniques and instruments, minimum capital requirements calculated under Pillar 1 are often insufficient. All risks arising from securitisation, particularly those that are not fully captured under Pillar 1, should be addressed in a bank's ICAAP. These risks include:

- Credit, market, liquidity and reputational risk of each exposure;
- Potential delinquencies and losses on the underlying securitised exposures;
- Exposures from credit lines or liquidity facilities to special purpose entities; and

244. Securitisation exposures should be included in the bank's MIS to help ensure that senior management understands the implications of such exposures for liquidity, earnings, risk concentration and capital. More specifically, a bank should have the necessary processes in place to capture in timely manner updated information on securitisation transactions including market data, if available, and updated performance data from the securitisation trustee or servicer.

Section F

Supervisory Review Process under Pillar 2 Framework

245. A bank should ensure that it has sufficient capital to meet the Pillar 1 requirements and the results of the credit risk stress test as mentioned in para 56-57 of the Appendix 1. RBI may review the method and the results of the stress test thus carried out under Supervisory Review and Evaluation Process (SREP) under Pillar 2 and may require the bank to reduce risk and/or to hold additional capital/provisions.

246. In addition, residual risks arising out of use of CRM techniques may be reviewed by the bank under Pillar 2.

Section G

Application process for IRB approval

247. Initially, banks need to submit a letter of intention to RBI (on or after April 1, 2012). Along with the letter of intention, the banks must also submit their Board's approval for the application of adoption of IRB approach for credit risk. Banks should also do a self-assessment with reference to these guidelines to check whether they fulfil the criteria mentioned in the guidelines. A gist of the self assessment exercise should also be submitted to RBI along with the letter of intention. This self assessment exercise will broadly cover the following aspects:

- IRB rating system should separately reflect PD (borrower wise) and LGD (facility wise).
- IRB rating system and resultant risk estimates (PD, LGD, EAD and M) must meaningfully assess and differentiate risk.
- IRB rating and risk estimates must be based on current and relevant information. PD and LGD estimates must be reviewed periodically (at least annually).
- IRB rating and risk estimates must be conceptually sound irrespective of the type and complexity of the models used.
- Long term average PD and default weighted average LGD or downturn LGD (whichever is higher) and EAD should be considered.
- Risk estimates/rating system may be grounded on past experience and also give proper emphasis on empirical evidence.
- Risk estimates/rating system should also be forward looking and should meet the minimum data requirement as prescribed in the guidelines.
- Banks must ensure that the default definition used are as per the instructions given in the guideline and should be using this definition consistently across the organisation.
- Banks must have a very robust validation methodology for the rating system/risk estimates. This validation process should be well documented. Operational integrity and consistency of rating system/risk estimates should be given due importance in the validation process.

- Banks should have sound model risk policy with detailed documentation of the model and related system development, validation and control process. This should also have the provision to discuss the limitations of the model as well as applicability of data used to build up the model.

- The Board and the senior management of banks should take the ultimate responsibility of the risk rating system and risk estimates that will be used by the bank for capital calculation. The bank should be able to demonstrate to RBI that the Board and the senior management have good general understanding of the risk rating process, risk estimates and the limitations of the same.

- People responsible for development/buying, implementation and ongoing usage of rating system/model should be separate from the people originating the loans.

- An independent internal audit unit must verify development/buying, implementation and validation of models (whether the process mentioned in model risk policy are being adhered to) at least annually.

- All matters related to IRB risk rating system should be clearly documented and this should be updated on a regular basis to reflect any material change in the system. The document should also be in line with the current practices of the bank. Responsibilities of the persons attached to performance of IRB rating system should be clearly defined and documented as well.

- The bank must ensure that the risk rating system and the risk estimates derived are meaningfully used for its day to day risk management process as per the guideline. The bank must also satisfy itself that the experience and data requirement as given in the guideline with reference to usage of risk rating system is also fulfilled.

- Banks must have in place an adequate and robust data capture, storage and management system with adequate scope, detail, consistency and reliability which will support the IRB rating system and risk components estimation.

248. After receiving letter of intention and the gist of self assessment exercise from a bank, RBI will examine the same and may allow it to submit a detailed application, depending on its primary assessment of the applicant bank. The following information may be required to be provided as part of the detailed application:

a. Cover letter requesting approval;

b. Copy of the Board Resolution approving submission of final application for migrating to IRB;

c. Detailed application format duly filled in (will be given to the banks after RBI is satisfied with initial assessment of the banks' preparedness);

d. Confirmation from the respective heads responsible for risk management and internal audit towards the bank's compliance to IRB requirements;

e. Documentation of planned credit risk measurement systems (including rating systems and models to be used);

f. Control environment of the credit risk measurement system, implementation procedures, and IT infrastructure;

g. Submission of an acceptable third party data management sign off in respect of IRB portfolio;

h. Implementation plan (including roll-out); and

i. Any other information needed by RBI for the assessment.

249. All these documents will be scrutinised by the RBI and detailed assessment of the bank's risk rating system will be carried out in the light of the requirements set in the guideline. RBI may examine the parallel run and its reports alongside examination of the documents submitted by the banks and observe the processes being followed by them during the parallel run period. After a minimum of 18 months parallel run, if RBI is satisfied by the performance of the bank in terms of its adherence to the IRB guidelines, RBI will give the its approval to the banks to adopt IRB approach for capital calculation of credit risk. However, if subsequently at any point of time RBI observes that a bank has deviated from IRB requirements, it may withdraw the approval previously given.

Appendix 1

Minimum requirements for adoption of IRB approaches

1. This section states the minimum requirements for entry and on-going use of the IRB approach. The minimum requirements are set out in 11 separate sub-sections concerning:
(A) composition of minimum requirements, (B) compliance with minimum requirements, (C) rating system design, (D) risk rating system operations, (E) corporate governance and oversight, (F) use of internal ratings, (G) risk quantification, (H) validation of internal estimates, (I) requirements for recognition of leasing, (J) eligibility criteria for calculation of capital charges for equity exposures under internal model method, and (K) disclosure requirements. It may be helpful to note that the minimum requirements cut across asset classes. Therefore, more than one asset classes may be discussed within the context of a given minimum requirement.

(A) Composition of minimum requirements

2. To be eligible for the IRB approach, a bank must demonstrate to RBI that it meets certain minimum requirements at the outset and on an ongoing basis. Many of these requirements are in the form of objectives that a qualifying bank's risk rating systems must fulfil. The focus is on banks' abilities to quantify risk in a consistent, reliable and valid fashion.

3. The overarching principle behind these requirements is that rating and risk estimation systems and processes provide for a meaningful assessment of borrower and transaction characteristics; a meaningful differentiation of risk; and reasonably accurate and consistent quantitative estimates of risk. Furthermore, the systems and processes must be consistent with internal use of these estimates.

4. The minimum requirements set out in this document apply to all asset classes as also to foundation and advanced IRB approaches unless noted otherwise. The

standards related to the process of assigning exposures to borrower or facility *grades* (and the related oversight, validation, etc.) apply equally to the process of assigning retail exposures to pools of homogenous exposures, unless noted otherwise.

5. Generally, all IRB banks must produce their own estimates of PD (banks are not required to produce their own estimates of PD for certain equity exposures under some specified methodologies and certain exposures that fall within the Specialised Lending sub asset class.) and must adhere to the overall requirements for rating system design, operations, controls, and corporate governance, as well as the requisite requirements for estimation and validation of PD measures. Banks wishing to use their own estimates of LGD and EAD must also meet the incremental minimum requirements for these risk factors included in this guideline. IRB risk estimates must include a margin of conservatism. Where the estimation method and the data are less satisfactory and the likely range of errors is larger, the margin of conservatism should also be larger.

(B) Compliance with minimum requirements

6. To be eligible for an IRB approach, a bank must demonstrate to RBI that it meets the IRB requirements, at the outset and on an ongoing basis. There may be circumstances when a bank is not in complete compliance with all the minimum requirements. Where this is the case, the bank must produce a plan for a timely return to compliance, and seek approval from the RBI, or the bank must demonstrate that the effect of such non-compliance is immaterial in terms of the risk posed to the institution. Failure to produce an acceptable plan or to demonstrate immateriality will lead RBI to reconsider the bank's eligibility for the IRB approach. Furthermore, for the duration of any non-compliance, RBI may consider the bank to compute capital under standardised approach. In addition, as per the assessment, the bank may also be required to hold additional capital under Pillar 2.

(C) Rating system design

7. The term “rating system” comprises all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates. Within each asset class, a bank may utilise multiple rating methodologies/systems. For example, a bank may have customised rating systems for specific industries or market segments (e.g. mid corporate and large corporate). If a bank chooses to use multiple systems, the rationale for assigning a borrower to a particular rating system must be documented and applied in a manner that best reflects the level of risk of the borrower. Banks must not allocate borrowers across rating systems inappropriately to minimise regulatory capital requirements (i.e. cherry-picking by choice of rating system). Banks must demonstrate that each system used for IRB purposes is in compliance with the minimum requirements at the outset and on an ongoing basis.

Rating dimensions

Standard for corporate, sovereign and bank exposures

8. A qualifying IRB rating system must have two separate and distinct dimensions: (i) the risk of borrower default, and (ii) transaction-specific factors.

9. The first dimension (borrower grade and must solely reflect PD) must be oriented to the risk of borrower default. Separate exposures to the same borrower must be assigned to the same borrower grade, irrespective of any differences in the nature of each specific transaction. There are two exceptions to this. Firstly, in the case of country transfer risk, where a bank may assign different borrower grades depending on whether the facility is denominated in local or foreign currency and secondly, when the treatment of associated guarantees to a facility may be reflected in an adjusted borrower grade. A bank must articulate in its credit policy the relationship between borrower grades in terms of the level of risk each grade implies. Perceived and measured risk must increase as credit quality declines from one grade to the next. The policy must articulate the risk of each grade in terms of both a

description of the probability of default risk typical for borrowers assigned the grade and the criteria used to distinguish that level of credit risk.

10. The second dimension (facility grade and should solely express LGD) must reflect transaction-specific factors, such as collateral, seniority, product type, etc. But as an exception for F-IRB banks, this requirement can also be fulfilled by the existence of a facility dimension, which reflects both borrower (to the extent that PD may be related with LGD) and transaction-specific factors. For example, a rating dimension that reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations would also qualify besides a rating system that exclusively reflects LGD. Where a rating dimension reflects EL and does not separately quantify LGD, the supervisory estimates of LGD must be used.

11. For banks using the advanced IRB approach, facility ratings must exclusively reflect LGD. These ratings can reflect any and all factors that can influence LGD including, but not limited to, the type of collateral, product, industry, and purpose. Borrower characteristics may be included as LGD rating criteria only to the extent they are predictive of LGD. Banks may alter the factors that influence facility grades across segments of the portfolio as long as they can satisfy RBI that it improves the relevance and precision of their estimates.

12. Banks using the supervisory slotting criteria for the SL sub-class are exempt from this two-dimensional requirement for these exposures. Given the interdependence between borrower/transaction characteristics in SL, banks may satisfy the requirements under this heading through a single rating dimension that reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations. This exemption does not apply to banks using either the corporate foundation or advanced IRB approach for the SL sub-class.

Standards for retail exposures

13. Rating systems for retail exposures must capture all relevant borrower and transaction characteristics. Banks must assign each exposure that falls within the definition of retail for IRB purposes into a particular pool. Banks must demonstrate that this process provides for a meaningful differentiation of risk, provides for a

pooling of sufficiently homogenous exposures with similar risk characteristics for purposes of risk assessment and quantification, and allows for accurate and consistent estimation of loss characteristics at pool level.

14. For each pool, banks must estimate PD, LGD, and EAD. Some of the indicative risk drivers when assigning exposures to a pool, are given below:

- Borrower risk characteristics (e.g. borrower type, demographics such as age/occupation);
- Transaction risk characteristics, including product and/or collateral types [e.g. loan to value measures, seasoning, guarantees; and seniority (first vs. second lien)]. Banks must explicitly address cross-collateral provisions where present;
- Banks are expected to separately identify exposures that are delinquent and those that are not.

Rating structure

Standards for corporate, sovereign, and bank exposures

15. A bank must have a meaningful distribution of exposures across grades with no excessive concentrations, on both its borrower-rating and its facility-rating scales. To meet this objective, a bank must have a minimum of seven borrower grades for non-defaulted borrowers and one for those that have defaulted. Banks with lending activities focused on a particular market segment may satisfy this requirement with the minimum number of grades. However, RBI may require banks, which lend to borrowers of diverse credit quality, to have a greater number of borrower grades on a case to case basis.

16. A borrower grade is defined as an assessment of borrower risk on the basis of a specified and distinct set of rating criteria, from which estimates of PD are derived. The grade definition must include 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. Furthermore, “+” or “-” modifiers to alpha or numeric grades will only qualify as distinct grades if the bank has developed complete rating descriptions and criteria for their assignment, and separately quantifies PDs for these modified grades.

17. In case of banks with loan portfolios concentrated in a particular market segment, range of default risk must have enough grades to avoid undue concentrations of borrowers in a particular grade. Significant concentrations within a single grade or grades must be supported by convincing empirical evidence that the grade or grades cover reasonably narrow PD bands and that the default risk posed by all borrowers in a grade fall within that band.

18. There is no specific minimum number of facility grades for banks using the advanced approach for estimating LGD. A bank must have a sufficient number of facility grades to avoid grouping facilities with widely varying LGDs into a single grade. The criteria used to define facility grades must be grounded in empirical evidence.

19. Banks using the supervisory slotting criteria for the SL asset classes must have at least four grades for non-defaulted borrowers, and one for defaulted borrowers. The requirements for SL exposures that qualify for the corporate foundation and advanced approaches are the same as those for general corporate exposures.

Standards for retail exposures

20. For each pool identified, the bank must be able to provide quantitative measures of loss characteristics (PD, LGD, and EAD) for that pool. The level of differentiation for IRB purposes must ensure that the number of exposures in a given pool is sufficient so as to allow for meaningful quantification and validation of the loss characteristics at the pool level. There must be a meaningful distribution of borrowers and exposures across pools. A single pool must not include an undue concentration of the bank's total retail exposure.

Rating criteria

21. A bank's internal risk rating policy for its exposures must document the bank's rating philosophy which determines how the borrower rating is affected by bank's assumptions on economic, business and specific industry conditions. This is important as it determines frequency of borrower rating changes in changing

economic scenarios depending on whether the bank is using point-in-time or through-the-cycle approach. Many banks will also use a rating system which is a combination of point-in-time and through-the-cycle approach and the bank must estimate the effect of rating migration on its capital requirement at all phases of economic cycle. Further, a bank must document specific rating definitions, processes and criteria for assigning exposures to grades within a rating system. The rating definitions and criteria must be both plausible and intuitive and must result in a meaningful differentiation of risk. The internal rating policy should also ideally be having the following features:

- The grade descriptions and criteria must be sufficiently detailed to allow those charged with assigning ratings to consistently assign the same grade to borrowers or facilities posing similar risk. This consistency should exist throughout the bank. If rating criteria and procedures differ for different types of borrowers or facilities, the bank must monitor for possible inconsistency, and must alter rating criteria to improve consistency when appropriate.

- Written rating definitions must be clear and detailed enough to allow third parties to understand the assignment of ratings, such as internal audit or an equally independent function and RBI, to replicate rating assignments and evaluate the appropriateness of the grade/pool assignments.

- The criteria must also be consistent with the bank's internal lending standards and its policies for handling troubled borrowers and facilities.

22. To ensure that banks are consistently taking into account available information, they must use all relevant and material information in assigning ratings to borrowers and facilities. Information must be current. The less information a bank has, the more conservative must be its assignments of exposures to borrower and facility grades or pools. An external rating can be the primary factor determining an internal rating assignment; however, the bank must ensure that it considers other relevant information.

SL product lines within the corporate asset class

23. Banks using the supervisory slotting criteria for SL exposures must assign exposures to their internal rating grades based on their own criteria, systems and processes, subject to compliance with the requisite minimum requirements. Banks must then map these internal rating grades into the five (including default category)

supervisory rating categories. Tables 1 to 4 in Appendix 9 provide, for each sub-class of SL exposures, the general assessment factors and characteristics exhibited by the exposures that fall under each of the supervisory categories. Each lending activity has a unique table describing the assessment factors and characteristics.

24. It may so happen that the criteria that banks use to assign exposures to internal grades will not perfectly align with criteria that define the supervisory categories in case of SL exposures; however, banks must demonstrate that their mapping process has resulted in an alignment of grades which is consistent with the preponderance of the characteristics in the respective supervisory category. Banks should take special care to ensure that any overrides of their internal criteria do not render the mapping process ineffective.

Rating assignment horizon

25. Although the time horizon used in PD estimation is one year, banks are expected to use a longer time horizon in assigning ratings.

26. A borrower rating must represent the bank's assessment of the borrower's ability and willingness to contractually perform despite adverse economic conditions or the occurrence of unexpected events. For example, a bank may base rating assignments on specific, appropriate stress scenarios. Alternatively, a bank may take into account borrower characteristics that are reflective of the borrower's vulnerability to adverse economic conditions or unexpected events, without explicitly specifying a stress scenario. The range of economic conditions that are considered when making assessments must be consistent with current conditions and those that are likely to occur over a business cycle within the respective industry/geographic region.

27. Given the difficulties in forecasting future events and the influence they will have on a particular borrower's financial condition, a bank must take a conservative view of projected information. Furthermore, where limited data are available, a bank must adopt a conservative bias to its analysis.

Use of models

28. The following requirements are applicable to statistical models and other mechanical method used to assign obligor or exposure rating or to estimate PD, LGD or EAD. Sufficient human judgement and human oversight is necessary to ensure that all relevant and material information including those which are outside the scope of the models are also taken into consideration (so that the model results may be supplemented) and that the model are used appropriately.

29. The responsibility is on the bank to satisfy RBI that a model or the procedure used has good predictive power and that regulatory capital requirements will not be distorted as a result of its use. The variables that are input to the model must form a reasonable set of predictors. The model must be accurate on average across the range of obligors or exposures to which the bank is exposed to and there must not be any material bias. Also, use of a model bought from a third party vendor that claims proprietary technology is not a justification for exemption from documentation or any other requirements for internal rating system.

30. The bank must have in place a process for vetting data inputs into a statistical default or loss prediction model which includes an assessment of the accuracy, completeness and appropriateness of the data specific to the assignment of the approved rating. Bank must be able to demonstrate that the data used to build the models are representative of the population of the bank's existing obligors or exposures.

31. When combining model results with human judgement, the judgement must take into account all relevant and material information not considered by the model. The bank must have written, well documented guidance describing how human judgement and model results are to be combined. The bank must have procedures for human review of model based rating assignments. Such procedures should focus on finding and limiting errors associated with known model weaknesses and must also include credible ongoing efforts to improve the model's performance.

32. The bank must have a regular cycle of model validation that includes monitoring of model performance and stability; review of model relationship; and testing of model outputs against outcomes.

33. Models purchased from vendors may be having sophisticated techniques embedded in it. However, whether the methods on which a model is based are simple or complex, it is important that users be able to acquire very good understanding of those methods in order to evaluate the suitability of the model for specific business applications under consideration. In this regard, clear documentation and description of the methods are essential.

34. Although users should be expected to perform appropriate testing of a model before deciding to use it, review of documentation provided by the vendor also typically forms part of the decision process for acceptance of the model. Vendor documentation varies considerably in the level of detail provided about key elements, such as the nature of the reference data used for model development and the results of validation. However, it should be kept in mind that vendors are understandably reluctant to include in their documentation any information that might reflect unfavourably on the product; as a result, it is difficult to regard vendor documentation as unbiased. So it is the responsibility of the bank to verify “suitability and appropriateness” of the model in all respects in relation to its business at the time of adopting the model.

35. Many models are developed from data with limited geographic coverage. It is possible that as a result of the location of the primary vendors or data availability, some models are developed on data sets that primarily or exclusively reflect other jurisdictions’ data. Developmental or reference samples also often are skewed toward larger obligors or publicly traded obligors, either by design or because those are the only data available to the vendor at reasonable cost. Certain types of obligors, such as financial firms, are routinely excluded from reference data sets by many vendors. However, credit-risk models are most reliable when applied to obligors or exposures that are similar to those used in their development. Banks should proceed more cautiously when attempting to apply a model to obligors or exposures that differ substantially from those in the reference data set for the model.

36. In many cases, there is an element of tension between the natural desire of vendors to protect proprietary elements of models and the needs of model users to have enough information about models to comply with regulatory expectations and principles of sound model use. These tensions likely will always exist to some extent. However, there appear to be a number of areas in which a modest amount of additional disclosure by vendors could significantly enhance the ability of institutions to use credit risk models in ways that conform more closely to supervisory expectations and sound management practices.

37. It is important that users of a model have a clear understanding of the nature of the reference data set and its limitations. Some vendors provide greater levels of detail regarding the composition of the sample along key dimensions. Vendors often have the most comprehensive understanding of the limitations of the data, and therefore are in the best position to assist clients in understanding the relative applicability of the model to different exposures, obligor or lines of business. Vendors may be able to provide guidance on whether there are some situations in which the model should not be applied, or should be applied only with extreme caution. Banks need to keep this in mind and coordinate with the vendors accordingly.

38. It has to be seen specifically whether the definition of default as used in the vendor model is in consonance with the definition of default as mentioned in para 74-80 of this Appendix.

39. Periodical validation of models at the banks' end is very important and as such effective validation will warrant appropriate data from the bank and competence of the banks' staff doing the validation. The staff should have adequately detailed understanding of the model so that they can identify and test all the relevant aspects of the model. Also keeping in mind the proprietary nature of many vendor models, bank staff should coordinate with technically proficient staff of the vendors as those are best equipped to do a thorough and effective validation. As the banks may need to perform customisation on the models supplied by the vendors, it is essential for them to understand which areas of the models can be modified and what are the effects of those modifications. In this regard also the vendors' advice may be very useful for the banks.

40. The RBI has been emphasising the importance of rigorous stress testing to identify and assess risks in banks. Some vendor models may explicitly allow for the creation and evaluation of stress scenarios by users. However, others make stress testing difficult. In some cases, difficulties arise because key inputs or relationships cannot be modified by the user. In other cases, the model requires certain relationships to be maintained between variables, and it may difficult or impossible for the user to assess whether these relationships are being maintained as assumptions associated with a stress scenario are applied to the model. Stress testing using vendor models also confronts a trade-off related to model complexity. Models that include more variables or more complex relationships may lead to a richer and more realistic description of how risk is related to underlying factors. However, such models may also make stress testing more difficult; a larger number of variables require a more elaborate specification of the stress scenario, creating the challenge of ensuring that all key elements of the scenario are internally consistent. Again, because of the necessarily proprietary nature of vendor products, vendors may try not to fully reveal all of the model details that users might find useful for stress testing. However, it is the responsibility of the banks to see to it that proper stress testing may be performed using the model and if possible whether additional helpful disclosure might be possible by the vendor without jeopardising the competitive position and value of the product.

Documentation of rating system design

41. Banks must document in writing their rating systems' design and operational details. The documentation must evidence banks' compliance with the minimum standards, and must address topics such as portfolio differentiation, rating criteria, responsibilities of parties that rate borrowers and facilities, definition of what constitutes a rating exception, parties that have authority to approve exceptions, frequency of rating reviews, and management oversight of the rating process. A bank must document the rationale for its choice of internal rating criteria and must be able to provide analyses demonstrating that rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk. Rating criteria and procedures must be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions. In addition, a bank must document a

history of major changes in the risk rating process, and such documentation must support identification of changes made to the risk rating process subsequent to the last supervisory review by the RBI. The system of rating assignment, including the internal control structure, must also be documented.

42. Banks must document the specific definitions of default and losses used internally and demonstrate consistency with the reference definitions set out in paragraphs 74-81 of this Appendix.

43. If the bank employs statistical models in the rating process, the bank must document their methodologies in addition to complying with the requirements as specified in paras 28 to 40 of this Appendix. This material must:

- Provide a detailed outline of the theory, assumptions and/or mathematical an empirical basis of the assignment of estimates to grades, individual obligors, exposures, or pools, and the data source(s) used to estimate the model;
- Establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and
- Indicate any circumstances under which the model does not work effectively.

(D) Risk rating system operations

Coverage of ratings

44. For corporate, sovereign, and bank exposures, each borrower and all recognised guarantors must be assigned a rating and each exposure must be associated with a facility rating as part of the loan approval process. Similarly, for retail, each exposure must be assigned to a homogeneous pool as part of the loan approval process.

45. Each separate legal entity to which the bank is exposed must be separately rated. A bank must have policies acceptable to the RBI regarding the treatment of individual entities in a connected group including circumstances under which the same rating may or may not be assigned to some or all related entities.

Integrity of rating process

Standards for corporate, sovereign, and bank exposures

46. Rating assignments and periodic rating reviews must be completed or approved by a party that does not directly stand to benefit from the extension of credit. Independence of the rating assignment process can be achieved through a range of practices that will be carefully reviewed by the RBI. These operational processes must be documented in the bank's procedures and incorporated into bank policies. Credit policies and underwriting procedures must reinforce and foster the independence of the rating process.

47. Borrowers and facilities must have their ratings refreshed at least on an annual basis. Certain credits, especially higher risk borrowers or problem exposures, must be subject to more frequent review. In addition, banks must initiate a new rating if material information on the borrower or facility comes to light.

48. The bank must have an effective process to obtain and update relevant and material information on the borrower's financial condition, and on facility characteristics that affect LGDs and EADs (such as the condition of collateral). Upon receipt, the bank needs to have a procedure to update the borrower's rating in a timely fashion.

Standards for retail exposures

49. A bank must review the loss characteristics and delinquency status of each identified risk pool on at least an annual basis. It must also review the status of individual borrowers within each pool as a means of ensuring that exposures continue to be assigned to the correct pool. This requirement may be satisfied by review of a representative sample of exposures in the pool.

Overrides

50. For rating assignments based on expert judgement, banks must clearly articulate the situations in which bank officers may override the outputs of the rating process, including how and to what extent such overrides can be used and by whom.

For model-based ratings, the bank must have guidelines and processes for monitoring cases where human judgement has overridden the model's rating, variables were excluded or inputs were altered. These guidelines must include identifying personnel that are responsible for approving these overrides. Banks must identify overrides and separately track their performance.

Data maintenance

51. A bank must collect and store data on key borrower and facility characteristics of sufficient detail, scope, reliability and consistency to provide effective support to its internal credit risk measurement and management process, to enable itself to meet the other requirements in this document, and to serve as a basis for supervisory reporting to the RBI. These data should be sufficiently detailed to allow retrospective reallocation of borrowers and facilities to grades, for example if increasing sophistication of the internal rating system suggests that finer segregation of portfolios can be achieved then endeavour should be made to that direction. Further, banks are expected to have in place data management policies and procedures consistent with their process validation criteria.

For corporate, sovereign, and bank exposures

52. Banks must maintain rating histories on borrowers and recognised guarantors, including the rating since the borrower/guarantor was assigned an internal grade, the dates the ratings were assigned, the methodology and key data used to derive the rating and the person/model responsible. The identity of borrowers and facilities that default, and the timing and circumstances of such defaults, must be retained. Banks must also retain data on the PDs and realised default rates associated with rating grades and ratings migration in order to track the predictive power of the borrower rating system.

53. Banks using the advanced IRB approach must also collect and store a complete history of data on the LGD and EAD estimates associated with each facility and the key data used to derive the estimate and the person/model responsible. Banks must also collect data on the estimated and realised LGDs and EADs associated with each defaulted facility. Banks that reflect the credit risk mitigating

effects of guarantees/credit derivatives through LGD must retain data on the LGD of the facility before and after evaluation of the effects of the guarantee/credit derivative. Information about the components of loss or recovery for each defaulted exposure must be retained, such as amounts recovered, source of recovery (e.g. collateral, liquidation proceeds and guarantees), time period required for recovery, and administrative costs etc.

54. Banks under the foundation approach which utilise supervisory estimates are encouraged to retain the relevant data (i.e. data on loss and recovery experience for corporate exposures under the foundation approach, data on realised losses for banks using the supervisory slotting criteria for SL) which will help them to switch over to advanced IRB in due course.

For retail exposures

55. Banks must retain data used in the process of allocating exposures to pools, including data on borrower and transaction risk characteristics used either directly or through use of a model, as well as data on delinquency. Banks must also retain data on the estimated PDs, LGDs and EADs, associated with pools of exposures. For defaulted exposures, banks must retain the data on the pools to which the exposure was assigned over the year prior to default and the realised outcomes on LGD and EAD.

Stress tests used in assessment of capital adequacy

56. An IRB bank must have in place sound stress testing processes for use in the assessment of capital adequacy. Stress testing must involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a bank's credit exposures and assessment of the bank's ability to withstand such changes. Examples of scenarios that could be used are (i) economic or industry downturns; (ii) market-risk events; and (iii) liquidity conditions.

57. In addition to the more general tests described above, the bank must perform a credit risk stress test to assess the effect of certain specific conditions on its IRB regulatory capital requirements. The test to be employed would be one chosen by

the bank, subject to RBI review. The test to be employed must be meaningful and reasonably conservative. Individual banks may develop different approaches to undertaking this stress test requirement, depending on their circumstances. For this purpose, the objective is not necessarily to require banks to consider worst-case scenarios. The bank's stress test in this context should, however, consider at least the effect of moderate recession scenarios. In this case, one example might be to use two consecutive quarters of zero growth to assess the effect on the bank's PDs, LGDs and EADs, taking into account on a conservative basis all of the bank's international diversification.

58. Banks using the double default framework must consider as part of their stress testing framework the impact of a deterioration in the credit quality of protection providers, in particular the impact of protection providers falling outside the eligibility criteria due to rating changes. Banks should also consider the impact of the default of one but not both of the obligor and protection provider, and the consequent increase in risk and capital requirements at the time of that default.

59. Whatever method is used, the bank must include a consideration of the following sources of information. First, a bank's own data should allow estimation of the ratings migration of at least some of its exposures. Second, banks should consider information about the impact of smaller deterioration in the credit environment on a bank's ratings, giving some information on the likely effect of bigger, stress circumstances. Third, banks should evaluate evidence of ratings migration in external ratings. This would include the bank broadly matching its buckets to rating categories.

60. RBI, if considered necessary, will issue guidance to Indian banks on how the tests to be used for this purpose should be designed. The results of the stress test may indicate no difference in the capital calculated under the IRB rules described in this section of this Framework if the bank already uses such an approach for its internal rating purposes. Where a bank operates in several markets, it does not need to test for such conditions in all of those markets, but a bank should stress portfolios containing the vast majority of its total exposures.

(E) Corporate governance and oversight

Corporate governance

61. All material aspects of the rating and estimation processes must be approved by the bank's board of directors or a designated committee of the Board. The Board/its designated committee must possess a general understanding of the bank's risk rating system and detailed comprehension of its associated management reports. Senior management must provide notice to the board of directors or a designated committee thereof of material changes or exceptions from established policies that will materially impact the operations of the bank's rating system.

62. Senior management also must have a good understanding of the rating system's design and operation, and must approve material differences between established procedure and actual practice. Management must also ensure, on an ongoing basis, that the rating system is operating properly. Management and staff in the credit control function must meet regularly to discuss the performance of the rating process, areas needing improvement, and the status of efforts to improve previously identified deficiencies.

63. Internal ratings must be an essential part of the reporting to the Board/senior management. Reporting must include risk profile by grade, migration across grades, estimation of the relevant parameters per grade, and comparison of realised default rates (and LGDs and EADs for banks on advanced approaches) against expectations. Reporting frequencies may vary with the significance and type of information and the level of the recipient.

Credit risk control

64. Banks must have independent Credit Risk Control Units (CRCU) or equivalents that are responsible for the design or selection, implementation and performance of their internal rating systems. The unit(s) must be functionally independent from the personnel and management functions responsible for originating exposures. Areas of responsibility must include:

- Testing and monitoring internal grades;

- Production and analysis of summary reports from the bank's rating system, to include historical default data sorted by rating at the time of default and one year prior to default, grade migration analyses, and monitoring of trends in key rating criteria;

- Implementing procedures to verify that rating definitions are consistently applied throughout the bank;

- Reviewing and documenting any changes to the rating process, including the reasons for the changes; and

- Reviewing the rating criteria to evaluate if they remain predictive of risk. Changes to the rating process, criteria or individual rating parameters must be documented and retained for RBI to review.

65. The model construction and validation teams function independent of each other although both these groups may be part of CRCU. A CRCU may thus actively participate in the development, selection, implementation and validation of rating models. It must assume oversight and supervision responsibilities for any models used in the rating process, and ultimate responsibility for the ongoing review and alterations to rating models. However, it should be kept in mind that that the model building and validation team should necessarily be consisting of different individuals. The validation unit must validate the model and document the basis of certifying the model before it is put into use /the results from it are taken into account for the regulatory capital calculation of the bank.

Internal and external audit

66. Internal audit or an equally independent function must review at least annually the bank's rating system and its operations, including the operations of the credit function and the estimation of PDs along with LGDs and EADs where applicable. All applicable minimum requirements should be adhered to for carrying out the independent review. Internal audit must document its findings. Banks may consider their credit risk models' accuracy by external auditors who should ensure inter alia the following:

(i) It should be checked whether internal validation of models is being done satisfactorily and objectively by the CRCU.

(ii). It should be verified whether the internal models used by the bank is sufficient to cover all of the bank's activities and geographical coverage of operations.

(iii) It should also be ensured that data flows and processes associated with risk measurement system are transparent and accessible to both the internal and external auditors and they have access to model's specifications and parameters.

(iv) External auditors must document the validation procedure, tests and reasons if applicable to conclude that the model is valid.

(F) Use of internal ratings

67. Internal ratings and default and loss estimates must play an essential role in the credit approval, risk management, internal capital allocations, and corporate governance functions of banks using the IRB approach. Ratings systems and estimates designed and implemented exclusively for the purpose of qualifying for the IRB approach and used only to provide IRB inputs are not acceptable. It is recognised that banks will not necessarily be using exactly the same estimates for both IRB and all internal purposes. For example, pricing models are likely to use PDs and LGDs relevant to the life of the asset. Where there are such differences, a bank must document them and demonstrate their reasonableness to the RBI.

68. A bank must have a credible track record in the use of internal ratings information. Thus, the bank must demonstrate that it has been using a rating system that was broadly in line with the minimum requirements articulated in this document for at least the three years prior to qualification. A bank using the advanced IRB approach must demonstrate that it has been estimating and employing LGDs and EADs in a manner that is broadly consistent with the minimum requirements for use of own estimates of LGDs and EADs for at least the three years prior to qualification. Improvements to a bank's rating system will not render a bank non-compliant with the three-year requirement.

(G) Risk quantification

Overall requirements for estimation

Structure and intent

69. This section addresses the broad standards for own-estimates of PD, LGD, and EAD. Generally, all banks using the IRB approaches must estimate a PD (with exception in regard to certain equity exposures and specialised lending (SL) asset sub classes) for each internal borrower grade for corporate, sovereign and bank exposures or for each pool in the case of retail exposures.

70. Internal estimates of PD, LGD, and EAD must incorporate all relevant, material and available data, information and methods. A bank may utilise internal data and data from external sources (including pooled data). Where internal or external data is used, the bank must demonstrate that its estimates are representative of long run experience.

71. Estimates must be grounded in historical experience and empirical evidence, and not based purely on subjective or judgmental considerations. Any changes in lending practice or the process for pursuing recoveries over the observation period must be taken into account. A bank's estimates must promptly reflect the implications of technical advances and new data and other information, as it becomes available. Banks must review their estimates on a yearly basis or more frequently.

72. The population of exposures represented in the data used for estimation, and lending standards in use when the data were generated, and other relevant characteristics should be closely matched to or at least comparable with those of the bank's extant exposures and standards. The bank must also demonstrate that economic or market conditions that underlie the data are relevant to current and foreseeable conditions. For estimates of LGD and EAD, banks must take into account the minimum requirements for LGD and EAD calculation as given in the annex and this appendix. The number of exposures in the sample and the data period used for quantification must be sufficient to provide the bank with confidence

in the accuracy and robustness of its estimates. The estimation technique must perform well in out-of-sample tests.

73. In general, estimates of PDs, LGDs, and EADs are likely to involve unpredictable errors. In order to avoid over-optimism, a bank must add to its estimates a margin of conservatism that is related to the likely range of errors. Where methods and data are less satisfactory and the likely range of errors is larger, the margin of conservatism must be larger. RBI may allow some flexibility in application of the required standards for data that are collected prior to the date of implementation of this Framework. However, in such cases banks must demonstrate to the RBI that appropriate adjustments have been made to achieve broad equivalence to the data without such flexibility. Data collected beyond the date of implementation must conform to the minimum standards unless otherwise stated.

Definition of default

74. A default is considered to have occurred when an asset is classified as NPA (Non performing asset) as per extant RBI guideline on Income recognition, Asset classification and provisioning pertaining to advances. Default regarding agricultural loans also will be considered as per the same guideline. As indicated in paragraph 75 below, restructured assets classified as standard assets will be treated as defaulted for the limited purpose of computation of capital under IRB. Restructured assets will thus be given risk weights as applicable to defaulted asset barring the cases where 'hardship' clauses might have been extended to the borrowers, as per the RBI Master Circular on Relief Measures by Banks in Areas affected by Natural Calamities dated July 1, 2011 or with the prior approval from RBI. However, such restructured accounts would be eligible for upgrade to the non defaulted category after observation of 'satisfactory performance' during the period of one year from the date when the first payment of interest or instalment of principal falls due under the terms of restructuring package. This treatment of restructured assets classified as standard assets is from the perspective of capital adequacy and should not be seen as a contradiction of asset classification norms which have implications for provisioning.

75. The banks may also consider an exposure to be in default if it believes that the borrower is unwilling to pay off the existing debt. The elements to be taken as indications of unlikeliness to pay include:

- The bank puts the credit obligation on non-accrued status.
- The bank makes account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure.
- The bank sells the credit obligation at a material credit-related economic loss.
- The bank consents to a distressed restructuring of the credit obligation where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or (where relevant) fees.
- The bank has filed for the debtor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.
- The debtor has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group.

76. For retail exposures, the definition of default can be applied at the level of a particular facility, rather than at the level of the obligor unless total interest and/or principal due from the defaulted borrower exceed 50% of the total retail exposure to the borrower. If total interest and/or principal exceeds 50% of the total retail exposure to a particular borrower than all the exposures to that borrower will be considered to be in default.

77. A bank must record actual defaults on IRB exposure classes using this reference definition. A bank must also use the reference definition for its estimation of PDs, and (where relevant) LGDs and EADs. In arriving at these estimations, a bank may use external data available to it that is not itself consistent with that definition, subject to the requirements set out in paragraph 39 of the Annex of this guideline. However, in such cases, banks must demonstrate to the RBI that appropriate adjustments to the data have been made to achieve broad equivalence

with the reference definition. This same condition would apply to any internal data used up to implementation of this Framework. Internal data (including that pooled by banks) used in such estimates beyond the date of implementation of this Framework must be consistent with the reference definition.

78. If the bank considers that a previously defaulted exposure's status is such that default definition no longer applies, the bank must rate the borrower and estimate LGD as they would for a non-defaulted facility. However, if the definition of default is subsequently triggered, a second default would be deemed to have occurred.

79. A bank must record default in accordance with the IRB definition of default. The definition of default must be consistent across PD, LGD, EAD estimates and also across the bank.

Treatment of overdrafts

80. Authorised overdrafts must be subject to a credit limit set by the bank and brought to the knowledge of the client. Any break of this limit must be monitored; if the account remains 'out of order' (as per extant RBI master circular on Income recognition, asset classification and provisioning pertaining to advances) for more than 90 days, it would be considered as defaulted. Non-authorised overdrafts will be associated with a zero limit for IRB purposes. Thus, days past due commence once any credit is granted to an unauthorised customer; if such credit were not repaid within 90 days, the exposure would be considered in default. Banks must have in place rigorous internal policies for assessing the creditworthiness of customers who are offered overdraft accounts.

Definition of loss for all asset classes

81. The definition of loss used in estimating LGD is economic loss. When measuring economic loss, all relevant factors should be taken into account. This must include material discount effects and material direct and indirect costs associated with collecting on the exposure. Banks must not simply measure the loss recorded in accounting records, although they must be able to compare accounting and economic losses. The bank's own workout and collection expertise significantly

influences their recovery rates and must be reflected in their LGD estimates, but adjustments to estimates for such expertise must be conservative until the bank has sufficient internal empirical evidence of the impact of its expertise.

Requirements specific to PD estimation for retail assets

82. Given the bank-specific basis of assigning exposures to pools, banks must regard internal data as the primary source of information for estimating loss characteristics. Banks are permitted to use external data or statistical models for quantification provided a strong link can be demonstrated between (a) the bank's process of assigning exposures to a pool and the process used by the external data source, and (b) the bank's internal risk profile and the composition of the external data. In all cases, banks must use all relevant and material data sources as points of comparison.

83. Irrespective of whether banks are using external, internal, pooled data sources or a combination of the three, for their estimation of loss characteristics, the length of the underlying historical observation period used must be at least five years. If the available observation spans a longer period for any source, and these data are relevant, this longer period must be used. A bank need not give equal importance to historic data if it can convince the RBI that more recent data are a better predictor of loss rates.

84. It is recognised that seasoning (i.e. ageing) can be quite material for some long-term retail exposures characterised by seasoning effects that peak several years after origination. Banks should anticipate the implications of rapid exposure growth and take steps to ensure that their estimation techniques are accurate, and that their current capital level and earnings and funding prospects are adequate to cover their future capital needs (in light of probable increase in PD with more and more ageing of the exposure). In order to avoid gyrations in their required capital positions arising from short-term PD horizons, banks are also encouraged to adjust PD estimates upward for anticipated seasoning effects, provided such adjustments are applied in a consistent fashion over time.

Additional standards for own LGD estimation for retail exposure

85. The minimum data observation period for LGD estimates for retail exposures is five years. The less data a bank has the more conservative it must be in its estimation. A bank need not give equal importance to historic data if it can demonstrate to the RBI that more recent data are a better predictor of loss rates.

Additional standards for own EAD estimation for retail exposure

86. The minimum data observation period for EAD estimates for retail exposures is five years. The less data a bank has the more conservative it must be in its estimation. A bank need not give equal importance to historic data if it can demonstrate to the RBI that more recent data are a better predictor of draw downs.

Minimum requirements for assessing effect of guarantees and credit derivatives- Standards for corporate, sovereign, and bank exposures where own estimates of LGD (A-IRB) are used and standards for retail exposures

Guarantees

87. When a bank uses its own estimates of LGD, it may reflect the risk-mitigating effect of guarantees through an adjustment to PD or LGD estimates. The option to adjust LGDs is available only to those banks that have been approved to use their own internal estimates of LGD. For retail exposures, where guarantees exist, either in support of an individual obligation or a pool of exposures, a bank may reflect the risk-reducing effect either through its estimates of PD or LGD, provided this is done consistently. In adopting one or the other technique, a bank must adopt a consistent approach, both across types of guarantees and over time.

88. In all cases, both the borrower and all recognised guarantors must be assigned a borrower rating at the outset and on an ongoing basis. A bank must follow all minimum requirements for assigning borrower ratings set out in this document, including the regular monitoring of the guarantor's condition and ability and willingness to honour its obligations. Consistent with the requirements in paragraphs 52-53 of this appendix, a bank must retain all relevant information on the borrower without the guarantee and the guarantor. In the case of retail guarantees,

these requirements also apply to the assignment of an exposure to a pool, and the estimation of PD.

89. In no case, the bank can assign the guaranteed exposure 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 purposes of regulatory minimum capital requirements. As such, the adjusted risk weight must not reflect the risk mitigation of "double default."

Eligible guarantors and guarantees

90. There are no restrictions on the types of eligible guarantors. The bank must, however, have clearly specified criteria for the types of guarantors it will recognise for regulatory capital purposes.

91. The guarantee must be evidenced in writing, non-cancellable on the part of the guarantor, in force until the debt is satisfied in full (to the extent of the amount and tenor of the guarantee) and legally enforceable against the guarantor in a jurisdiction where the guarantor has assets to attach and enforce a judgement.

Adjustment criteria

92. A bank must have clearly specified criteria for adjusting borrower grades or LGD estimates (or in the case of retail and eligible purchased receivables, the process of allocating exposures to pools) to reflect the impact of guarantees for regulatory capital purposes. These criteria must be as detailed as the criteria for assigning exposures to grades consistent with paragraphs 21 and 22 of this Appendix, and must follow all minimum requirements for assigning borrower or facility ratings set out in this document.

93. The criteria must be plausible and intuitive, and must address the guarantor's ability and willingness to perform under the guarantee. The criteria must also address the likely timing of any payments and the degree to which the guarantor's

ability to perform under the guarantee is correlated with the borrower's ability to repay. The bank's criteria must also consider the extent to which residual risk to the borrower remains, for example a currency mismatch between the guarantee and the underlying exposure.

Credit derivatives

94. The minimum requirements for guarantees are relevant also for single-name credit derivatives. Additional considerations arise in respect of asset mismatches. The criteria used for assigning adjusted borrower grades or LGD estimates (or pools) for exposures hedged with credit derivatives must require that the asset on which the protection is based (the reference asset) cannot be different from the underlying asset, unless the conditions outlined in the foundation approach as mentioned in para 3(vii) of Appendix 5 are met.

95. In addition, the criteria must address the payout structure of the credit derivative and conservatively assess the impact this has on the level and timing of recoveries. The bank must also consider the extent to which other forms of residual risk remain.

For banks using foundation LGD estimates

96. The minimum requirements outlined in paragraphs 87 -95 of this Appendix will also apply to banks using the foundation LGD estimates (along with the conditions mentioned in Appendix 5) with the following exceptions:

(a) The bank is not able to use an 'LGD-adjustment' option as mentioned in para 87 of this appendix; and

(b) The range of eligible guarantees and guarantors is limited to those outlined in para 4 of Appendix 5 of this guideline.

<u>Requirements specific to estimating PD and LGD for qualifying purchased receivables</u>

97. The following minimum requirements for risk quantification must be satisfied for any purchased receivables (corporate or retail) making use of the top-down treatment of default risk and/or the IRB treatments of dilution risk.

- The purchasing bank will be required to group the receivables into sufficiently homogeneous pools so that accurate and consistent estimates of PD and LGD (or EL) for default losses and EL estimates for dilution losses can be determined. In general, the risk bucketing process will reflect the seller's underwriting practices and the heterogeneity of its customers. In addition, methods and data for estimating PD, LGD, and EL must comply with the existing risk quantification standards for retail exposures. In particular, quantification should reflect all information available to the purchasing bank regarding the quality of the underlying receivables, including data for similar pools provided by the seller, by the purchasing bank, or by external sources. The purchasing bank must determine whether the data provided by the seller are consistent with expectations agreed upon by both parties concerning, for example, the type, volume and on-going quality of receivables purchased. Where this is not the case, the purchasing bank is expected to obtain and rely upon more relevant data.

- A bank purchasing receivables has to justify confidence that current and future advances can be repaid from the liquidation of (or collections against) the receivables pool.

- To qualify for the top-down treatment of default risk, the receivable pool and overall lending relationship should be closely monitored and controlled. Specifically, a bank will have to demonstrate the following:

(a) Legal certainty

The structure of the facility must ensure that under all foreseeable circumstances, the bank has effective ownership and control of the cash remittances from the receivables, including incidences of seller or servicer distress and bankruptcy. When the obligor makes payments directly to a seller or servicer, the bank must verify regularly that payments are forwarded completely and within the contractually agreed terms as well. Ownership over the receivables and cash receipts should be protected against bankruptcy stays or legal challenges that could materially delay the lender's ability to liquidate/assign the receivables or retain control over cash receipts.

(b) Effectiveness of monitoring system

The bank must be able to monitor both the quality of the receivables and the financial condition of the seller and servicer. In particular:

- The bank must (a) assess the correlation among the quality of the receivables and the financial condition of both the seller and servicer, and (b) have in place internal policies and procedures that provide adequate safeguards to protect against such contingencies, including the assignment of an internal risk rating for each seller and servicer.

- The bank must have clear and effective policies and procedures for determining seller and servicer eligibility. The bank or its agent must conduct periodic reviews of sellers and servicers in order to verify the accuracy of reports from the seller/servicer, detect fraud or operational weaknesses, and verify the quality of the seller's credit policies and servicer's collection policies and procedures. The findings of these reviews must be well documented.

- The bank must have the ability to assess the characteristics of the receivables pool, including (a) over-advances; (b) history of the seller's arrears, bad debts, and bad debt allowances; (c) payment terms, and (d) potential contra accounts.

- The bank must have effective policies and procedures for monitoring on an aggregate basis single-obligor concentrations both within and across receivables pools.

- The bank must receive timely and sufficiently detailed reports of receivables ageing and dilutions to (a) ensure compliance with the bank's eligibility criteria and advancing policies governing purchased receivables, and (b) provide an effective means with which to monitor and confirm the seller's terms of sale (e.g. invoice date ageing) and dilution.

(c) Effectiveness of work-out systems

An effective programme requires systems and procedures not only for detecting deterioration in the seller's financial condition and deterioration in the quality of the receivables at an early stage, but also for addressing emerging problems pro-actively. In particular,

- The bank should have clear and effective policies, procedures, and information systems to monitor compliance with (a) all contractual terms of the facility (including covenants, advancing formulas, concentration limits etc.) as well as (b) the bank's internal policies governing advance rates and receivables eligibility. The bank's systems should track covenant violations and waivers as well as exceptions to established policies and procedures.

- To limit inappropriate draws, the bank should have effective policies and procedures for detecting, approving, monitoring, and correcting over-advances.

- The bank should have effective policies and procedures for dealing with financially weakened sellers or servicers and/or deterioration in the quality of

receivable pools. These include, but are not necessarily limited to, early termination triggers in revolving facilities and other covenant protections, a structured and disciplined approach to dealing with covenant violations, and clear and effective policies and procedures for initiating legal actions and dealing with problem receivables.

(d) Effectiveness of systems for controlling collateral, credit availability and cash

The bank must have clear and effective policies and procedures governing the control of receivables, credit, and cash. In particular,

- Written internal policies must specify all material elements of the receivables purchase programme, including the advancing rates, eligible collateral, necessary documentation, concentration limits, and how cash receipts are to be handled. These elements should take appropriate account of all relevant and material factors, including the seller's/servicer's financial condition, risk concentrations, and trends in the quality of the receivables and the seller's customer base.

- Internal systems must ensure that funds are advanced only against specified supporting collateral and documentation (such as servicer attestations, invoices, shipping documents, etc.).

(e) Compliance with bank's internal policies and procedures

Given the reliance on monitoring and control systems to limit credit risk, the bank should have an effective internal process for assessing compliance with all critical policies and procedures, including

- regular internal and/or external audits of all critical phases of the bank's receivables purchase programme.

- verification of the separation of duties (i) between the assessment of the seller/servicer and the assessment of the obligor and (ii) between the assessment of the seller/servicer and the field audit of the seller/servicer.

98. A bank's effective internal process for assessing compliance with all critical policies and procedures should also include evaluations of back office operations, with particular focus on qualifications, experience, staffing levels, and supporting systems.

(H) Validation of internal estimates

99. Banks must have a robust, documented system in place to validate on an ongoing basis the accuracy of rating systems, associated risk estimates (quantitative validation), and operational integrity and consistency of those systems and estimates (process validation). A bank must demonstrate to the RBI that the internal validation process enables it to assess the performance of internal rating and risk estimation systems consistently and meaningfully. Further banks must ensure that the process for developing and initially implementing all IRB rating system and risk estimates quantification processes include the initial validation which may involve initial testing of the model and associated data reference sets (quantitative validation) and the model's robust implementation (process validation)

100. Banks must regularly compare realised default rates with estimated PDs for each grade and be able to demonstrate that the realised default rates are within the expected range for that grade. Banks using the advanced IRB approach must also complete such analysis for their estimates of LGDs and EADs. Such comparisons must make use of historical data that are over as long a period as possible. The methods and data used in such comparisons by the bank must be clearly documented by the bank. This analysis and documentation must be updated at least annually.

101. Banks must also use other quantitative validation tools and comparisons with relevant external data sources. The analysis must be based on data that are appropriate to the portfolio, are updated regularly, and cover a relevant observation period. Banks' internal assessments of the performance of their own rating systems must be based on long data histories, covering a range of economic conditions, and ideally one or more complete business cycles.

102. Banks must demonstrate that quantitative testing methods and other validation methods do not vary systematically with the economic cycle. Changes in methods and data (both data sources and periods covered) must be clearly and thoroughly documented.

103. Banks must have well-articulated internal standards for situations where deviations in realised PDs, LGDs and EADs from expectations become significant enough to call the validity of the estimates into question. These standards must take account of business cycles and similar systematic variability in default experiences. Where realised values continue to be higher than expected values, banks must revise estimates upward to reflect their default and loss experience.

104. Where banks rely on the RBI for LGD and EAD, rather than internal estimates of these risk parameters, they are encouraged to compare realised LGDs and EADs to those set by the RBI. The information on realised LGDs and EADs should form part of the bank's assessment of economic capital.

(l) Requirements for recognition of leasing

105. Leases other than those that expose the bank to residual value risk (see the following paragraph 106) will be accorded the same treatment as exposures collateralised by the same type of collateral. The minimum requirements for the collateral type must be met (CRE/RRE or other collateral). In addition, the bank must also meet the following standards:

- Robust risk management on the part of the lessor with respect to the location of the asset, the use to which it is put, its age, and planned obsolescence;
- A robust legal framework establishing the lessor's legal ownership of the asset and its ability to exercise its rights as owner in a timely fashion; and
- The difference between the rate of depreciation of the physical asset and the rate of amortisation of the lease payments must not be so large as to overstate the CRM attributed to the leased assets.

106. Residual value risk is the bank's exposure to potential loss due to the fair value of the leased asset declining below its residual value at lease inception. Leases that expose the bank to residual value risk will be treated in the following manner.

- The discounted lease payment stream i.e. the exposure will receive a risk weight appropriate for the lessee's financial strength (PD) and supervisory or own-estimate of LGD, whichever is appropriate.

- The residual value of the leased asset will be risk-weighted at 100%.

(J) Eligibility criteria for calculation of capital charges for equity exposures under internal model method

The internal models method of market-based approach

107. To be eligible for the internal models method of market-based approach, a bank must demonstrate to the RBI that it meets certain quantitative and qualitative minimum requirements at the outset and on an ongoing basis. A bank that fails to demonstrate continued compliance with the minimum requirements must develop a plan for rapid return to compliance, obtain RBI's approval of the plan, and implement that plan in a timely fashion. In the interim, banks would be expected to compute capital charges using a simple risk weight approach or PD/LGD approach if permissible.

Capital charge and risk quantification

108. The following minimum quantitative standards apply for the purpose of calculating minimum capital charges under the internal models approach.

- The capital charge is equivalent to the potential loss on the institution's equity portfolio arising from an assumed instantaneous shock equivalent 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.

- The estimated losses should be robust to adverse market movements relevant to the long-term risk profile of the institution's specific holdings. The data used to represent return distributions should reflect the longest sample period for which data are available and meaningful in representing the risk profile of the bank's specific equity holdings. The data used should be sufficient to provide conservative, statistically reliable and robust loss estimates that are not based purely on subjective or judgmental considerations. Banks must demonstrate to RBI that the shock employed provides a conservative estimate of potential losses over a relevant long-term market or business cycle. Models estimated using data not reflecting realistic ranges of long-run experience, including a period of reasonably severe declines in equity market values relevant to a bank's holdings, are presumed to produce optimistic results unless there is credible evidence of appropriate adjustments built into the model. In the absence of built-in adjustments, the

bank must combine empirical analysis of available data with adjustments based on a variety of factors in order to attain model outputs that achieve appropriate realism and conservatism. In constructing Value at Risk (VaR) models estimating potential quarterly losses, institutions may use quarterly data or convert shorter horizon period data to a quarterly equivalent using an analytically appropriate method supported by empirical evidence. Such adjustments must be applied through a well-developed and well-documented thought process and analysis. In general, adjustments must be applied conservatively and consistently over time. Furthermore, where only limited data are available or where technical limitations are such that estimates from any single method will be of uncertain quality, banks must add appropriate margins of conservatism in order to avoid over-optimism.

- No particular type of VaR model (e.g. variance-covariance, historical simulation, or Monte Carlo) is prescribed. However, the model used must be able to capture adequately all of the material risks embodied in equity returns including both the general market risk and specific risk exposure of the institution's equity portfolio. Internal models must adequately explain historical price variation, capture both the magnitude and changes in the composition of potential concentrations, and be robust to adverse market environments. The population of risk exposures represented in the data used for estimation must be closely matched to or at least comparable with those of the bank's equity exposures.

- Banks may also use modelling techniques such as historical scenario analysis to determine minimum capital requirements for banking book equity holdings. The use of such models is conditioned upon the bank demonstrating to RBI that the methodology and its output can be quantified in the form of the loss percentile specified under the first bullet here.

- Banks must use an internal model that is appropriate for the risk profile and complexity of their equity portfolio. Banks with material holdings with values that are highly non-linear in nature (e.g. equity derivatives, convertibles) must employ an internal model designed to capture appropriately the risks associated with such instruments.

- Subject to RBI review, equity portfolio correlations can be integrated into a bank's internal risk measures. The use of explicit correlations (e.g. utilisation of a variance/covariance VaR model) must be fully documented and supported using empirical analysis. The appropriateness of implicit correlation assumptions will be evaluated by RBI.

- Mapping of individual positions to proxies, market indices, and risk factors should be plausible, intuitive, and conceptually sound. Mapping techniques and processes should be fully documented, and demonstrated with both theoretical and empirical evidence to be appropriate for the specific holdings. Where professional judgement is combined with quantitative techniques in

estimating a holding's return volatility, the judgement must take into account the relevant and material information not considered by the other techniques utilised.

- Where factor models are used, either single or multi-factor models are acceptable depending upon the nature of an institution's holdings. Banks are expected to ensure that the factors are sufficient to capture the risks inherent in the equity portfolio. Risk factors should correspond to the appropriate equity market characteristics (for example, public, private, market capitalisation industry sectors and sub-sectors, operational characteristics) in which the bank holds significant positions. While banks will have discretion in choosing the factors, they must demonstrate through empirical analyses the appropriateness of those factors, including their ability to cover both general and specific risk.

- Estimates of the return volatility of equity investments must incorporate relevant and material available data, information, and methods. A bank may utilise independently reviewed internal data or data from external sources (including pooled data). The number of risk exposures in the sample, and the data period used for quantification must be sufficient to provide the bank with confidence in the accuracy and robustness of its estimates. Institutions should take appropriate measures to limit the potential of both sampling bias and survivorship bias in estimating return volatilities.

- A rigorous and comprehensive stress-testing programme must be in place. Banks are expected to subject their internal model and estimation procedures, including volatility computations, to either hypothetical or historical scenarios that reflect worst-case losses given underlying positions in both public and private equities. At a minimum, stress tests should be employed to provide information about the effect of tail events beyond the level of confidence assumed in the internal models approach.

Risk management process and controls

109. Banks' overall risk management practices used to manage their banking book equity investments are expected to be consistent with the evolving sound practice guidelines issued by the RBI. With regard to the development and use of internal models for capital purposes, banks must have established policies, procedures, and controls to ensure the integrity of the model and modelling process used to derive regulatory capital standards. These policies, procedures, and controls should include the following:

(a) Full integration of the internal model into the overall management information systems of the bank and in the management of the banking book equity portfolio.

Internal models should be fully integrated into the bank's risk management infrastructure including use in: (i) establishing investment hurdle rates and evaluating alternative investments; (ii) measuring and assessing equity portfolio performance (including the risk-adjusted performance); and (iii) allocating economic capital to equity holdings and evaluating overall capital adequacy as required under Pillar 2. The institution should be able to demonstrate, through for example, investment committee minutes, that internal model output plays an essential role in the investment management process.

(b) Established management systems, procedures, and control functions for ensuring the periodic and independent review of all elements of the internal modelling process, including approval of model revisions, vetting of model inputs, and review of model results, such as direct verification of risk computations. Proxy and mapping techniques and other critical model components should receive special attention. These reviews should assess the accuracy, completeness, and appropriateness of model inputs and results and focus on both finding and limiting potential errors associated with known weaknesses and identifying unknown model weaknesses. Such reviews may be conducted as part of internal or external audit programmes, by an independent risk control unit, or by an external third party.

(c) Adequate systems and procedures for monitoring investment limits and the risk exposures of equity investments.

(d) The units responsible for the design and application of the model must be functionally independent from the units responsible for managing individual investments.

(e) Parties responsible for any aspect of the modelling process must be adequately qualified. Management must allocate sufficient skilled and competent resources to the modelling function.

Validation and documentation

110. Institutions employing internal models for regulatory capital purposes are expected to have in place a robust system to validate the accuracy and consistency of the model and its inputs. They must also fully document all material elements of their internal models and modelling process. The modelling process itself as well as the systems used to validate internal models including all supporting documentation, validation results, and the findings of internal and external reviews are subject to oversight and review by the RBI.

Validation

111. Banks must have a robust system in place to validate the accuracy and consistency of their internal models and modelling processes. A bank must demonstrate to RBI that the internal validation process enables it to assess the performance of its internal model and processes consistently and meaningfully.

112. Banks must regularly compare actual return performance (computed using realised and unrealised gains and losses) with modelled estimates and be able to demonstrate that such returns are within the expected range for the portfolio and individual holdings. Such comparisons must make use of historical data that are over as long a period as possible. The methods and data used in such comparisons must be clearly documented by the bank. This analysis and documentation should be updated at least annually.

113. Banks should make use of other quantitative validation tools and comparisons with external data sources. The analysis must be based on data that are appropriate to the portfolio, are updated regularly, and cover a relevant observation period. Banks' internal assessments of the performance of their own model must be based on long data histories, covering a range of economic conditions, and ideally one or more complete business cycles.

114. Banks must demonstrate that quantitative validation methods and data are consistent through time. Changes in estimation methods and data (both data sources and periods covered) must be clearly and thoroughly documented.

115. Since the evaluation of actual performance to expected performance over time provides a basis for banks to refine and adjust internal models on an ongoing basis, it is expected that banks using internal models will have established well-articulated model review standards. These standards are especially important for situations where actual results significantly deviate from expectations and where the validity of the internal model is called into question. These standards must take account of business cycles and similar systematic variability in equity returns. All adjustments

made to internal models in response to model reviews must be well documented and consistent with the bank's model review standards.

116. To facilitate model validation through backtesting on an ongoing basis, institutions using the internal model approach must construct and maintain appropriate databases on the actual quarterly performance of their equity investments as well on the estimates derived using their internal models. Banks should also back test the volatility estimates used within their internal models (for equity exposures in banking book) and the appropriateness of the proxies used in the model. RBI may ask banks to scale their quarterly forecasts to a different, in particular shorter, time horizon, store performance data for this time horizon and perform backtests on this basis.

Documentation

117. The burden is on the bank to satisfy the RBI that a model has good predictive power and that regulatory capital requirements will not be distorted as a result of its use. Accordingly, all critical elements of an internal model and the modelling process should be fully and adequately documented. Banks must document in writing their internal model's design and operational details. The documentation should demonstrate banks' compliance with the minimum quantitative and qualitative standards, and should address topics such as the application of the model to different segments of the portfolio, estimation methodologies, responsibilities of parties involved in the modelling, and the model approval and model review processes. In particular, the documentation should address the following points:

(a) A bank must document the rationale for its choice of internal modelling methodology and must be able to provide analyses demonstrating that the model and modelling procedures are likely to result in estimates that meaningfully identify the risk of the bank's equity holdings. Internal models and procedures must be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions. In addition, a bank must document a history of major changes in the model over time and changes made to the modelling process subsequent to the last supervisory review. If changes have been made in response to the bank's internal review standards, the bank must document that these changes are consistent with its internal model review standards.

(b) In documenting their internal models banks should:

- provide a detailed outline of the theory, assumptions and/or mathematical and empirical basis of the parameters, variables, and data source(s) used to estimate the model;

- establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the selection of explanatory variables; and

- indicate circumstances under which the model does not work effectively or its limitations.

(c) Where proxies and mapping are employed, institutions must have performed and documented rigorous analysis demonstrating that all chosen proxies and mappings are sufficiently representative of the risk of the equity holdings to which they correspond. The documentation should show, for instance, the relevant and material factors (e.g. business lines, balance sheet characteristics, geographic location, company age, industry sector and subsector, operating characteristics) used in mapping individual investments into proxies. In summary, institutions must demonstrate that the proxies and mappings employed:

- are adequately comparable to the underlying holding or portfolio;

- are derived using historical economic and market conditions that are relevant and material to the underlying holdings or, where not, that an appropriate adjustment has been made; and,

- are robust estimates of the potential risk of the underlying holding.

K. Disclosure requirements

118. In order to be eligible for the IRB approach, banks must meet the additional disclosure requirements set out in Appendix 11. These are minimum requirements for use of IRB; failure to meet these will render banks ineligible to use the relevant IRB approach.

Appendix 2

Categories of Specialised lending sub-asset classes under corporate exposure

The corporate asset class includes, but is not limited to, the following four asset sub classes of specialised lending (SL):

1. Project finance

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 (in case of default by the borrower). This type of financing is usually for large, complex and expensive installations that might include, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure etc. In such transactions, the 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 i.e. usual corporate exposure to that end-user.

2. Object finance

Object finance (OF) refers to a method of funding the acquisition of physical assets (e.g. ships, aircraft, satellites, railcars, and fleets) where the repayment of the exposure is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the 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 usual collateralised corporate exposure.

3. Commodities finance

Commodities finance (CF) refers to structured short-term lending to finance reserves (e.g. minerals reserves), inventories, or receivables of exchange-traded commodities

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. Such lending can be distinguished from exposures financing the reserves, inventories, or receivables of other more diversified corporate borrowers where the value of the commodity serves as a risk mitigant (kind of collateral) rather than as the primary source of repayment.

4. Income producing real estate (IPRE)/Commercial real estate (CRE)

This refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the repayment and recovery on the exposure primarily depends on the cash flows (i.e. more than 50% of cash flows required for repayment and recovery are generated from the asset) generated by the asset. These cash flows would generally be lease or rental payments or the sale of the assets as also for recovery in the event of default where such asset is taken as security. The borrower may be an SPE (but not necessarily), an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. In case of CRE, there is a 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 (either from the lease or rental payments or from sale of the asset). In case of other usual corporate exposures collateralised by real estate, this correlation is low or negligible because of the income generating capacity of the corporate from various other sources than the real estate property funded by the exposure. Commercial Real Estate as defined in the extant "Guidelines on classification of exposures as Commercial Real Estate" will also be included in this asset class.

Appendix 3

Collateral related issues for LGD calculation

1. Two types of collateral that the banks may use for IRB approaches are given below:

A. Eligible financial collateral

B. Eligible IRB collateral

A. Eligible financial collateral (also recognised under the standardised approach of Basel II) will consist of the following items:

i. Cash (as well as certificates of deposit or comparable instruments, including fixed deposit receipts, issued by the lending bank) deposit with the bank which is incurring the counterparty exposure

ii. Gold would include both bullion and jewellery. However, the value of the collateralised jewellery should be arrived at after notionally converting these to 99.99 purity

iii. Securities issued by Central and State Governments

iv. Kisan Vikas Patra and National Savings Certificates provided no lock-in period is operational and if they can be encashed within the holding period

v. Life insurance policies with a declared surrender value of an insurance company which is regulated by an insurance sector regulator

vi. Debt securities rated by a RBI approved Credit Rating Agency in respect of which the banks should be sufficiently confident about the market liquidity (A debenture would meet the test of liquidity if it is traded on a recognised stock exchange(s) on at least 90 per cent of the trading days during the preceding 365 days. Further, liquidity can be evidenced in the trading during the previous one month in the recognised stock exchange if there are a minimum of 25 trades of marketable lots in securities of each issuer.) where these are either:

a) Attracting 100 per cent or lesser risk weight i.e. rated at least BBB(-) when issued by public sector entities and other entities (including banks and Primary Dealers); or

b) Attracting 100 per cent or lesser risk weight i.e., rated at least PR3 /P3/F3/A3 for short-term debt instruments.

vii. Debt securities not rated by a RBI approved Credit Rating Agency in respect of which the banks should be sufficiently confident about the market liquidity where these are:

a) issued by a bank; and

b) listed on a recognised exchange; and

c) classified as senior debt; and

d) all rated issues of the same seniority by the issuing bank are rated at least BBB(-) or PR3/P3/F3/A3 by a RBI approved Credit Rating Agency; and

e) the bank holding the securities as collateral has no information to suggest that the issue justifies a rating below BBB(-) or PR3/P3/F3/A3 (as applicable) and

f) Banks should be sufficiently confident about the market liquidity of the security

viii. Units of Mutual Funds regulated by SEBI where:

a) a price for the units is publicly quoted daily i.e., where the daily NAV is available in public domain; and

b) Mutual fund is limited to investing in the instruments listed in this paragraph.

B. Eligible IRB collateral

2. In addition to the eligible financial collateral as mentioned above, some other collateral are also recognised under IRB approaches which are mentioned as IRB collaterals. These may be of the following types

i. Eligible Financial Receivables

ii. Commercial or Residential Real Estate (CRE/RRE)

iii. Other physical Collaterals

The eligibility criteria of each of the three types of IRB collaterals will be as given below:

Eligible Financial Receivables

3. Eligible financial receivables are claims with an original maturity of less than or equal to one year where repayment will occur through the commercial or financial flows related to the underlying assets of the borrower. This includes 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, national and local 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 any derivatives.

Operational requirements

4. The operational requirements for the Financial Receivables are as mentioned below:

(a) Legal Certainty

- The legal mechanism by which collateral is given must be robust and ensure that the lender has clear rights over the proceeds from the collateral.

- Banks must take all steps necessary to fulfil requirements in respect of the enforceability of charge certificate, e.g. registering a charge on collateral with a registrar. There should be a framework that allows the potential lender to have a perfected first priority claim over the collateral.

- All documentation used in collateralised transactions must be binding on all parties and legally enforceable. Banks must have conducted sufficient legal review to verify this and have a well founded legal basis to reach this conclusion, and undertake such further review as necessary to ensure continuing enforceability.

- The collateral arrangements must be properly documented, with a clear and robust procedure for the timely collection of collateral proceeds. Banks' procedures should ensure that any legal conditions required for declaring the default of the customer and timely collection of collateral are observed. In the event of the customer's financial distress or default, the bank should have legal authority to sell or assign the receivables to other parties without consent of the receivables' obligors.

(b) Risk Management

- The bank must have a sound process for determining the credit risk in the receivables. Such a process should include, among other things, analysis of the borrower's business and industry (e.g. effects of the business cycle) and the types of customers with whom the borrower does business. Where the bank relies on the borrower to ascertain the credit risk of the customers, the bank must review the borrower's credit policy to ascertain its soundness and credibility.

- The margin between the amount of the exposure and the value of the receivables must reflect all appropriate factors, including the cost of collection, concentration within the receivables pool pledged by an individual borrower, and potential concentration risk within the bank's total exposures.

- The bank must maintain a continuous monitoring process that is appropriate for the specific exposures (either immediate or contingent) attributable to the receivable to be utilised as a risk mitigant. This process may include, as appropriate and relevant, ageing reports, control of trade documents, stock/receivables statement, frequent audits of collateral, confirmation of accounts, control of the proceeds of accounts paid, analysis of dilution (credits given by the borrower to the issuers) and regular financial analysis of both the borrower and the sellers of the receivables, especially in the case when a small number of large-sized receivables are taken as collateral. Observance of the bank's overall concentration limits should be monitored. Additionally, compliance with loan covenants, environmental restrictions, and other legal requirements should be reviewed on a regular basis.

- The receivables pledged by a borrower should be diversified and not be unduly correlated with the borrower. Where the correlation is high, e.g. where some issuers of the receivables are reliant on the borrower for their viability or the borrower and the issuers belong to a common industry, the attendant risks should be taken into account in the setting of margins for the collateral pool as a whole. Receivables from affiliates of the borrower (including subsidiaries and employees) will **not** be recognised as risk mitigants.

- The bank should have a documented process for collecting receivable payments in distressed situations. The requisite facilities for collection should be in place, even when the bank normally looks to the borrower for collections.

Commercial or Residential Real Estate (CRE/RRE)

5. Eligible CRE/RRE collaterals for exposures to corporate, sovereign and banks are the ones where the risk of the borrower is not materially dependent upon the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources. As such, repayment of

the facility is not materially dependent on any cash flow generated by the underlying CRE/RRE serving as collateral.

6. Additionally, the value of the collateral pledged must not be materially dependent on the performance of the borrower. This requirement is not intended to preclude situations where purely macro-economic factors affect both the value of the collateral and the performance of the borrower.

7. Commercial real estate that fall under the SL asset sub class of corporate exposure should be excluded as eligible CRE collateral.

Operational requirements

8. The Operational requirements for the CRE/RRE collaterals are as mentioned below:

Subject to meeting the definition above, CRE and RRE will be eligible for recognition as collateral for corporate claims only if all of the following operational requirements are met.

(a) Legal enforceability

Any claim on collateral taken must be legally enforceable in all relevant jurisdictions, and any claim on collateral must be properly filed on a timely basis. Collateral interests must reflect a perfected lien (i.e. all legal requirements for establishing the claim has been fulfilled). Furthermore, the collateral agreement and the legal process underpinning it must be such that they provide for the bank to realise the value of the collateral within a reasonable timeframe.

(b) Objective market value of collateral

The collateral must be valued at or less than the current fair value under which the property could be sold under private contract between a willing seller and an arm's-length buyer on the date of valuation.

(c) Frequent revaluation

The bank is expected to monitor the value of the collateral on a frequent basis and at a minimum once every year. More frequent monitoring is suggested where the market is subject to significant changes in conditions. Statistical methods of evaluation may be used to update estimates or to identify collateral that may have declined in value and that may need re-appraisal. A qualified professional valuer must evaluate the property when information indicates that the value of the collateral may have declined materially relative to general market prices or when a credit event, such as default, occurs.

(d)Charges other than first charge

Subsequent (to the first charge) charges may be taken into account where there is no doubt that the claim for collateral is legally enforceable and constitutes an efficient credit risk mitigant. When recognised, these charges are to be treated using the C*/C** threshold, which is used for first charges (in table 1 of para 48 of the Annex of this guideline). In such cases, the C* and C** are calculated by taking into account the sum of the subsequent charge and all of the more senior charges.

Additional collateral management requirements are as follows:

- The types of CRE and RRE collateral accepted by the bank and lending policies when this type of collateral is taken must be clearly documented.
- The bank must take steps to ensure that the property taken as collateral is adequately insured against damage or deterioration.
- The bank must monitor on an ongoing basis the extent of any permissible prior claims (e.g. tax) on the property.
- The bank must appropriately monitor the risk of environmental liability arising in respect of the collateral, such as the presence of toxic material on a property.

Other Collaterals

9. In addition to the above types of collaterals, RBI may permit banks to recognise other physical collaterals as risk mitigants which meet the following two standards:

- Existence of liquid markets for disposal of collateral in an expeditious and economically efficient manner.

- Existence of well established, publicly available market prices for the collateral or Board approved policy of regular collateral valuation with qualified professionals. RBI should be certain that the amount a bank receives when collateral is realised does not deviate significantly from these market prices.

In order for a given bank to receive recognition for additional physical (other) collateral, it must meet all the standards in paragraphs (para 8 above), subject to the following modifications.

- First Claim: First charge/first pari-passu charge (proportionate claim) over other collaterals is permissible. As such, the bank must have priority over all other lenders to the realised proceeds of the collateral.

- The loan agreement must include detailed descriptions of the collateral plus detailed specifications of the manner and frequency of revaluation.

- The types of physical collateral accepted by the bank and policies and practices in respect of the appropriate amount of each type of collateral relative to the exposure amount must be clearly documented in internal credit policies and procedures and available for examination and/or audit review.

- Bank credit policies with regard to the transaction structure must address appropriate collateral requirements relative to the exposure amount, the ability to liquidate the collateral readily, the ability to establish objectively a price or market value, the frequency with which the value can readily be obtained (including a professional appraisal or valuation), and the volatility of the value of the collateral. The periodic revaluation process must pay particular attention to obsolescence prone collaterals to ensure that valuations are appropriately adjusted downward of fashion or model-year, obsolescence as well as physical obsolescence or deterioration.

In cases of machinery/equipments, the periodic revaluation process must include physical inspection of the collateral.

10. Once the banks have identified/categorised the collaterals, they need to calculate LGDs. Banks would adjust the collaterals and sometimes exposures with some percentage known as haircuts (in case of eligible financial collaterals). How to calculate the haircuts and apply them to collaterals and exposures is described below.

Calculation of Exposure amount after risk mitigation with eligible financial collaterals

11. For Foundation IRB method, the Comprehensive Approach mentioned in the Standardised method of Basel II for recognition of collateral will be followed. In the Comprehensive Approach, when taking collateral, banks will need to calculate their adjusted exposure to a counterparty for capital adequacy purposes in order to take account of the effects of that collateral. Banks are required to adjust both the amount of the exposure to the counterparty or/and the value of any collateral received in support of that counterparty to take account of possible future fluctuations in the value of either, occasioned by market movements (exposure amount may vary when securities have been lent by the banks or given as collateral for repo type transactions. These adjustments are referred to as 'haircuts'. The application of haircuts will produce volatility adjusted amounts for both exposure and collateral. The volatility adjusted amount for the exposure will be higher than the exposure and the volatility adjusted amount for the collateral will be lower than the collateral, unless either side of the transaction is cash. In other words, the 'haircut' for the exposure will be a premium factor and the 'haircut' for the collateral will be a discount factor. It may be noted that the purpose underlying the application of haircut is to capture the market-related volatility inherent in the value of exposures as well as of the eligible financial collaterals. Since the value of credit exposures acquired by the banks in the course of their banking operations, would not be subject to market volatility, (since the loan disbursal / investment would be a "cash" transaction) though the value of eligible financial collateral would be, the haircut stipulated would apply in respect of credit transactions would apply only to the eligible collateral but not to the credit exposure of the bank.

12. Exposures of banks, arising out of repo-style transactions would require upward adjustment for volatility, as the value of security sold/lent/pledged by the borrowing bank in the repo transaction, would be subject to market volatility. Hence, such exposures (as securities sold/lent/pledged is the exposure of the bank and the cash borrowed will be treated as collateral) shall attract haircut. But collateral such as cash will not attract any adjustment in terms of discount.

13. However, where the exposure and collateral are held in different currencies an additional downwards adjustment must be made to the volatility adjusted collateral amount to take account of possible future fluctuations in exchange rates.

14. Where the volatility-adjusted exposure amount is greater than the volatility-adjusted collateral amount (including any further adjustment for foreign exchange risk which is dealt with subsequently), banks shall calculate the adjusted exposure framework for performing these calculations is set out below.

15. For a collateralised transaction, the exposure amount after risk mitigation is calculated as follows:

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

where:

E^* = the exposure value after risk mitigation

E = current value of the exposure without risk mitigation

H_e = haircut appropriate to the exposure (in case of repo style transactions)

C = the current value of the collateral received

H_c = haircut appropriate to the collateral

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

This adjusted value of the collateralised exposure (E^*) will later be used in the formula meant for LGD* calculation given in eqn. Mentioned in para 57 of the annex of this guideline.

Where the collateral is a basket of assets, the haircut on the basket will be,

$$H = \sum_i a_i H_i$$

where a_i is the weight of the asset (as measured by units of currency) in the basket and H_i the haircut applicable to that asset.

16. In principle, banks have two ways of calculating the haircuts of the exposures or the collaterals:

(i) standard supervisory haircuts, as given in Table 2 and 3 below, and

(ii) own estimate haircuts, using banks' own internal estimates of market price volatility.

17. The Standard Supervisory Haircuts (assuming daily mark-to-market, daily re-margining and a 10 business-day holding period), expressed as percentages, is as furnished in tables (2 and 3) below. Holding period implies the time normally required by the bank to realise the value of the collateral.

18. The ratings indicated in Table – 2 represent the ratings assigned by the domestic rating agencies. In the case of exposures toward debt securities issued by foreign Central Governments and foreign corporates, the haircut may be based on ratings of the international rating agencies, as indicated in Table 3.Sovereign will also include Reserve Bank of India, DICGC and CGTSI.

19. Banks may apply a zero haircut for eligible collateral where it is a National Savings Certificate, Kisan Vikas Patras, surrender value of insurance policies and banks' own deposits.

20. The standard supervisory haircut for currency risk where exposure and collateral are denominated in different currencies is eight per cent (based on a 10-business day holding period and daily mark-to-market- H_{fx} in eqn. A of para 15 of this appendix).

If securities arising out of securitisation transaction are used as collaterals and fall under the same classification as in B (ii) and B (iii) categories as in table 2, then those will attract double the haircut compared to haircut on other securities in the same category. Also, in table 3, if securities arising out of securitisation transactions are used as collaterals, then those will attract double the haircut compared to the haircut applied to securities issued by other issuers as given in column 4 under respective categories.

Table 2 : **Standard Supervisory Haircuts for Sovereign and other securities which constitute Exposure and Collateral**

Sl No.		Issue rating for debt securities	Residual maturity (yrs.)	Haircut (%)
A	**Securities issued / guaranteed by the Government of India and issued by the State Governments (Sovereign securities)**			
	i	Rating not available as Govt. securities are currently not rated in India	< or = 1 year	0.5
			> 1 yr. and < or = 5 yrs.	2
			> 5 yrs	4
B	**Domestic debt securities other than those indicated at Item No. A above including the securities guaranteed by Indian State Governments**			
	ii	AAA to AA PR1/P1/F1/A1	< or = 1 year	1
			> 1 yr. and < or = 5 yrs	4
			> 5 yrs	8
	iii	A to BBB PR2 / P2 / F2 /A2; PR3 /P3 / F3 / A3 and unrated bank securities	< or = 1 year	2
			> 1 yr. and < or = 5 yrs.	6
			> 5 yrs	12
	iv	Units of Mutual Fund	Highest haircut applicable to the any of the eligible securities in which the fund can invest	
C	**Cash in the same currency**			0
D	**Gold**			15

Table 3 : **Standard Supervisory Haircut for Exposures and Collaterals which are obligations of foreign central sovereigns/foreign corporate**

Issue rating for debt securities as assigned by international rating agencies	Residual Maturity	Sovereigns (Haircut %)	Other issues (Haircut %)
AAA to AA / A-1	< or = 1 year	0.5	1
	> 1 yr. and < or = 5 yrs.	2	4
	> 5 yrs	4	8
A to BBB / A-2 / A-3 / P-3 and Unrated Bank Securities	< or = 1 year	1	2
	> 1 yr. and < or = 5 yrs.	3	6
	> 5 yrs	6	12

21. If banks' exposures are unrated or bank lends non-eligible instruments in Market Repo transactions (i.e. non-investment grade corporate securities) then the haircut to be applied on such exposure should be 25 per cent.

Adjustment to the Haircut (Supervisory or own estimate) when holding periods and mark to market/remargining are not as per the standard ones (daily mark to market, daily remargining and 10 business day holding period) because of the nature of the transactions

Adjustment for Different holding periods

22. For some transactions, depending on the nature and frequency of the revaluation and remargining provisions, different holding periods (other than 10 business-days) are appropriate. The framework for collateral haircuts distinguishes between repo-style transactions (i.e. repo / reverse repos and securities lending / borrowing), "other capital-market-driven transactions" (i.e. OTC derivatives transactions and margin lending) and secured lending. In view of different holding periods, as per the nature of these transactions, the minimum holding periods shall be taken as indicated below

Transaction Type	Minimum holding Period	Condition
Repo-style transaction	five business days	daily remargining
Other capital market transactions	ten business days	daily remargining
Secured lending	twenty business days	daily revaluation

23. However, the standard haircut for the types of transactions as mentioned above will be assumed to be the ones as given in the table instead of 10 business days holding period as considered in Table 2 and 3 in para 20 of this appendix. Still, there may be transactions falling under the above categories which have holding period or/and remargining/revaluation provisions which are different than those mentioned in the above table. For those transactions the haircut of the collateral securities will be adjusted as mentioned in the paragraphs below

Adjustment in haircut for non-daily mark-to-market or remargining

24. In case a transaction has margining frequency longer than daily margining assumed, the applicable haircut for the transaction will also need to be adjusted by using the formula given below in equation B.

$$H = H_M \sqrt{\frac{N_R + (T_M - 1)}{T_M}} \quad \text{.....(B)}$$

where :

H = adjusted haircut;

H_M = haircut under minimum holding period (as in the table in para 20)

N_R = actual number of business days between remargining for capital market transactions or revaluation for secured transactions.

T_M = minimum holding period for the type of transaction

Adjustments in haircut for holding period different from the minimum holding periods

25. When the actual holding period for the above types of transactions are different than the minimum ones (as given in the table in para 22) the haircut for collateral securities under these transactions should be adjusted as per the following formula

$$H_N = H_M \sqrt{\frac{T_N}{T_M}} \quad \text{.....(C)}$$

where :

T_N = actual holding period of the transaction

H_N = adjusted haircut based on holding period T_N;

H_M= Haircut applicable for minimum holding period (as given in the table in para 20)

T_M = minimum holding period for the type of transaction (as given in the table in para 22)

These adjustments (as in para 24 and 25) have to be done for banks' own estimates of haircuts as well.

26. Banks may apply zero haircuts only to National Savings certificate (NSC), Kisan Vikas Patra (KVP), surrender value of the insurance policy, deposits maintained by the bank itself.

27. Market participants for repo style transactions will include the entities as mentioned by RBI from time to time (currently as per the extant Master Circular on Prudential Norms for classification, valuation and operation of investment portfolio by banks)

28. Own estimate of haircut

RBI may permit banks to calculate own estimate of haircuts using their own internal estimates of market price volatility and foreign exchange volatility. Permission to do so will be conditional on the satisfaction of minimum qualitative and quantitative standards stated in para 29.

Categorisation of securities for haircut estimation

(a) For debt securities rated below BBB-/A-3 equivalent or for equities (under units of mutual fund) eligible as collateral, banks must calculate haircut for each individual securities.

(b) For debt securities rated BBB-/A-3 equivalent or higher, banks may calculate volatility estimate for each category of security. In determining relevant categories, institutions must take into account (a) the type of issuer of the security, (b) its rating, (c) its residual maturity, and (d) its modified duration. Volatility estimates must be representative of the securities actually included in the category for that bank.

(c) Banks must estimate the volatility of the collateral instrument or foreign exchange mismatch individually i.e. the estimated volatilities must not include estimation of the correlation between unsecured exposure, collateral and exchange rates. A bank, permitted to use own estimate of haircut must also follow the requirements for maturity mismatches as given in para 64 to 66 of the annex of this guideline.

29. Criteria for calculating own estimate of haircut

In order to be granted permission by RBI to use own estimate of haircuts the banks have to meet the following criteria

Quantitative criteria

- In calculating the haircuts, a 99th percentile, one-tailed confidence interval is to be used.

- The minimum holding period will be dependent on the type of transaction and the frequency of remargining or marking to market as given in para 22 of this appendix. Banks may use haircut numbers calculated according to shorter holding periods, scaled up to the appropriate holding period by the square root of time formula as given in para 25 of this appendix.

- Banks must take into account the illiquidity of lower-quality assets. The holding period should be adjusted upwards in cases where such a holding period would be inappropriate given the liquidity of the collateral. They should also identify where historical data may understate potential volatility, e.g. a pegged currency. Such cases must be dealt with by subjecting the data to stress testing.

- The choice of historical observation period (sample period) for calculating haircuts shall be a minimum of one year. For banks that use a weighting scheme or other methods for the historical observation period, the "effective" observation period must be at least one year.

- Banks should update their data sets no less frequently than once every three months and should also reassess them whenever market prices are subject to material changes. This implies that haircuts must be computed at least every three months. The RBI may also require a bank to calculate its haircuts using a shorter observation period if, in the RBI's judgement; this is justified by a significant upsurge in price volatility.

Qualitative criteria

In addition to the quantitative criteria as mentioned above, banks will also have to meet the following qualitative criteria to be permitted to use own estimate of haircut.

- The estimated volatility data (and holding period) must be used in the day-to-day risk management process of the bank.

- Banks should have robust processes in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system.

- The risk measurement system should be used in conjunction with internal exposure limits.

- An independent review of the risk measurement system should be carried out regularly in the bank's own internal auditing process. A review of the overall

risk management process should take place at regular intervals (ideally not less than once a year) and should specifically address, at a minimum:

- the integration of risk measures into daily risk management
- the validation of any significant change in the risk measurement process;
- the accuracy and completeness of position data;
- the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and
- the accuracy and appropriateness of volatility assumptions.

All the adjustments as mentioned in para 22-25 of this appendix should be applicable to own estimate of haircuts as well.

Estimation of haircut by VaR

30. As an alternative to the use of standard or own-estimate haircuts, banks may be permitted on a case to case basis by the RBI to use a VaR model approach to reflect the price volatility of the exposure and collateral for repo-style transactions, taking into account correlation effects between security positions. This approach would apply to repo-style transactions covered by bilateral netting agreements on a counterparty-by-counterparty basis (In India, it will be applicable only when the market repo transactions in corporate debt securities become eligible for netting). At the discretion of the RBI, banks are also eligible to use the VaR model approach for margin lending transactions, if the transactions are covered under a bilateral master netting agreement that meets the requirements of paragraphs 89 and 90 in Annex of this guideline. The VaR model approach is available to banks that have received RBI approval for an internal market risk model as per the applicable RBI guidelines Otherwise banks may separately apply for RBI approval to use their internal VaR models for calculation of potential price volatility for repo-style transactions. Internal models will only be accepted when a bank can prove the quality of its model to the RBI through the backtesting of its output using one year of historical data.

31. The quantitative and qualitative criteria for recognition of VaR models for repo style and other similar transactions are in-principle the same to IMA models for

market risk. With regard to the holding period, the minimum will be 5-business days for repo-style transactions, rather than the 10-business days. For other transactions eligible for the VaR models approach, the 10-business day holding period will be retained. The minimum holding period should be adjusted upwards for market instruments where such a holding period would be inappropriate given the liquidity of the instrument concerned. A bank's VaR model used to determine its net exposure (for repo style and SFT) for capital adequacy purpose, must provide daily estimate of 99 per cent, one tailed confidence interval of the potential change in value of the unsecured exposure amount ($\Sigma(E) - \Sigma(C)$).

The calculation of the exposure E* for banks using their internal model will be the following:

$E^* = \max \{0, [(\Sigma E - \Sigma C) + \text{VaR output from internal model}]\}$

In calculating capital requirements banks will use the previous business day's VaR number.

Appendix 4

Credit Risk Mitigation: Disclosure requirements

The disclosure requirement under Pillar 3 for the banks in respect of credit risk mitigation is given below:

Qualitative Disclosures

(a) The general qualitative disclosure requirement with respect to credit risk mitigation including:

- Policies and processes for, and an indication of the extent to which the bank makes use of, on balance sheet netting;
- policies and processes for collateral valuation and management;
- a description of the main types of collateral taken by the bank;
- the main types of guarantor counterparty and their creditworthiness; and information about (market or credit) risk concentrations within the mitigation taken

Quantitative Disclosures

(b) For each separately disclosed credit risk portfolio the total exposure (after, where applicable, on balance sheet netting) that is covered by eligible financial collateral/IRB collaterals after the application of haircuts.

(c) For each separately disclosed credit risk portfolio the total exposure (after, where applicable, on balance sheet netting) that is covered by guarantees/credit derivatives (whenever specifically permitted by RBI).

Appendix 5

Operational Requirements common to Guarantees and credit derivatives

1. The operational requirements applicable to guarantees and credit derivatives are mentioned below:

i) A guarantee (counter-guarantee) or credit derivative (as permitted by the extant RBI guidelines) must represent a direct claim on the protection provider and must be explicitly referenced to specific exposures or a pool of exposures, so that the extent of the cover is clearly defined and incontrovertible. Other than non payment by a protection purchaser of money due in respect of the credit protection contract it must be irrevocable; there must be no clause in the contract that would allow the protection provider unilaterally to cancel the cover or that would increase the effective cost of cover as a result of deteriorating credit quality in the guaranteed/protected exposure. The guarantee must also be unconditional; there should be no clause in the guarantee outside the direct control of the bank that could prevent the protection provider from being obliged to pay out in a timely manner in the event that the original counterparty fails to make the payment(s) due.

ii) Capital requirement for all exposures will be calculated after taking into account risk mitigation available in the form of guarantees. When a guaranteed exposure is classified as non-performing, the guarantee will cease to be a credit risk mitigant and no adjustment would be permissible on account of credit risk mitigation in the form of guarantees. The entire outstanding, net of specific provision and net of realisable value of eligible collaterals / credit risk mitigants, will attract the appropriate risk weight.

Additional Operational Requirements for Guarantees

2. In addition to the legal certainty requirements (that all documentation used in respect of guarantees and credit derivatives must be binding on all parties and legally enforceable in all relevant jurisdictions), in order for a guarantee to be recognised, the following conditions must be satisfied:

i) On the qualifying default / non-payment of the counterparty, the bank is able in a timely manner to pursue the guarantor for any money outstanding under the documentation governing the transaction. The guarantor may make one lump sum payment of all money under such documentation to the bank, or the guarantor may assume the future payment obligations of the counterparty covered by the guarantee. The bank must have the right to receive any such payments from the guarantor without first having to take legal actions in order to pursue the counterparty for payment.

ii) The guarantee is an explicitly documented obligation assumed by the guarantor.

iii) Except as noted in the following sentence, the guarantee covers all types of payments the underlying borrower is expected to make under the documentation governing the transaction, for example notional amount, margin payments etc. Where a guarantee covers payment of principal only, interests and other uncovered payments should be treated as an unsecured amount.

Additional operational requirements for credit derivatives

3. In order for a credit derivative contract to be recognised, the following conditions must be satisfied.

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

- failure to pay the amounts due under terms of the underlying obligation that are in effect at the time of such failure (with a grace period that is closely in line with the grace period in 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).

(ii) If the credit derivative specifies deliverable obligations that are different from the (subject to RBI approval) underlying obligation, section (vii) below governs whether the asset mismatch is permissible.

(iii) The credit derivative shall 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, subject to the provisions of paragraph 64 of the Annex of this guideline.

(iv) Credit derivatives allowing for cash settlement are recognised for capital purposes insofar as a robust valuation process is 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. If the reference obligation specified in the credit derivative for purposes of cash settlement is different than the underlying obligation, section (vii) below governs whether the asset mismatch is permissible.

(v)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.

(vi) 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 seller. The protection buyer must have the right/ability to inform the protection provider of the occurrence of a credit event.

(vii)A mismatch between the underlying obligation and the reference obligation under the credit derivative (i.e. the obligation used for purposes of determining cash settlement value or the deliverable obligation or obligation referred for the purpose of ascertaining the credit events) is permissible if (1) the reference obligation ranks pari passu with or is junior to the underlying obligation, and (2) 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.

Range of Eligible Guarantors (Counter-guarantors)/protection providers for F-IRB banks

4. Credit protection given by the following entities will be recognised:

(i) Sovereigns, sovereign entities (including BIS, IMF, European Central Bank and European Community as well as those MDBs, ECGC and CGFTSI), banks and primary dealers with a lower risk weight than the counterparty;

(ii) Other entities rated AA (-) or better. This would include guarantee cover provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor. The rating of the guarantor should be an entity rating which has factored in all the liabilities and commitments (including guarantees) of the entity.

Sovereign Guarantees and Counter-guarantees

5. A claim may be covered by a guarantee that is indirectly counter-guaranteed by a sovereign. Such a claim may be treated as covered by a sovereign guarantee provided that:

(i) the sovereign counter-guarantee covers all credit risk elements of the claim;

(ii) 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

(iii) the cover should be robust and no historical evidence suggests that the coverage of the counter-guarantee is less than effectively equivalent to that of a direct sovereign guarantee.

After the guarantee has been recognised (as per para 11-12 of the Annex of this guideline) and it is found that guarantee portion does not cover the whole exposure then the unsecured portion will be assigned LGD as per table 1 of para no. 48.

Proportional Cover

6. Where the amount guaranteed, or against which credit protection is held, is less than the amount of the exposure, and the secured and unsecured portions are of equal seniority, i.e. the bank and the guarantor share losses on a pro-rata basis capital relief will be afforded on a proportional basis: i.e. the protected portion of the exposure will receive the treatment applicable to eligible guarantees, with the remainder treated as unsecured.

Tranched cover

7. Where the bank transfers a portion of the risk of an exposure in one or more tranches to a protection seller and retains some level of risk of the loan and the risk transferred and the risk retained are of different seniority, banks must obtain credit protection for either of the senior tranches or the junior tranches. In this case Securitisation rule will apply.

Appendix 6

Credit Conversion Factors (CCFs) for non market related Off Balance sheet items for EAD calculation

1. Credit Conversion factors (CCFs) for non-market related off balance sheet items for EAD calculation are tabulated below:

Credit Conversion Factors - Non-market related Off-balance Sheet Items		
Sr. No.	***Instruments***	***Credit Conversion Factor (%)***
1.	Direct credit substitutes e.g. general guarantees of indebtedness (including standby L/Cs serving as financial guarantees for loans and securities, credit enhancements, liquidity facilities for securitisation transactions), and acceptances (including endorsements with the character of acceptance). (i.e., the risk of loss depends on the credit worthiness of the counterparty or the party against whom a potential claim is acquired)	100
2.	Certain transaction-related contingent items (e.g. performance bonds, bid bonds, warranties, indemnities and standby letters of credit related to particular transaction).	50
3.	Short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralised by the underlying shipment) for both issuing bank and confirming bank.	20
4.	Sale and repurchase agreement and asset sales with recourse, where the credit risk remains with the bank.	100
5.	Forward asset purchases, forward deposits and partly paid shares and securities, which represent commitments with certain drawdown.	100
6	Lending of banks' securities or posting of securities as collateral by banks, including instances where these arise out of repo style transactions (i.e., repurchase / reverse	100

	repurchase and securities lending / securities borrowing transactions)		
7.	Commitments with certain drawdown		100
8.	Note Issuance facilities and revolving/non revolving underwriting facilities		75%
9.	Other commitments (e.g., formal standby facilities and credit lines) , irrespective of the maturity		75%
	Similar commitments that are unconditionally cancellable at any time by the bank without prior notice or that effectively provide for automatic cancellation due to deterioration in a borrower's credit worthiness. For this banks must 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.		0
10.	Take-out Finance in the books of taking-over institution		
	(i)	Unconditional take-out finance	100
	(ii)	Conditional take-out finance	50
11.	Irrevocable payment commitments(IPCs)@		100

@ Irrevocable payment commitments should be treated as equity exposures.

2. In regard to non-market related off-balance sheet items, the following transactions with non-bank counterparties will be treated as claims on banks:

* Guarantees issued by banks against the counter guarantees of other banks.

* Rediscounting of documentary bills discounted by other banks and bills discounted by banks which have been accepted by another bank will be treated as a funded claim on a bank.

In the above cases banks should be fully satisfied that the risk exposure is in fact on the other bank.

Appendix 7

Calculation of EAD for market related off balance sheet items

The methodology for calculation of EAD for market related off balance sheet items is discussed in this Appendix.

Transactions involving Central Counterparties

1. The exposures to Central Counter Parties (CCPs), on account of derivatives trading and securities financing transactions (e.g. Collateralised Borrowing and Lending Obligations, Repos, Reverse Repos) outstanding against them will be assigned zero exposure value for counterparty credit risk, as it is presumed that the CCPs' exposures to their counterparties are fully collateralised on a daily basis, thereby providing protection for the CCP's credit risk exposures.

2. Banks' securities posted as collaterals with CCPs and the resultant off-balance sheet exposure will be assigned risk weights as per the standardised approach appropriate to the nature of the CCPs and will be subject to review.

Market related off balance sheet transactions not involving CCPs

3. The credit equivalent amount of a market related off-balance sheet item, whether held in the banking book or trading book must be determined by the current exposure method.

Current Exposure Method

4. The calculation methodology of the credit equivalent amount under Current Exposure Method is mentioned below

(i) The credit equivalent amount of a market related off-balance sheet transaction calculated using the current exposure method is the sum of current credit exposure and potential future credit exposure of these contracts. While computing the credit exposure banks may exclude 'sold options', provided the entire premium / fee or any other form of income is received / realised.

(ii) Current credit exposure is defined as the sum of the positive mark-to-market value of these contracts. The Current Exposure Method requires periodical calculation of the current credit exposure by marking these contracts to market, thus capturing the current credit exposure.

(iv) Potential future credit exposure is determined by multiplying the notional principal amount of each of these contracts irrespective of whether the contract has a zero, positive or negative mark-to-market value by the relevant add-on (credit conversion) factor indicated below according to the nature and residual maturity of the instrument.

Credit Conversion Factors for Market-related Off-balance Sheet Items		
	Credit Conversion Factors	
	Interest Rate Contracts	Exchange Rate Contracts & Gold
One year or less	0.50 %	2.00 %
Over one year to five years	1.00 %	10.00 %
Over five years	3.00 %	15.00 %

(iv) For contracts with multiple exchanges of principal, the add-on/credit conversion factors are to be multiplied by the number of remaining payments in the contract.

(v) For contracts that are structured to settle outstanding exposure following specified payment dates and where the terms are reset such that the market value of the contract is zero on these specified dates (for ex- Interest Rate Swap), the residual maturity would be set equal to the time until the next reset date. However, in the case of interest rate contracts which have residual maturities of more than one year and meet the above criteria, the CCF or add-on factor is subject to a floor of 1.0 per cent.

(vi) No potential future credit exposure would be calculated for single currency floating / floating interest rate swaps; the credit exposure on these contracts would be evaluated solely on the basis of their mark-to-market value.

(vii) Potential future exposures should be based on effective rather than apparent notional amounts. In the event that the stated notional amount is leveraged or enhanced by the structure of the transaction, banks must use the effective notional amount when determining potential future exposure. For example, a stated notional amount of Rs. 10 lakh with payments based on an internal rate of two times the ‘base rate’ would have an effective notional amount of Rs. 20 lakh.

Failed Transactions

5. The treatment for failed transactions is mentioned below:

i) With regard to unsettled securities and foreign exchange transactions, banks are exposed to counterparty credit risk from trade date, irrespective of the booking or the accounting of the transaction. Banks are encouraged to develop, implement and improve systems for tracking and monitoring the credit risk exposure arising from unsettled transactions as appropriate for producing management information that facilitates action on a timely basis.

ii) Banks must closely monitor securities and foreign exchange transactions that have failed, starting from the day they fail for producing management information that facilitates action on a timely basis. Failed transactions give rise to risk of delayed settlement or delivery.

iii) Failure of transactions settled through a delivery-versus-payment system (DvP), providing simultaneous exchanges of securities for cash, expose banks to a risk of loss on the difference between the transaction valued at the agreed settlement price and the transaction valued at current market price (i.e. positive current exposure). Failed transactions where cash is paid without receipt of the corresponding receivable (securities, foreign currencies, or gold,) or, conversely, deliverables were delivered without receipt of the corresponding cash payment (non-DvP, or free-delivery) expose banks to a risk of loss on the full amount of cash paid or deliverables delivered. Therefore, a capital charge is required for failed transactions and must be calculated. The following capital treatment is applicable to all failed transactions, including transactions through recognised clearing houses. Repurchase and reverse-repurchase agreements as well as securities lending and borrowing that have failed to settle are excluded from this capital treatment.

iv) For DvP Transactions - If the payments have not yet taken place five business days after the settlement date, banks are required to calculate a capital charge by multiplying the positive current exposure of the transaction by the appropriate factor as under. In order to capture the information, banks will need to upgrade their information systems in order to track the number of days after the agreed settlement date and calculate the corresponding capital charge.

Number of Working Days After the Agreed Settlement Date	Corresponding Risk Multiplier (in per cent)
From 5 to 15	9
From 16 to 30	50
From 31 to 45	75
46 or more	100

v) For non-DvP transactions (free deliveries) after the first contractual payment / delivery leg, the bank that has made the payment will treat its exposure as a loan if the second leg has not been received by the end of the business day. If the dates

when two payment legs are made are the same according to the time zones where each payment is made, it is deemed that they are settled on the same day. For example, if a bank in Tokyo transfers Yen on day X (Japan Standard Time) and receives corresponding US Dollar via CHIPS on day X (US Eastern Standard Time), the settlement is deemed to take place on the same value date. Banks shall compute the capital requirement using the counterparty risk weights prescribed in these guidelines. However, if five business days after the second contractual payment / delivery date the second leg has not yet effectively taken place, the bank that has made the first payment leg will apply 1111% risk weight to the full amount of the value transferred plus replacement cost, if any. This treatment will apply until the second payment / delivery leg is effectively made.

Appendix 8

Minimum requirements under Advanced IRB approach for banks' own EAD calculation

Minimum requirements to be met by the banks to calculate own estimate of EAD under advanced IRB approach are given below.

Standards for all asset classes

1. For on-balance sheet items, banks must estimate EAD at no less than the current drawn amount, subject to recognising the effects of on-balance sheet netting as specified in para 87 of the Annex of this guideline. The minimum requirements for the recognition of netting are the same as those under the foundation approach. The additional minimum requirements for internal estimation of EAD under the advanced approach focus on the estimation of EAD for off-balance sheet items (excluding transactions that expose banks to counterparty credit risk). Advanced IRB banks must have established procedures in place for the estimation of EAD for off-balance sheet items. These must specify the estimates of EAD to be used for each facility type. Banks estimates of EAD should reflect the possibility of additional drawings by the borrower up to and after the time a default event is triggered. Where estimates of EAD differ by facility type, the delineation of these facilities must be clear and unambiguous.

2. Advanced IRB banks must assign an estimate of EAD for each facility. It must be an estimate of the long-run default-weighted average EAD for similar facilities and borrowers over a sufficiently long period of time, but with a margin of conservatism appropriate to the likely range of errors in the estimate. If a positive correlation can reasonably be expected between the default frequency and the magnitude of EAD, the EAD estimate must incorporate a larger margin of conservatism. Moreover, for exposures for which EAD estimates are volatile over the economic cycle, the bank must use EAD estimates that are appropriate for an economic downturn, if these are more conservative than the long run average. For banks that have been able to develop their own EAD models, this could be achieved by considering the cyclical nature, if any, of the drivers of such models. Other banks may have sufficient internal

data to examine the impact of previous recession(s). However, some banks may only have the option of making conservative use of external data.

3. The criteria by which estimates of EAD are derived must be plausible and intuitive, and represent what the bank believes to be the material drivers of EAD. The choices must be supported by credible internal analysis by the bank. The bank must be able to provide a breakdown of its EAD experience by the factors it sees as the drivers of EAD. A bank must use all relevant and material information in its derivation of EAD estimates. Across facility types, a bank must review its estimates of EAD when material new information comes to light and at least on an annual basis.

4. Due consideration must be paid by the bank to its specific policies and strategies adopted in respect of account monitoring and payment processing. The bank must also consider its ability and willingness to prevent further drawings in circumstances short of payment default, such as covenant violations or other technical default events. Banks must also have adequate systems and procedures in place to monitor facility amounts, current outstanding against committed lines and changes in outstanding per borrower and per grade. The bank must be able to monitor outstanding balances on a daily basis.

Additional standards for corporate, sovereign, and bank exposures

5. Estimates of EAD must be based on a time period that must ideally cover a complete economic cycle but must in any case be no shorter than a period of seven years. If the available observation period spans a longer period for any source, and the data are relevant, this longer period must be used. EAD estimates must be calculated using a default weighted average and not a time-weighted average.

Appendix-9

Supervisory Slotting criteria for Specialised lending

Table 1- Supervisory rating grades for Project Finance Exposure

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

Financial structure Duration of the credit compared to the duration of the project Amortisation schedule	Useful life of the project Significantly exceeds tenor of the loan Amortising debt	Useful life of the project exceeds tenor of the loan Amortising debt	Useful life of the project exceeds tenor of the loan Amortising debt repayments with limited bullet payment	Useful life of the project may not exceed tenor of the loan Bullet repayment or amortising debt repayments with high bullet repayment
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	Strong	Satisfactory	Fair	Weak

content laws				
Enforceability of contract, 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.
Transaction characteristic				
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
Construction risk Status of permits Type of construction contract	 All permits have been Obtained Fixed-price date-certain turnkey construction EPC (engineering and procurement contract)	 Some permits are still outstanding but their receipt is considered very likely Fixed-price date-certain turnkey construction EPC	 Some permits are still outstanding but the permitting process is well defined and they are considered routine Fixed-price date-certain turnkey construction contract with one or several contractors	 Key permits still need to be obtained and are not considered routine. Significant conditions may be attached 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
Off-take risk (a) If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of offtaker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt	Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt	Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt	Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt
(b) if there is no take-or-pay or fixed-price off-take contract:	Project produces essential services or a commodity sold widely on a world market; output can readily be absorbed at projected prices even at lower than historic market growth rates	Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates	Commodity is sold on a limited market that may absorb it only at lower than projected prices	Project output is demanded by only one or a few buyers or is not generally sold on an organised market

Supply risk Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength Reserve risks (e.g. natural resource development)	Long-term supply contract with supplier of excellent financial standing Independently audited, proven and developed reserves well in excess of requirements over lifetime of the project	Long-term supply contract with supplier of good financial standing Independently audited, proven and developed reserves in excess of requirements over lifetime of the project	Long-term supply contract with supplier of good financial standing — a degree of price risk may remain Proven reserves can supply the project adequately through the maturity of the debt	Short-term supply contract or long-term supply contract with financially weak supplier — a degree of price risk definitely remains Project relies to some extent on potential and undeveloped reserves
Strength of the sponsor				
Sponsor's track record, financial strength, and country / sector experience Sponsor support, as evidenced by equity, owner-ship clause and incentive to inject additional cash if necessary	Strong sponsor with excellent track record and high financial standing Strong. Project is highly strategic for the sponsor (core business — long-term strategy)	Good sponsor with satisfactory track record and good financial standing Good. Project is strategic for the sponsor (core business — long-term strategy)	Adequate sponsor with adequate track record and good financial standing Acceptable. Project is considered important for the sponsor (core business)	Weak sponsor with no or questionable track record and / or financial weaknesses Limited. Project is not key to sponsor's long-term strategy or core business
Security Package				
Assignment of contracts and Accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
Pledge of assets, taking into account	First perfected security interest in all project assets,	Perfected security interest in all project assets, contracts,	Acceptable security interest in all project assets, contracts,	Little security or collateral for lenders; weak negative

quality, value and liquidity of assets	contracts, permits and accounts necessary to run the project	permits and accounts necessary to run the project	permits and accounts necessary to run the project	pledge clause
Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak
Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions…)	Covenant package is strong for this type of project Project may issue no additional debt	Covenant package is satisfactory for this type of project Project may issue extremely limited additional debt	Covenant package is fair for this type of project Project may issue limited additional debt	Covenant package is Insufficient for this type of project Project may issue unlimited additional debt
Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc)	Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank	Average coverage period, all reserve funds fully funded	Covenant package is fair for this type of project. Project may issue limited additional debt	Shorter than average coverage period, reserve funds funded from operating cash flows

Table-2 Supervisory rating grades for IPRE/CRE exposures

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

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

	tenants desire	tenants desire		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
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	Appropriate management and sponsors' quality. The sponsor or management has	Moderate management and sponsors' quality. Management or sponsor track	Ineffective management and substandard sponsors' quality. Management and

	lengthy and successful record with similar properties	a successful record with similar properties	record does not raise serious concerns	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
Security Package				
Nature of lien	Perfected first lien	Perfected first lien	Perfected first lien	Ability of lender to foreclose is constrained
Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providingnotice 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

Table-3 Supervisory rating grades for Object Finance Exposure

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

risks	repossession and enforcement of contracts	repossession and enforcement of contracts	favourable to repossession and enforcement of contracts, even if repossession might be long and/or difficult	regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible
Transaction characteristics				
Financing term compared to the economic life of the asset	Full payout profile/minimum balloon. No grace period	Balloon more significant, but still at satisfactory levels	Important balloon with potentially grace periods	Repayment in fine or high Balloon
Operating risk				
Permits / licensing	All permits have been obtained; asset meets current and foreseeable safety regulations	All permits obtained or in the process of being obtained; asset meets current and foreseeable safety regulations	Most permits obtained or in process of being obtained, outstanding ones considered routine, asset meets current safety regulations	Problems in obtaining all required permits, part of the planned configuration and/ or planned operations might need to be revised
Scope and nature of O & M (Operation and Maintenance) contracts overruns beyond mitigants	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 offlease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset

Asset characteristics				
Configuration, size, design and maintenance (i.e. age, size for a plane) compared to other assets on the same market	Strong advantage in design and maintenance. Configuration is standard such that the object meets a liquid market	Above average design and maintenance. Standard configuration, maybe with very limited exceptions — such that the object meets a liquid market	Average design and maintenance. Configuration is somewhat specific, and thus might cause a narrower 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
Strength of sponsor				
Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes offlease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to remarket the asset
Sponsors' track record and financial strength	Sponsors with excellent track record and high financial standing	Sponsors with good track record and good financial standing	Sponsors with adequate track record and good financial standing	Sponsors with no or questionable track record and / or financial weaknesses
Security Package				
Asset control	Legal documentation	Legal documentation	Legal documentation	The contract provides little

	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	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	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	security to the lender and leaves room to some risk of losing control on the asset
Rights and means at the lender's disposal to monitor the location and condition of the asset	The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections)	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset are limited
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-4 Supervisory rating grades for Commodity Finance

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

Strength of sponsor				
Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak
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 monitoring	Strong standards for counterparty selection, hedging, and	Adequate standards for counterparty selection, hedging, and monitoring	Past deals have experienced no or minor problems	Trader has experienced significant losses on past deals
Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
Security package				
Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed	First perfected security interest provides the lender legal control of the assets at any time if needed	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be.	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardised
Insurance against damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Appendix 10

Purchased Receivables

The treatment of Purchased Receivables under the foundation and advanced IRB approach is discussed below.

1. This treatment for calculating capital requirements for unexpected loss will be applicable in cases where the bank has purchased receivables from other institutions (may be in the form of assignments as well). Ascertaining capital requirement for corporate purchased receivables will not be allowed under the advanced IRB approach if the bank is using Foundation IRB approach for corporate exposures.

2. Before discussing purchased receivables, two conceptual approaches need to be understood;

- Bottom up approach: This is the more common approach to measure the risk weighted assets of the banks' exposure to the corporate receivables. In this case, receivables can be identified on an individual borrower (those who actually will service the repayments) basis and treatment can be same like normal corporate exposure.
- Top down approach: This approach is applied when the receivables purchased from other entities are not treated individually but considered to be a part of the pool and risk weighted asset of the pool as a whole is calculated subject to certain conditions which will be discussed below in para 4.

3. Risk weighted asset for purchased corporate receivables as per the Bottom up approach, is similar to the method followed to find out the risk weighted asset for other corporate exposures. The top down approach may be used, provided that the purchasing bank's programme for corporate receivables complies with both the criteria for eligible receivables and the minimum operational requirements of this approach as given in this Appendix and also in para 97 of Appendix 1. Use of the top down approach towards purchased receivables is limited to situations where it would be an undue burden on a bank to be subjected to the minimum requirements for the IRB approach to usual corporate exposures that would otherwise apply.

4. The top down approach can be used subject to obtaining permission from RBI. RBI may deny the use of the top down approach for purchased corporate receivables depending on the bank's compliance with minimum requirements as given in this appendix**.** In particular, to be eligible for the proposed 'top down' treatment, purchased corporate receivables must satisfy the following conditions:

- The receivables are purchased from unrelated, third party sellers, and as such the bank has not originated the receivables either directly or indirectly.

- The receivables must be generated on an arm's-length basis between the seller and the obligor. (as such, intercompany accounts receivable and receivables subject to contra-accounts between firms that buy and sell to each other are ineligible.)

- The purchasing bank has a claim on all proceeds from the pool of receivables or a *pro-rata* interest in the proceeds commensurate with its exposure to the pool.

- Concentration limit above which the capital charges must be calculated using the minimum requirements for the bottom-up approach will be in terms of size of individual exposure (maximum 1% of the total pool) or as conveyed to the banks as and when considered necessary)

- The existence of full or partial recourse to the seller of the receivables does not automatically disqualify a bank from adopting this top down approach, as long as the cash flows from the purchased corporate receivables are the primary protection against default risk.

Calculation of Capital Requirements for Default Risk of corporate purchased receivables, using the top down approach

5. The treatment for Top down approach under foundation and advanced IRB methods are mentioned below. A bank will be allowed to use IRB approaches for purchased corporate receivables only if it is allowed by the RBI to use IRB approaches for normal corporate exposures.

6. Under both the foundation and advanced methods, a bank should group the qualifying purchased receivables into sufficiently homogeneous pools so that accurate and consistent estimates of PD and LGD (or expected long run average loss rate) for default losses and estimates of expected long run average loss rate for dilution losses can be determined. For this purpose the grouping should reflect the

underwriting practices and the heterogeneity of the customers of the corporate from which the receivables have been bought. The purchasing bank must determine whether the data provided by the seller are consistent with expectations agreed upon by both parties concerning, for example, the type, volume and on-going quality of receivables purchased. Where this is not the case, the purchasing bank is expected to obtain and rely upon more relevant data.

Foundation IRB approach

7. There may be cases where a bank is not able to calculate reliable estimate PD for the segmented pools of purchased receivables and there may also be cases where the bank is able to do so. Treatment under each of these situations are described below

8. Where a bank is unable to reliably estimate PD for the segmented pools of purchased corporate receivables, it must estimate the expected long run average loss rate (EL) for each of the homogeneous segmented pool (The expected long-run average loss rate must be a bank's estimate of the segmented pools' long-run average annual loss rate for default risk where the loss rate is expressed as a percentage of the exposure amount (i.e. the total EAD owed to the bank by all borrowers in the segmented pool of receivables)). The expected long-run average loss rate must be calculated for the receivables on a stand-alone basis i.e. without regard to any assumption of recourse or guarantee from the seller or other parties.

9. There may be instances where the bank is not able to decompose the EL into reliable estimates of PD and LGD and there may be cases where the bank is able to do the decomposition properly. The risk components to be used; in cases where the bank is unable to decompose EL into PD and LGD; to arrive at the capital requirement for default risk is mentioned below:

(i) (a) If the bank is unable to decompose its EL estimate into its PD and LGD components in a reliable manner, but it is able to demonstrate that the exposures are exclusively senior claims to corporate borrowers, it should determine PD, LGD and EAD as follows:

- LGD = 0.65 and hence;
- PD = EL(expected long run average loss rate)/LGD; and
- EAD = (Outstanding amount for each segmented pool) – (Capital charge for dilution risk (discussed subsequently) prior to credit risk mitigation)

After determining the risk components as mentioned above, the capital requirement is found by using the same formula as used for usual corporate exposure in equation (A) of para115 of the Annex.

(i) (b) If the bank is unable to decompose its EL estimate into its PD and LGD components in a reliable manner, and it is unable to demonstrate that the exposures are exclusively senior claims to corporate borrowers, it should determine PD, LGD and EAD as follows:

- LGD = 1.00;
- PD = EL(expected long run average loss rate); and
- EAD = (Outstanding amount for each segmented pool) – (Capital charge for dilution risk prior to credit risk mitigation)

10. However, EAD for a revolving purchase facility (e.g. credit card receivables) will be;

EAD= {Current amount of the receivables purchased + 0.75 of the undrawn purchase commitments – capital for Dilution Risk prior to credit risk mitigation}.

11. On the other hand, if the purchasing bank is able to estimate PD in a reliable manner, the risk weight is determined from the corporate risk weight functions according to the specifications of LGD, M and the treatment of guarantees under the Foundation Approach.

12. Maturity (M) for drawn amounts will equal the segmented pools' exposure-weighted average effective maturity. This same value of M will also be used for any undrawn amounts to which the bank is committed under a purchased receivables facility, provided that the facility contains covenants, or other features that protect the purchasing bank against a significant deterioration in the quality of the future receivables it is required to purchase over the facility's term. In the absence of such protection, the M for undrawn amounts will be calculated as the sum of:

(a) the longest-dated potential receivable under the purchase agreement; and

(b) the remaining maturity of the purchase facility.

Advanced IRB approach

13. Under the advanced approach, a bank must estimate PD and LGD for each of the homogeneous segmented pools of purchased corporate receivables.

14. Where a bank can only reliably estimate one of either the default-weighted average LGD or average PD for each segmented pool, the bank may estimate the other required credit risk component based on its estimate of the expected long-run average loss rate (PD= EL/LGD or LGD=EL/PD) of the segmented pool. In either case, the LGD should not be less than the long-run default-weighted average LGD and the bank must be considering the facts that

- LGD estimate must reflect economic downturn conditions to capture relevant risk
- There may be significant cyclical variability in loss severities of certain exposures

EAD and M estimates under the advanced approach for purchased corporate receivables are the same as those in the foundation approach as discussed above.

Calculation of capital requirement for Dilution risk

15. Dilution refers to the possibility that the receivable amount is reduced through cash or non-cash credit to the receivable's obligor. Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the borrower to a receivables obligor and any payment or promotional discounts offered by the borrower (e.g. a credit for cash payments within 30 days)

16. Unless a purchasing bank can demonstrate to RBI that dilution risk is immaterial, a capital requirement for dilution risk is required for purchased corporate receivables.

17. For the purposes of calculating the capital requirement for dilution risk for either segmented pools or individual receivables making up a pool, a purchasing bank must estimate the expected long-run average annual loss rate for dilution risk; expressed in percentage of the receivables amount in the respective pools.

18. A bank may utilise internal or external reference data to estimate an expected long-run average annual loss rate for dilution risk. However, these estimates must be calculated on a stand-alone basis without regard to any assumption of recourse or guarantees from the seller or other parties.

19. For the purpose of calculating the capital requirement for dilution risk, the corporate IRB risk-weight function must be used, with PD set equal to the estimate of the expected long-run average annual loss rate and LGD set to 100 per cent. So the values of PD and LGD should accordingly be put in equation (A) in para115 to find the capital requirement for Dilution Risk.

20. An appropriate maturity must be used when determining the capital requirement for dilution risk as per the paras 107-109 of the Annex. If the bank can demonstrate to RBI that dilution risk is appropriately monitored and managed so as to be resolved within one year of acquisition of the purchased receivables, RBI may grant an approval allowing the bank to base its calculations on a one-year maturity assumption.

Purchase price discounts and first loss protection

21. Where a portion of any purchase price discount is refundable by the obligor to the seller of the receivables, the refundable amount must be treated as first loss protection under IRB securitisation framework. Non refundable purchase price discounts for purchased receivables do not affect the regulatory capital calculation.

22. When collateral or partial guarantees obtained on purchased receivables provide first loss protection covering default losses, dilution losses, or both, they must be recognised as first loss protection under IRB securitisation framework.

Recognition of guarantees

23. Guarantees for purchased receivables are recognised in the same manner as other guarantees under the IRB approach. The IRB rules for guarantees may be applied to guarantees provided by the seller or a third party regardless of whether the guarantee covers default risk, dilution risk or both.

24. If the guarantee covers a pool's default risk and dilution risk, the bank may substitute the risk-weight for an exposure to the guarantor in place of the relevant pool's total risk-weight for default and dilution risks.

25. If the guarantee covers only one of the default risk or dilution risk, the bank may substitute the risk-weight for an exposure to the guarantor in place of the relevant pool's risk-weight for the corresponding risk component. The capital requirement for the non-guaranteed component must then be added.

26. If a guarantee covers only a portion of the default or dilution risk of a relevant pool, the uncovered portion must be treated as per the existing CRM rules for proportional or tranched coverage (i.e. the risk weight of the uncovered risk components will be added to the risk weights of the covered risk components).

27. If the guarantee provides protection against dilution risk and the conditions and operational requirements for recognition of double default (para 126 of the Annex) are satisfied, the double default framework may be used by the bank for the calculation of the risk-weighted asset amount for dilution risk. In this case, the capital charge is the same as that detailed in paragraph 124 of the Annex with PD_0 being equal to the bank's estimated EL, LGD_g being equal to 100 per cent and maturity determined in accordance with the procedure for calculation of capital charge for dilution risk as mentioned above.

Treatment of Purchased Retail Receivables

28. Purchased retail receivables will be subjected to IRB capital charges for both default risk and if applicable; dilution risk. The underlying receivables should meet

the qualification requirements for retail assets as given in para 132 of this circular. The calculation of unexpected losses (UL) capital requirement will be as provided in the following paras:

Computation of Risk weighted assets for default risk

Receivables belonging to single retail assets class

29. If the receivables belong to a single retail sub-asset class (e.g. retail exposure secured by residential properties, Qualifying revolving retail exposure and other retail exposures), the risk weight may be calculated as per the treatment applicable to that retail sub-asset class and the respective risk weight function and correlation factor may be used. The receivables should have the same standards and qualification requirement as prescribed for that retail asset sub group. The receivables should be segmented into homogeneous pools and estimates of PD & LGD may be calculated on a standalone basis without any assumption of recourse or guarantees from seller or other parties.

Receivables belonging to more than one retail asset subclass (hybrid pools)

30. For purchased receivables containing pools of retail assets belonging to more than one retail sub-asset class, the purchasing bank should try to separate the exposure by type of retail sub-asset class and use the risk weight function (given at para 148 of the Annex of this guideline) accordingly. However, if the purchasing bank is not able to separate the purchased receivables, the risk weight function that produces the highest capital requirement for the exposure types in the receivables pool should be used.

Computation of Risk weighted assets for dilution risk

31. Dilution refers to the possibility that the receivable amount is reduced through cash or non cash credits such as return of goods sold, offsets due to disputes regarding product quality or promotional discounts. Unless a bank can demonstrate successfully that there is insignificant impact of dilution risk, it must provide capital for dilution risk.

32. The purchasing bank should estimate the expected long run average annual loss rate for dilution risk. The expected long run average loss rate is defined as a percentage of the exposure amount i.e. the total EAD owed to the bank by all borrowers in the relevant pool of receivables. The loss rate may be calculated for each homogeneous segment of receivables or at the level of individual receivables constituting the pool. The bank may utilise internal or external reference data to calculate the loss rate.

33. The capital may be calculated using the corporate IRB function with PD equal to EL and LGD equal to 100 per cent. An appropriate maturity must be used when determining the capital requirement and the minimum maturity may be one year where the bank has successfully demonstrated that the dilution risk is appropriately monitored and managed so as to resolve it within one year of acquisition pf the purchased receivables.

34. When a portion of any purchase price discount is refundable to the seller, the refundable amount must be treated as first loss protection under the IRB securitisation framework. Non refundable purchased price discounts for purchased receivables do not affect the regulatory capital calculation. When collateral or partial guarantees obtained on purchased receivables provide first loss protection for default risk or dilution risk or both they must be recognised as first loss protection under the IRB securitisation framework.

Risk mitigation for purchased retail receivables

35. Credit risk mitigants and guarantees will be recognised generally using the same frame work as given in the IRB framework for corporate exposures. Guarantees may be provided by seller or third party and will be treated under the existing IRB framework. Further, for guarantees, following rules will also apply:

- If the guarantee covers default and dilution risk, the bank will substitute the risk weight for an exposure to the guarantor in place of the pool's total risk weight for default and dilution risk.

- If the guarantee is only for default risk or dilution risk, the banks may substitute the risk weight for an exposure to the guarantor only for that risk component.

- If a guarantee covers only a portion of default and/or dilution risk, the proportional risk weight for uncovered portion will be added to the risk weight for covered portion.

36. When the protection against dilution risk has been purchased, the double default framework may be used for the calculation of the proportional risk weighted asset component for dilution risk, subject to the fulfilment of conditions mentioned in the IRB risk framework for use of Double Default framework. PD, LGD and appropriate maturity should be as per para 19 of this appendix and the risk weight function mentioned in the corporate IRB framework for use of Double Default approach should be utilised for calculation of capital.

Appendix 11

Pillar 3 disclosures

To be compliant with IRB requirements, the banks are required to disclose certain additional information under Pillar 3. The supplementary disclosure requirements for this purpose have been given below. In this regard, banks may be guided by the extant RBI guidelines on Market Discipline under Basel II.

Table 1

Disclosure on capital adequacy

Quantitative disclosure	(a)	Capital requirements for credit risk: Portfolios subject to the IRB approaches, disclosed separately for each portfolio (1) Corporate (including SL exposures), sovereign, bank (2) Residential mortgage (3) Qualifying revolving retail (4) Other retail (5) Others (6) Securitisation exposures
	(b)	Capital requirement for equity exposures in the IRB approach: • Equity portfolio subject to market based approach (1) Equity portfolio subject to simple risk weight method (2) Equities in the banking book under internal models method (if banks are using IMA for market risk) • Equity portfolio under PD/LGD approach

Table 2[1]

Credit risk: general disclosures requirements

Qualitative Disclosures	(a)	The general qualitative disclosure requirement with respect to credit risk, including: • Description of approaches followed and statistical methods used; and • For banks that have partly, but not fully adopted either the foundation IRB or the advanced IRB approach, a description of the nature of exposures within each portfolio that are subject to the 1) standardised, 2) foundation IRB, and 3) advanced IRB approaches and of management's plans and timing for migrating exposures to full implementation of the applicable approach.
Quantitative Disclosures	(b)	For each portfolio, the amount of exposures (for IRB banks, drawn plus EAD on undrawn) subject to the 1) standardised, 2) foundation IRB, and 3) advanced IRB approaches.

[1] Table 2 does not include equities.

Table 3

Credit risk: disclosures for portfolios subject to the supervisory risk weights in the IRB approaches

Quantitative Disclosures	(a)	• For exposures subject to the supervisory risk weights in IRB (any SL products subject to supervisory slotting criteria, exposures which are permitted by RBI to be under standardised approach, and equities under the simple risk weight method), the aggregate amount of a bank's outstandings in each risk bucket.

Table 4

Credit risk: disclosures for portfolios subject to IRB approaches

Qualitative Disclosures	(a)	RBI's acceptance of approach/ RBI approved transition
	(b)	Explanation and review of the: • Structure of internal rating systems and relation between internal and external ratings, if applicable; • use of internal estimates other than for IRB capital purposes; • process for managing and recognising credit risk mitigation; and • Control mechanisms for the rating system including discussion of independence, accountability, and rating systems review.
	(c)	Description of the internal ratings process, provided separately for five distinct portfolios: • Corporate (including SMEs, specialised lending and purchased corporate receivables), sovereign and bank; • Equities;[1] • Residential mortgages; • Qualifying revolving retail;[2] and • Other retail. The description should include, for each portfolio: • The types of exposure included in the portfolio; • The definitions, methods and data for estimation and validation of PD, and (for portfolios subject to the IRB advanced approach) LGD and/or EAD, including assumptions employed in the derivation of these variables;[3] and • Description of deviations as permitted under paragraph 74-80 of Appendix 1 from the reference definition of default where determined to be material, including the broad segments of the portfolio(s) affected by such deviations.[4]
Quantitative Disclosures: risk assessment	(d)	For each portfolio (as defined above) except retail, present the following information across a sufficient number of PD grades (including default) to allow for a meaningful differentiation of credit risk:[5] • Total exposures (for corporate, sovereign and bank, outstanding loans and EAD on undrawn commitments;[6] for equities, outstanding amount); • For banks on the IRB advanced approach, exposure-weighted average LGD (percentage); and

		• Exposure-weighted average risk-weight. For banks on the IRB advanced approach, amount of undrawn commitments and exposure-weighted average EAD for each portfolio;[7] For each retail portfolio (as defined above), either:[8] • Disclosures as outlined above on a pool basis (i.e. same as for non-retail portfolios); or • Analysis of exposures on a pool basis (outstanding loans and EAD on commitments) against a sufficient number of EL grades to allow for a meaningful differentiation of credit risk.
Quantitative disclosures: historical results	(e)	Actual losses (e.g. charge-offs and specific provisions) in the preceding period for each portfolio (as defined above) and how this differs from past experience. A discussion of the factors that impacted on the loss experience in the preceding period — for example, has the bank experienced higher than average default rates, or higher than average LGDs and EADs.
	(f)	Banks' estimates against actual outcomes over a longer period.[9] At a minimum, this should include information on estimates of losses against actual losses in each portfolio (as defined above) over a period sufficient to allow for a meaningful assessment of the performance of the internal rating processes for each portfolio. Where appropriate, banks should further decompose this to provide analysis of PD and, for banks on the advanced IRB approach, LGD and EAD outcomes against estimates provided in the quantitative risk assessment disclosures above.[10]

[1] Equities need only be disclosed here as a separate portfolio where the bank uses the PD/LGD approach for equities held in the banking book.

[2] In both the qualitative disclosures and quantitative disclosures that follow, banks should distinguish between the qualifying revolving retail exposures and other retail exposures unless these portfolios are insignificant in size (relative to overall credit exposures) and the risk profile of each portfolio is sufficiently similar such that separate disclosure would not help users' understanding of the risk profile of the banks' retail business.

[3] This disclosure does not require a detailed description of the model in full. It should provide the reader with a broad overview of the model approach, describing definitions of the variables, and methods for estimating and validating those variables set out in the quantitative risk disclosures below. This should be done for each of the five portfolios. Banks should draw out any significant differences in approach to estimating these variables within each portfolio.

[4] This is to provide the reader with context for the quantitative disclosures that follow. Banks need only to describe main areas where there has been material divergence from the reference definition of default such that it would affect the readers' ability to compare and understand the disclosure of exposures by PD grade.

[5] The PD, LGD and EAD disclosures here should reflect the effects of collateral, netting and guarantees/credit derivatives, where recognised as per this guideline. Disclosure of each PD grade should include the exposure weighted-average PD for each grade. Where banks are aggregating PD

grades for the purposes of disclosure, this should be a representative breakdown of the distribution of PD grades used in the IRB approach.

[6] Outstanding loans and EAD on undrawn commitments can be presented on a combined basis for these disclosures.

[7] Banks need only to provide one estimate of EAD for each portfolio. However, where banks believe it is helpful, in order to give a more meaningful assessment of risk, they may also disclose EAD estimates across a number of EAD categories, against the undrawn exposures to which these relate.

[8] Banks would normally be expected to follow the disclosures provided for the non-retail portfolios. However, banks may choose to adopt EL grades as the basis of disclosure where they believe this can provide the reader with a meaningful differentiation of credit risk. Where banks are aggregating internal grades (either PD/LGD or EL) for the purposes of disclosure, this should be a representative breakdown of the distribution of those grades used in the IRB approach.

[9] These disclosures are a way of further informing the reader about the reliability of the information provided in the “quantitative disclosures: risk assessment” over the long run.

[10] Banks should provide this further decomposition where it will allow users greater insight into the reliability of the estimates provided in the ‘quantitative disclosures: risk assessment’. In particular, banks should provide this information where there are material differences between the PD, LGD or EAD estimates given by banks compared to actual outcomes over the long run. Banks should also provide explanations for such differences.

Table 5

Securitisation: disclosure for IRB approaches

Qualitative Disclosures	(a)	The regulatory capital approaches (e.g. RBA and SFA) that the bank follows for its securitisation activities.
Quantitative Disclosure	(b)	Aggregate amount of securitisation exposures retained or purchased and the associated IRB capital charges for these exposures broken down into a meaningful number of risk weight bands. Exposures that have been deducted from common equity should be disclosed separately by type of underlying asset.