

Minimum Capital Requirements For Banks & DFIs

Revised Regulatory Capital Framework under Basel II

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List of Abbreviations

ABCP	Asset-backed commercial paper
ADC	Acquisition, development and construction
AFS	Available for Sale
AMA	Advanced measurement approaches
ASA	Alternative standardized approach
CAR	Capital adequacy ratio
CCF	Credit conversion factor
CDNS	Central directorate of national savings
CF	Commodities finance
CRM	Credit risk mitigation
DFI	Development financial institution
EAD	Exposure at default
ECA	Export credit agency
ECAI	External credit assessment institution
EL	Expected loss
FMI	Future margin income
HVCRE	High-volatility commercial real estate
I/O	Interest-only strips
ICAAP	Internal capital adequacy assessment process
IPRE	Income-producing real estate
IRB	Internal ratings-based
LGD	Loss given default
M	Effective maturity
MDB	Multilateral development bank
MTB	Market treasury bills
NIF	Note issuance facility
OECD	Organization for economic co-operation and development
OF	Object finance
PD	Probability of default
PF	Project finance
PKR	Pakistan Rupees
PSE	Public sector entity
QRRE	Qualifying revolving retail exposures
RUF	Revolving underwriting facility
RWA	Risk weighted assets
SBP	State Bank of Pakistan
SFT	Securities financing transaction
SL	Specialized lending
SME	Small- and medium-sized entity
SPV	Special purpose vehicle
SRP	Supervisory Review Process
TFC	Term finance certificate
TSA	The standardized approach
UCITS	Undertakings for collective investments in transferable securities
UL	Unexpected loss

Introduction

The instructions contained in Part I of this circular cover capital requirements against credit and operational risks. Besides, it requires banks to allocate capital against market risk emanating mainly from their trading activities. Nevertheless, there are other risk factors that can lead to significant loss to the institutions against which there is as such no specific capital requirement under part I. Though higher level of capital may act as a buffer against loss arising out of these other risks, it cannot be a substitute of other means available for addressing risk, such as strengthening risk management, applying internal limits, strengthening the level of provisions and reserves, and improving internal controls. In order to ensure the long term viability of institutions, it is important that they not only maintain capital well above the minimum capital requirements set out in part I of instructions described hereinafter, but also institute a robust risk management framework covering all major risks the institution is exposed to. Since there is a relationship between the amount of capital required and the effectiveness of bank's risk management and internal control processes, there should be a process of capital allocation based on institution's internal risk assessment and overall risk appetite.

Part-II of these instructions relates to the supervisory review process (SRP). The emphasis of the SRP is on banks' own Internal Capital Adequacy Assessment Process (ICAAP). The SRP would be a regular feature during the implementation phase necessitating continuous interaction between SBP and the banks.

Part I

Minimum Capital Requirements

Chapter 1: GENERAL INSTRUCTIONS

1.1. Scope of Application

This capital adequacy framework applies on all banks and Development Financial Institutions (DFIs) on solo as well as on consolidated basis. The term ‘bank’, wherever used throughout the document, unless otherwise specified, means all the banks and DFIs under regulatory purview of State Bank of Pakistan (SBP). For the purpose of capital adequacy, the consolidated bank means a group of financial entities¹ whose parent or holding company is a bank or a DFI.

All banking and other relevant financial activities (both regulated and unregulated) conducted within a group containing a bank shall be captured through consolidation. Thus, majority-owned or –controlled financial entities should be fully consolidated.

If any majority-owned securities or other financial subsidiaries are not consolidated for capital purposes, all equity and other regulatory capital investments in those entities attributable to the group will be deducted, and the assets and liabilities, as well as third-party capital investments in the subsidiary will be removed from the bank’s balance sheet.

Significant minority investments in banking, securities and other financial entities, where control does not exist, will be excluded from the banking group’s capital by deduction of the equity and other regulatory investments. For the purpose, equity interest of 20% to 50% will be considered as significant minority investment. The reciprocal crossholdings of bank capital artificially designed to inflate the capital position of banks will be deducted for capital adequacy purposes.

A bank that owns an insurance subsidiary bears the full entrepreneurial risks of the subsidiary and should recognize on a group-wide basis the risks included in the whole group. When measuring regulatory capital for banks, the equity holdings (majority or significant minority as defined earlier) shall be required to be deducted from capital. Under this approach the bank would remove from its balance sheet assets and liabilities, as well as third party capital investments in an insurance subsidiary.

Significant minority and majority investments in commercial entities exceeding 15% of bank’s capital shall be deducted from its capital. Further, if aggregate amount of such investments (including strategic investments) exceeds the threshold of 60% of a bank’s capital, it is required to deduct from its capital the portion exceeding the threshold.

¹ Financial entities mean banks, DFIs, Exchange Companies, Investment banks, leasing companies, Modarabas, Discount houses, brokerage firms, Mutual funds but do not include Insurance companies.

1.2. Minimum Capital Requirements

- i) No Bank incorporated in Pakistan shall commence and carry on its business unless it has a minimum paid up capital (net of losses) as prescribed in BSD Circular 6 dated 28 October 2005.
- ii) No Bank shall carry on its business in Pakistan unless it maintains a minimum Capital Adequacy Ratio (CAR) commensurate with its risk profile as envisaged in BSD Circular 6 dated 28 October 2005.

1.3. Definition of Capital

For the purpose of calculating regulatory capital requirement, banks are required to classify their capital into three tiers as follows;

1.3.1. Tier 1 Capital

Tier 1 capital also called core capital shall comprise of highest quality capital elements and will include;

- i. Fully paid up capital / capital deposited with SBP²
- ii. Balance in share premium account
- iii. Reserve for Issue of Bonus Shares
- iv. General Reserves as disclosed on the balance-sheet
- v. Un-appropriated / un-remitted² profits (net of accumulated losses, if any)

1.3.2. Tier 2 Capital

The Tier 2 capital shall include;

- i. General Provisions or General Reserves for loan losses
- ii. Revaluation Reserves
- iii. Exchange translation Reserves
- iv. Undisclosed Reserves
- v. Subordinated debt.

1.3.3. Tier 3 Capital

The Tier 3 capital consisting of short-term subordinated debt would be solely for the purpose of meeting a proportion of the capital requirements for market risk.

1.3.4. Eligibility Criteria

The computation of the amount of Core (Tier 1) and Supplementary (Tier 2 and Tier 3) Capitals shall be subject to the following limitations and restrictions: -

² In the case of foreign banks operating as branches in Pakistan.

- a. The sum total of the different components of the eligible Tier 2 and eligible Tier 3 Capital will be limited to the sum total of the various components of the eligible Tier 1 or Core Capital.
- b. General Provisions or General Reserves for loan losses shall include only such provisions, which are not created against identified losses and are as such freely available to meet unidentified losses. These provisions or reserves will be limited to maximum of 1.25% of total Risk Weighted Assets. **This rule is exclusively for Standardized Approach. Under IRB Approach where the total expected loss amount exceeds total eligible provisions, banks must deduct the difference 50% from Tier-1 and 50% from Tier-2. However, where the total expected loss amount is less than total eligible provisions, banks can recognize this difference in Tier-2 capital up to the maximum of 0.6% of the credit risk-weighted assets. A detailed treatment of provisions under IRB is given in chapter 3.**
- c. Revaluation Reserves shall be the Reserves created by revaluation of fixed assets and equity instruments held by the bank. The revaluation reserves shall be net off against any deficit on account of revaluation of Available for Sale (AFS) securities. The assets and investments must be prudently valued fully taking into account the possibility of price fluctuations and forced sale value. Revaluation reserves reflecting the difference between the book value and the market value will be eligible up to 45%³ for treatment as Supplementary Capital subject to the condition that the reasonableness of the revalued amount is duly certified by the external auditors of the bank. Besides, banks are allowed to include foreign exchange translation reserves in their Tier 2 supplementary capital.
- d. Undisclosed Reserves will be permitted to be included in the Supplementary Capital despite being unpublished, provided they appear in the internal accounts of the bank and have basically arisen out of the earnings of the institution duly certified by the External Auditors and are accepted as such by SBP. To be eligible to be shown as part of the Supplementary Capital, the Undisclosed Reserves should not be encumbered by any provision or known liability and should be freely available to meet unforeseen losses.
- e. Subordinated debt will be limited to a maximum of 50% of the amount of Tier 1 capital and will also include rated and listed subordinated debt instruments⁴ (like TFCs/Bonds) raised in the capital market. To be eligible for inclusion in the supplementary capital, the instrument should be fully paid up, unsecured, subordinated as to payment of principal and profit, to all other indebtedness of the bank including deposits, and should not be redeemable before maturity without prior approval of SBP. Further it should be subject to a lock-in clause, stipulating that neither interest nor principal may be paid (even at maturity) if such payment means that the bank falls below or remains below its minimum capital requirements.
- f. The Tier 3 capital shall be solely for the purpose of meeting capital requirement for market risk. This means that any capital requirement, arising out of credit and

³ Basel Accord requires the banks to apply a discount factor of 55% to the amount of revaluation reserves, hence the amount eligible for inclusion in tier 2 capital becomes 45%.

⁴ For details see Appendix 1.1 Rules for subordinated debt instruments.

counterparty risk, including counterparty risk in respect of derivatives in both trading and banking books, needs to be met by the eligible Tier 1 and Tier 2 capital.

- g. Tier 3 capital will be limited to 250% of a bank's Tier 1 capital that is available (after meeting credit risk capital requirement) to support market risk. This means that a minimum of about 28½% of market risk needs to be supported by Tier 1 capital which is not required to support risks in the remainder of the book. For instance, if a bank has Tier 1 capital of PKR 100 and the capital requirement for credit risk is PKR 90, the remaining Tier 1 capital of PKR 10 is available for market risk and thus the bank can have maximum eligible Tier 3 capital of PKR 25 (250% of 10).
- h. Tier 2 elements may be substituted for Tier 3 up to the same limit of 250% in so far as the overall limits prescribed in 'a' and 'e' above is not breached, that is to say eligible Tier 2 and Tier 3 capitals may not exceed total Tier 1 capital, and subordinated debt may not exceed 50% of Tier 1 capital.
- i. For short-term subordinated debt to be eligible as Tier 3 capital, it needs, if circumstances demand, to be capable of becoming part of a bank's permanent capital and thus be available to absorb losses in the event of insolvency. It must, therefore, at a minimum:
 - a. Be unsecured, subordinated and fully paid up;
 - b. Have an original maturity of at least two years and is not repayable before the agreed repayment date without approval of SBP.
- j. The banks before issuing any subordinated debt instruments (like TFCs/Bonds), to qualify for inclusion in supplementary (Tier-2 or Tier 3) capital, will be required to obtain prior approval of SBP.

1.3.5. Capital Deductions

In order to obtain the eligible regulatory capital for the purpose of calculating Minimum Capital Requirements, banks are required to make following deductions from their Tier-1 capital;

- a) Book value of goodwill.
- b) Shortfall in provisions required against classified assets irrespective of any relaxation allowed by SBP.
- c) Remaining deficit on account of revaluation of investments held in "Available for Sale" category after netting off from any other surplus on AFS securities.

In addition they are also required to make deductions as described earlier under Scope of Application as well as in Appendix 1.1 (3)(iii). Where deductions of investments are made pursuant to this part on scope of application, the deductions will be 50% from Tier 1 and 50% from Tier 2 capital.

1.4. Measurement of Capital Adequacy Ratio

In order to calculate their capital adequacy ratio, banks are required to calculate their Risk Weighted Assets (RWA) in respect of Credit, Market and Operational Risks. The methodologies to calculate RWA for each of these risk categories are described in detail

in subsequent chapters. The Capital Adequacy Ratio is then calculated by taking eligible regulatory capital as numerator and total RWA as denominator.

1.5. Reporting Requirements

All Banks are required to meet at all times the capital requirement set out in these guidelines on consolidated as well as on standalone basis. Banks are required to report to SBP their capital adequacy according to the prescribed formats (to be notified separately) on consolidated as well as on standalone basis.

1.6. Notification Requirements

A bank must inform SBP immediately of:

- a. Any breach of the minimum capital adequacy requirements set out in these instructions and the remedial measures it has taken to address those breaches.
- b. Any concerns it has about its capital adequacy, along with proposed measures to address these concerns.

1.7. Reductions in Capital

Where a bank intends any reduction in its capital, it must obtain SBP's prior written consent.

1.8. Penalty for Non-Compliance

Any bank that fails to meet the minimum paid up capital requirement or CAR within the stipulated period shall render itself liable to the following actions:

- i. Imposition of penalties and/or such restrictions on its business including restrictions on acceptance of deposits and lending as may be deemed fit by SBP.
- ii. De-scheduling of the bank, thereby converting it into a non-scheduled bank.
- iii. Cancellation of the banking license if SBP believes that the bank is not in a position to meet the minimum paid up capital requirement or CAR.

Appendix 1.1

Rules For Unsecured Subordinated Debt Instruments:

1-Terms of Issue

To be eligible for inclusion in supplementary capital the terms of issue of the subordinated debt instruments should be in conformity with the following:

a) Amount:

The amount of subordinated debt to be raised may be decided by the Board of Directors of the bank.

b) Maturity Period:

The subordinated debt instruments should have a minimum original fixed term to maturity of over 5 years to be eligible for Tier 2 capital and 2 years for being eligible for Tier 3 capital.

For the purpose of counting the subordinated debt towards supplementary capital, during the last five years to maturity, a discount factor of 20 % per year will be applied as follows.

Remaining Maturity of the Instrument	Rate of Discount
Less than or equal to one year	100%
More than one year but less than or equal to two years	80%
More than two years but less than or equal to three years	60%
More than three years but less than or equal to four years	40%
More than four years but less than or equal to five years	20%

In case a subordinated debt has staggered principal repayments, the outstanding amount included in supplementary capital must be discounted by 20% a year (20% of the original amount less any redemption) during the last five years to maturity.

c) Rating:

The instruments should be rated separately – Minimum rating should be equivalent to ‘2’ (as defined in Table 2.3) by a credit rating agency recognized by SBP.

d) Rate of Profit:

The instruments should be ‘vanilla’. The issuer shall decide rate of profit.

e) Minimum Disclosure Requirements:

The issuing bank must clearly disclose in the offer documents that the instrument is unsecured, subordinated as to payment of principal and profit to all other indebtedness of the bank, including deposits and is not redeemable before maturity without prior approval of SBP.

f) Other conditions

- i) Sponsor shareholders of the issuing bank shall not be allowed to participate in or hold the subordinated debt instruments of the issuing bank directly or through their affiliates. The same restriction will also apply to the employees’ retirement benefit funds of the issuing bank.
- ii) Bank should indicate the amount/details of subordinated debt raised as supplementary capital by way of explanatory notes in their annual audited accounts and quarterly Statement of Minimum Capital Requirement, submitted to SBP.

2 - Grant of advances against Subordinated Debt Instruments.

Bank should not grant advances against the security of their own subordinated debt issue. While granting loans/advances against subordinated debt instruments of other banks, the margin requirement prescribed under Prudential Regulation R-6 shall be maintained, however the bank's total financing against subordinated debt instruments issued by bank should not exceed its total equity (Tier-I capital less deductions). Further, the bank shall not provide any accommodation to finance purchase of its subordinated debt instrument.

3 - Investments in TFCs of other banks.

Banks may invest in subordinated/unsecured TFCs issued by other banks to raise Tier -2 or Tier 3 Capital subject to above mentioned conditions. However:

- i. The banks' investments in such TFCs will be assigned a risk weight of 100% and will not be deducted from Tier-I capital for the purpose of calculating the Capital Adequacy Ratio, provided the banks' investment in such TFCs does not exceed 10% of their equity (in the case of DFIs not mobilizing deposits/ COIs from general public, the investment in such TFCs will not exceed 25% of their equity).
- ii. Bank's investment in a single issue of such TFCs of any other bank will not at any time exceed 5% of its own equity or 15% of the total size of the issue, whichever is less.
- iii. The investments of the banks in such TFCs in excess of the limits prescribed at Paras 3(i) and 3(ii) above will be assigned a risk weight of 0% for Capital Adequacy Purpose and will be deducted from Tier-I Capital of the investing bank.

4 - Other Requirements

- i. The issuing bank should submit a report to SBP giving details of the subordinated debt, such as amount raised, maturity of the instrument, rate of profit etc. within one month from the date of issue.
- ii. The proceeds of rupee denominated debt instruments offered/issued to non-residents would have to be repatriated to Pakistan and converted into rupees by the bank concerned and the Proceeds Realization Certificate would be furnished to SBP. The bank concerned will be allowed to remit the principal amount of debt instruments at maturity as well as the profit/interest thereon from the interbank market. Hedging will not be available on such instruments. Banks should comply with all the terms and conditions, if any set out in any law in the country with regard to issue of the instruments.

Chapter 2

Credit Risk: The Standardized Approach

2.1 Definitions

- 2.1.1 Sovereign** Means the central government, provincial government or the central bank of a country.
- 2.1.2 PSE** Public sector entity (PSE) is one, which is owned or controlled by central or provincial government or any entity categorized as PSE by SBP.
- 2.1.3 Corporate** “Corporate” refers to any proprietorship, partnership or limited company that is neither a PSE, Bank, DFI, nor borrower within the definition of regulatory retail exposures. For capital adequacy purposes, the term also includes insurance companies and securities firms. Under Standardized Approach, SMEs not fulfilling the conditions of the regulatory retail portfolio would also be considered as Corporates.
- 2.1.4 Past due** An exposure is considered past due **in whole** if mark-up/interest on it or principal is overdue as per the prudential regulations as amended from time to time.
- 2.1.5 Retail** The exposure to an individual person or persons or to a small business; and is in the form of revolving credits and lines of credit (including credit cards and overdrafts), personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance) and small business facilities and commitments. Mortgage loans are not included in this category. To be eligible, the total exposure to a single person;
- Should not be more than PKR 10 million both in cases of consumer loans and small business loans
 - Should not be more than 0.2% of total (gross) retail portfolio of bank.
- Past due retail loans are to be excluded from the overall regulatory retail portfolio when assessing the granularity criterion of 0.2% specified herein, for risk-weighting purposes.
- 2.1.6 Residential Mortgage finance** Loans fully secured against residential real estate. It includes loans provided to individuals for the purchase of residential house / apartment. The loans availed for the purpose of making improvements in house / apartment / land shall also fall under this category. Loans secured by residential real estate for business purposes and loans secured against commercial real estate do not fall under mortgage loans.
- 2.1.7 Core Market Participants** Core market participants include the following entities:
- a) Sovereigns, central banks and PSEs; b) Banks; c) Other financial companies (including insurance companies) eligible for a 20% risk weight in the Standardized Approach; d) Regulated mutual funds that are subject to capital or leverage requirements; e) Regulated pension funds; and f) Recognized clearing organizations.

2.2. Methodology.

This chapter outlines the methodology to calculate the risk-weighted assets for credit risk using the Standardized Approach (SA). Under this approach the capital requirement is based on the risk assessment (hereinafter called credit rating) made by External Credit Assessment Institutions (ECAIs) recognized as eligible by SBP for capital adequacy purposes. Banks using this approach are required to assign a risk weight individually to all their on-balance sheet and off-balance sheet exposures. Risk weights are based on external rating grade or a fixed weight that is broadly aligned with the likelihood of counterparty default. The calculation of risk weighted assets for credit and operational risks using the simplest options available under Standardized Approach have been outlined in the Appendix-A at the end of the document.

2.3 Use of Ratings

Banks are required to use ratings of ECAIs recognized by SBP for capital adequacy purposes. Mapping of ratings of various recognized ECAIs with that of SBP rating grade is given in Table 2.3 which is indicative. The recognition to these ECAIs has initially been granted for two years. SBP will review the performance of the ECAIs and may extend the recognition for another period as deemed fit. Furthermore, the indicative mapping may also be reviewed by SBP keeping in view the other market developments. Pakistani banks, having exposures abroad, may use the ratings assigned by ECAIs recognized by the respective supervisors of the jurisdictions. However, the risk weights will only be assigned after their mapping with SBP grades for which approval would be granted on case-to-case basis. The general requirements in this regard are as follows.

2.3.1 Unsolicited Ratings

If both solicited as well as unsolicited ratings of eligible ECAIs are available for a claim, the banks must use the solicited rating. Banks may use unsolicited ratings (if solicited rating is not available) assigned by recognized ECAIs. However, whether or not the banks choose to use unsolicited ratings, it must be consistent and based on the policy approved by the Board of Directors.

2.3.2 Short-term ratings

Short-term ratings may only be used for short-term claims against banks (local as well as foreign) and corporate counterparties. If there is an issue-specific short-term rating in respect of a claim, it must be used to produce the risk of the claim. A short-term issue-specific rating cannot be used to risk-weight any other claim. Where counterparty has a short-term claim that attracts a 50 percent risk-weight, unrated short-term claims on the same counterparty cannot be risk-weighted less than 100 percent. Where the counterparty has a short-term claim that attracts a risk-weight of 150 percent, all unrated claims (short- and long-term) on the same counterparty must be risk-weighted at not less than 150 percent. Table 2.1 below provides a framework for banks' exposure to specific short-term facilities, such as particular issuance of commercial paper.

Table 2.1

External grade (short term claims on banks and corporates)	1	2	3	4
Risk Weight	20%	50%	100%	150%

2.3.3. Ratings Disclosure

Banks must disclose the ECAI it is using for each type of claim. Further it must use the chosen ECAI and their rating consistently for each type of claim. Banks are not allowed to “cherry pick” the assessments provided by different ECAIs.

2.3.4. Multiple Assessments

If there is only one assessment by an ECAI chosen by a bank for a particular claim, that assessment should be used to determine the risk weight of the claim. If there are two assessments by ECAIs chosen by a bank, which map into different risk weights, the higher risk weight will be applied. If there are three or more assessments with different risk weights, the assessments corresponding to the two lowest risk weights should be referred to and the higher of those two risk weights will be applied.

2.3.5. Issuer Versus Issue Assessments

Where a bank invests in a particular issue that has an issue-specific assessment, the risk weight of the claim will be based on this assessment. Where the bank’s claim is not an investment in a specific assessed issue, the following general principles apply.

- In circumstances where the borrower has a specific assessment for an issued debt, but the bank’s claim is not an investment in this particular debt, a high quality credit assessment (one which maps into a risk weight lower than that which applies to an unrated claim) on that specific debt may only be applied to the bank’s un-assessed claim if this claim ranks *pari passu* or senior to the claim with an assessment in all respects. If not, the credit assessment cannot be used and the un-assessed claim will receive the risk weight for unrated claims.
- In circumstances where the borrower has an issuer assessment, this assessment typically applies to senior unsecured claims on that issuer. Consequently, only senior claims on that issuer will benefit from a high quality issuer assessment. Other un-assessed claims of a highly assessed issuer will be treated as unrated. If either the issuer or a single issue has a low quality assessment (mapping into a risk weight equal to or higher than that which applies to unrated claims), an un-assessed claim on the same counterparty will be assigned the same risk weight as is applicable to the low quality assessment.

Whether the bank intends to rely on an issuer- or an issue-specific assessment, the 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 i.e. the assessment must take into account all the amounts owed whether principal or markup or both.

In order to avoid any double counting of credit enhancement factors, no recognition of credit risk mitigation techniques will be taken into account if the credit enhancement is already reflected in the issue specific rating. Therefore no additional recognition of risk mitigants will be allowed in respect of claims for which issue specific rating is used.

2.3.6. Domestic Currency and Foreign Currency Assessments

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

2.3.7. Level of application of the assessment

External assessments for one entity within a corporate group cannot be used to risk weight other entities within the same group.

2.4. Risk Weights - On-Balance Sheet Exposures

The risk-weighting process used for measuring a bank's on-balance sheet credit exposures covers all on-balance sheet assets held by it, except the following specifically excluded items:

- a) Those assets or investments that are required to be deducted from Tier 1 and/or Tier 2 capital
- b) All debt and equity securities held in the trading book (the associated risk-weighted exposures are determined in accordance with the methodology prescribed in chapter 5)
- c) On-balance sheet unrealized gains on market-related off-balance sheet transactions (which are to be included in the calculation of bank's total risk-weighted off-balance sheet credit exposures)
- d) Securitization exposures, which are subject to separate rules.

The total risk-weighted on-balance sheet credit exposures equal the sum of the risk-weighted amounts of each on-balance sheet asset. The risk-weighted amount of an on-balance sheet asset is determined by multiplying its current book value (including accrued interest or revaluations, and net of any specific provision or associated depreciation) by the relevant risk-weight specified in Table 2.2. The table describes risk weights associated with a rating scale of 1 to 6. A mapping of this scale to the long term ratings of different recognized ECAs is given in Table 2.3. An exposure that does not fall within any category mentioned in Table 2.2 for associated risk weights and categories defined under Section 2.1, shall be risk weighted according to **criteria for corporate exposures**.

Where an exposure is secured by eligible collateral as set out in Section 2.6.2 or the bank has obtained direct irrevocable and unconditional credit protection such as guarantee or credit derivative, it may reduce its capital charge by taking benefit of the risk mitigation described in Section 2.6 of this chapter.

Table 2.2

	Exposure Type	External Rating	Risk Weight
a.	Cash and Cash Equivalents		0%
b.	Claims on Government of Pakistan (federal or provincial governments) and SBP, denominated in PKR.		0%
c.	Foreign Currency claims on SBP arising out of statutory obligations of banks in Pakistan		0%
d.	Claims on other sovereigns ⁵ and on Government of Pakistan or provincial governments or SBP denominated in currencies other than PKR	1 2 3 4,5 6 Unrated	0% 20% 50% 100% 150% 100%
e.	Claims on Bank for International Settlements, International Monetary Fund, European Central Bank, and European Community		0%
f.	Claims on Multilateral Development Banks ⁶	1 2,3 4,5 6 Unrated	20% 50% 100% 150% 50%
g.	Claims on Public Sector Entities ⁷ in Pakistan	1 2,3 4,5 6 Unrated	20% 50% 100% 150% 50%
h.	Claims on Banks	1 2,3 4,5 6 Unrated	20% 50% 100% 150% 50%
i.	Claims, denominated in foreign currency, on banks with original maturity of 3 months or less	1,2,3 4,5 6 unrated	20% 50% 150% 20%
j.	Claims on banks with original maturity of 3 months or less denominated in PKR and funded in PKR		20%
k.	Claims on Corporates (excluding equity exposures)	1 2 3,4 5,6 Unrated	20% 50% 100% 150% 100%

5 For foreign currency claims on sovereigns, the banks may also use risk-weights on the basis of the consensus country risk scores (mapped to the SBP 6 rating grades in Table 2.3) of export credit agencies (ECA) participating in the “Arrangement on Officially Supported Export Credits”. These scores are available on the OECD’s website.

6 Claims against following MDBs may however be assigned a risk weight of 0% : The World Bank Group comprised of the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IADB), the European Investment Bank (EIB), the European Investment Fund (EIF), the Nordic Investment Bank (NIB), the Caribbean Development Bank (CDB), the Islamic Development Bank (IDB), and the Council of Europe Development Bank (CEDB).

7 Certain PSEs maybe treated as sovereigns for lower risk weights. The names of these PSEs will be notified separately.

	Exposure Type	External Rating	Risk Weight
l.	Claims categorized as retail portfolio		75%
m.	Claims fully secured by residential property (Residential Mortgage Finance as defined in Section 2.1)		35%
n.	<p>Past Due loans:⁸</p> <ol style="list-style-type: none"> 1. The unsecured portion of any claim (other than loans and claims secured against eligible residential mortgages as defined in Section 2.1) that is past due for more than 90 days and/or impaired will attract risk weight as follows: <ul style="list-style-type: none"> • where specific provisions are less than 20 per cent of the outstanding amount of the past due claim ; • where specific provisions are no less than 20 per cent of the outstanding amount of the past due claim. • where specific provisions are more than 50 per cent of the outstanding amount of the past due claim. 2. Loans and claims fully secured against eligible residential mortgages that are past due for more than 90 days and/or impaired 3. Loans and claims fully secured against eligible residential mortgage that are past due by 90 days and /or impaired and specific provision held there-against is more than 20% of outstanding amount 		<p>150%</p> <p>100%</p> <p>50%</p> <p>100%</p> <p>50%</p>
o.	Listed equity investments and regulatory capital instruments issued by other banks (other than those deducted from capital) held in banking book		100%
p.	Unlisted equity investments (other than those deducted from capital) held in banking book		150%
q.	Investments in venture capital		150%
r.	Investments in premises, plant and equipment and all other fixed assets		100%
s.	Claims on all fixed assets under operating lease		100%
t.	All other assets		100%

⁸ Risk weights are to be assigned net of specific provision

Table 2.3
Long-Term Rating Grades Mapping

SBP Rating Grade	ECA Scores	PACRA	JCR-VIS
1	0,1	AAA AA+ AA AA-	AAA AA+ AA AA-
2	2	A+ A A-	A+ A A-
3	3	BBB+ BBB BBB-	BBB+ BBB BBB-
4	4	BB+ BB BB-	BB+ BB BB-
5	5,6	B+ B B-	B+ B B-
6	7	CCC+ and below	CCC+ and below

Short-Term Rating Grades Mapping

SBP Rating Grade	PACRA	JCR-VIS
S1	A-1	A-1
S2	A-2	A-2
S3	A-3	A-3
S4	Others	Others

2.5. Risk Weights Off-Balance Sheet Exposures

This section outlines the procedures and requirements for calculating the risk-weighted amount in respect of off-balance sheet credit exposures under the Standardized Approach for capital adequacy purposes.

Banks are required to calculate their risk-weighted assets for all off-balance sheet (OBS) exposures. The total risk weighted assets with respect to credit risk of OBS exposure will be the sum of risk-weighted assets for market related and non-market related OBS transactions.

The Market-related transactions include the following:

- a) **interest rate contracts** - this includes single currency interest rate swaps, basis swaps, forward rate agreements, interest rate futures, interest rate options purchased and any other instruments of a similar nature;
- b) **foreign exchange contracts** - this includes cross currency swaps (including cross currency interest rate swaps), forward foreign exchange contracts, currency futures, currency options purchased, hedge contracts and any other instruments of a similar nature;
- c) **equity contracts** - this includes swaps, forwards, purchased options and similar derivative contracts based on individual equities or equity indices;
- d) **other market-related contracts** - this includes any contracts covering other items, which give rise to credit risk.

The Non-market related off balance sheet exposure includes direct credit substitutes, trade and performance related contingent items and other commitments. The risk-weighted amount of an off-balance sheet transaction that gives rise to credit exposure is generally calculated by means of a two-step process:

- i) First, the notional amount of the transaction is converted into an on-balance sheet equivalent (i.e. credit equivalent amount) by multiplying the amount by a specified credit conversion factor; and
- ii) Second, the resulting credit equivalent amount is multiplied by the risk-weight associated with that counterparty (as described in Table 2.4 Section 2.4 *Risk-weights On-balance Sheet Credit Exposures*).

Where the transaction is secured by eligible collateral, guarantee or credit derivative, the credit risk mitigation techniques detailed in Section 2.6 shall apply.

2.5.1. Risk Weights Non-Market Related Off-Balance Sheet Exposures

As stated earlier, the risk weighted assets of any off balance sheet exposure is calculated by first converting it to a credit equivalent by multiplying the exposure amount with a credit conversion factor. Table 2.4 gives the CCF associated with various type of off balance sheet Non Market related transactions. Once the credit equivalent amount is obtained it shall be multiplied with the risk weight associated with respective counterparty.

Table 2.4

Credit conversion factors for non-market-related off-balance sheet transactions

Nature of transaction	Credit Conversion Factor (CCF)
Direct credit substitutes Any irrevocable off-balance sheet obligation which carries the same credit risk as a direct extension of credit, such as an undertaking to make a payment to a third party in the event that a counterparty fails to meet a financial obligation or an undertaking to a counterparty to acquire a potential claim on another party in the event of default by that party, constitutes a direct credit substitute (i.e. the risk of loss depends on the creditworthiness of the counterparty or the party against whom a potential claim is acquired). This includes potential credit exposures arising from the issue of guarantees and credit derivatives (selling credit protection), confirmation of letters of credit, issue of standby letters of credit serving as financial guarantees for loans, securities and any other financial liabilities, and bills endorsed under bill endorsement lines (but which are not accepted by, or have the prior endorsement of, another bank).	100%
Performance-related contingencies Contingent liabilities, which involve an irrevocable obligation to pay a third party in the event that counterparty fails to fulfill or perform a contractual non-monetary obligation, such as delivery of goods by a specified date etc (i.e. the risk of loss depends on a future event which need not necessarily be related to the creditworthiness of the counterparty involved). This includes issue of performance bonds, bid bonds, warranties, indemnities, and standby letters of credit in relation to a non-monetary obligation of counterparty under a particular transaction.	50%
Trade-related contingencies Contingent liabilities arising from trade-related obligations, which are secured against an underlying shipment of goods for both issuing and confirming bank. This includes documentary letters of credit issued, acceptances on trade bills, shipping guarantees issued and any other trade-related contingencies.	20%
Lending of securities or posting of securities as collateral The lending or posting of securities as collateral by banks. This includes repurchase/reverse repurchase agreements and securities lending/borrowing transaction. ⁹	100%
Other commitments (a) Commitments with certain drawdown. (b) Commitments (e.g. undrawn formal standby facilities and credit lines) with an original maturity of: (i) one year or less. (ii) over one year. (c) Commitments that can be unconditionally cancelled at any time without notice (e.g. undrawn overdraft and credit card facilities providing that any outstanding unused balance is subject to review at least annually) or effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness.	100% 20% 50% 0%

⁹ Where a bank, acting as an agent, arranges a repurchase/reverse repurchase or securities lending/borrowing transaction between a customer and a third party and provides a guarantee to the customer that the third party will perform on its obligations, then the risk to the bank is the same as if the bank had entered into the transaction as principal. In such circumstances, the bank will be required to calculate capital requirements as if it, itself, was the principal. These transactions are risk-weighted according to the type of assets or the issuer of securities (as appropriate) and not according to the counterparty with whom the transaction is made, where the credit risk associated with the underlying asset which has been sold (temporarily with recourse) or purchased, remains with the bank.

Where the non-market-related off-balance sheet transaction is an un-drawn or partially un-drawn facility, the amount of un-drawn commitment to be included in calculating a bank's 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 part of on-balance sheet credit exposure and will be subject to the requirements laid down earlier in this chapter.

With regard to irrevocable commitments to provide off-balance sheet facilities, the original maturity will be measured from the commencement of the commitment up until the time the associated facility expires. For example, an irrevocable commitment, with an original maturity of six months, to provide finance with a nine-month term, is deemed to have an original maturity of 15 months.

Irrevocable commitments to provide off-balance sheet facilities should be assigned the lower of the two applicable credit conversion factors. For example, an irrevocable commitment with an original maturity of six months to provide a guarantee in support of counterparty for a period of nine months attracts the 50 per cent credit conversion factor applicable to the commitment.

2.5.2. Risk Weights Market-related Off-Balance Sheet Exposures

In calculating risk-weighted off-balance sheet credit exposures arising from market-related transactions for capital adequacy purposes, the bank must include all its market-related transactions held in the banking and trading books which give rise to off-balance sheet credit risk.

The credit risk on off-balance sheet market-related transactions is the cost to a bank of replacing the cash flow specified by the contract in the event of counterparty default. This will depend, among other things, on the maturity of the contract and on the volatility of rates underlying that type of instrument. Exemption from capital weighting is permitted for:

- i) Foreign exchange contracts with SBP.
- ii) Foreign exchange contract which have an original maturity of 14 calendar days or less; and
- iii) Instruments traded on futures and options exchanges, which are subject to daily mark-to-market and margin payments.

Banks may, for capital adequacy purposes, net off-balance sheet claims and obligations arising from market-related contracts across both the banking and trading books, arising from contracts with a single counterparty, where the relevant obligations are covered by eligible bilateral netting agreements.

The credit equivalent amount of an off-balance sheet market-related transaction, whether held in the banking or trading book, must be determined as follows:

- i) in the case of interest rate and foreign exchange contracts:
 - a) by the current exposure (also known as the mark-to-market) method; or
 - b) with SBP's prior approval in writing, by the original exposure method; and
- ii) in all other cases, by the current exposure (mark-to-market) method.

2.5.2.1. Current exposure method

In current exposure method, the credit equivalent amount of a market-related contract is the sum of current credit exposure and potential future credit exposure (the add-on) of these contracts. Current credit exposure is defined as the sum of the positive mark-to-market value (or replacement cost) of the contract. The Potential future credit exposure is determined by multiplying the notional principal amount of each of these contracts (regardless of whether the contract has a zero, positive or negative mark-to-market value) by the relevant credit conversion factor specified in Table 2.5 according to the nature and residual maturity of the instrument.

Potential future credit exposure should be based on effective rather than apparent notional amounts. In the event that the stated notional amount of a contract is leveraged or enhanced by the structure of the transaction, bank must use the effective notional amount when calculating potential future credit exposure. For example, a stated notional amount of PKR 1 million with payments based on two times 6 month MTB would have an effective notional amount of PKR 2 million.

Potential future credit exposure is required to be calculated for all OTC contracts regardless whether the replacement cost is positive or negative except single currency floating / floating interest rate swaps; the credit exposure on these contracts is evaluated solely on the basis of their mark-to-market value.

Table 2.5
Add-on Factor under current exposure method.

Residual Maturity	Interest Rate	Foreign Exchange rate	Equity
One year or less	0.0%	1.0%	6.0%
Over one year to five year	0.5%	5.0%	8.0%
Over Five year	1.5%	7.5%	10.0%

2.5.2.2. Original exposure method

Where the original exposure method is used, the credit equivalent amount of an off-balance sheet market-related contract is determined by multiplying the notional principal amount of the contract by the appropriate credit conversion factor specified in Table 2.6;

Table 2.6
Credit Conversion Factor Original Exposure method

Original maturity	Interest rate contracts	Foreign exchange contracts
1 year or less	0.5%	2.0%
> 1 year to 2 years	1.0%	5.0% (i.e. 2% + 3%)
For each additional year	1.0%	3.0%

2.6. Credit Risk Mitigation (CRM)

A collateralized transaction is one in which

- a bank has credit exposure or potential credit exposure and
- that credit exposure is hedged¹⁰ in whole or in part by collateral posted by the counterparty or a third party on the behalf of the counterparty.

Where a transaction is secured by eligible collateral and meets the eligibility criteria and minimum requirements, banks are allowed to reduce their exposure under that particular transaction by taking into account the risk mitigating effect of the collateral for the calculation of capital requirement.

In this regard there are two approaches i) Simple Approach ii) Comprehensive Approach. Banks may operate under either but not both approaches in the banking book, but only under the Comprehensive Approach in the trading book. Partial collateralization is recognized in both approaches. Mismatches in the maturity of the underlying exposure and the collateral will only be allowed under the Comprehensive Approach.

No transaction in which CRM techniques are used should receive a higher capital requirement than an otherwise identical transaction where such techniques are not used.

The effects of CRM shall not be double counted. Therefore, no additional recognition of CRM for regulatory capital purposes will be granted on claims for which an issue-specific rating is used that already reflects that CRM.

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 and market risks. 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

¹⁰ Banks use a number of techniques to reduce their credit risk to which they are exposed to. For instance exposure may be collateralized by first priority claims, in whole or in part with cash or securities, a loan may be guaranteed by third party or the bank may buy a credit derivative to offset various forms of credit risk; additionally the loan agreement may allow banks to offset their claims against a counterparty with a deposit from the same counterparty.

the bank's overall credit risk profile. Where these risks are not adequately controlled, SBP may impose additional capital charges or take other supervisory actions.

2.6.1. Minimum Conditions

In order for banks to obtain capital relief for any use of CRM techniques, the following minimum conditions/requirements must be met.

- i) All documentation used for collateralized transactions and for documenting guarantees and credit derivatives must be binding on all parties and legally enforceable in all relevant jurisdictions. 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.
- ii) 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 the default, insolvency or bankruptcy (or one or more otherwise-defined credit events set out in the transaction documentation) of the counterparty and, where applicable, of the custodian holding the collateral. Furthermore banks must take all steps necessary to fulfill those requirements under the law applicable to the bank's interest in the collateral for obtaining and maintaining an enforceable security interest, e.g. by registering it with a registrar, or for exercising a right to net or set off in relation to transfer of title of collateral.
- iii) For a collateral to provide protection, the credit quality of the counterparty and the value of the collateral must not have a material positive correlation. For example, securities issued by the counterparty - or by any related group entity - would provide little protection and so would be ineligible.
- iv) Banks must have clear and robust procedures for the timely liquidation of collateral
- v) It should be ensured that legal conditions required for declaring the default of the counterparty and liquidating the collateral are observed, so that the collateral can be liquidated promptly.
- vi) Where the collateral is held by a custodian, banks must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.
- vii) A capital requirement will be applied to a bank on either side of the collateralized transaction: for example, both repos and reverse repos will be subject to capital requirements. Likewise, both sides of a security lending and borrowing transaction will be subject to explicit capital charges, as would the posting of securities in connection with a derivative exposure or other borrowing.
- viii) Where a bank, acting as an agent, arranges a repo-style transaction (i.e. repurchase/reverse repurchase and securities lending/borrowing transactions) between a customer and a third party and provides a guarantee to the customer that the third party will perform on its obligations, then the risk to the bank is the same as if the bank had entered into the transaction as a principal. In such circumstances, a bank will be required to calculate capital requirements as if it were itself the principal.

2.6.2. Eligible Collateral

2.6.2.1. Simple Approach

Subject to the general conditions set out in Section 2.6.1, the following forms of collateral are eligible collateral under the Simple Approach to credit risk mitigation under Basel II:

- i) Cash (as well as certificates of deposit or comparable instruments) on deposit with the bank, which is incurring the counterparty exposure¹¹ &¹²
- ii) Gold.
- iii) Debt securities rated by a recognized external credit assessment institution where these are either:
 - a) at least rated '4' when issued by sovereigns or PSEs that are treated as sovereigns by SBP
 - b) at least rated '3' when issued by other entities (including banks and securities firms); or
 - c) at least rated 'S3' for short-term debt instruments.
- iv) Debt securities not rated by a recognized external credit assessment institution where these are:
 - a) Issued by a bank; and
 - b) Listed on a recognized exchange; and
 - c) Classified as senior debt; and
 - d) All rated issues of the same seniority by the issuing bank are rated at least '3'/'S3' by a recognized ECAI; and
 - e) The bank holding the security as collateral has no information to suggest that issue justifies a rating below '3'/'S3' and
 - f) SBP views such securities as liquid and marketable.
- v) Equities (including convertible bonds) those are included in a main index.
- vi) Undertakings for Collective Investments in Transferable Securities (UCITS) and mutual funds where:
 - a) a price for the units is publicly quoted daily; and
 - b) the UCITS/mutual fund is limited to investing in the instruments listed under Simple Approach to credit risk mitigation.¹³

¹¹ Cash funded credit linked notes issued by the bank against exposures in the banking book, which fulfill the criteria for credit derivatives will be treated as cash collateralized transactions.

¹² When cash on deposit, certificates of deposit or comparable instruments issued by the lending bank are held as collateral at a third-party bank in a non-custodial arrangement, if they are openly pledged/assigned to the lending bank and if the pledge/assignment is unconditional and irrevocable, the exposure amount covered by the collateral (after any necessary haircuts for currency risk) will receive the risk weight of the third-party bank

¹³ However, the use or potential use by a UCITS/mutual fund of derivative instruments solely to hedge investments listed in this paragraph and under the Comprehensive Approach to credit risk mitigation shall not prevent units in that UCITS/mutual fund from being eligible financial collateral.

2.6.2.2. Comprehensive Approach

The following collateral instruments are eligible for recognition in the Comprehensive Approach:

- i) All of the instruments eligible under Simple Approach
- ii) Equities (including convertible bonds) which are not included in a main index but which are listed on a recognized exchange;
- iii) UCITS/mutual funds which include such equities.

2.6.3. Methodology

2.6.3.1. Simple Approach.

In the Simple Approach the risk weighting of the collateral instrument collateralizing or partially collateralizing the exposure is substituted for the risk weighting of the counterparty. The use of Simple Approach will be subject to following conditions:

- i) For collateral to be recognized in the Simple Approach, the collateral must be pledged for at least the life of the exposure (i.e. a maturity mismatch under Simple Approach will not be allowed, and it must be marked to market and revalued¹⁴ with a minimum frequency of six months.
- ii) Those portions of claims collateralized by the market value of recognized collateral receive the risk weight applicable to the collateral instrument.
- iii) The risk weight on the collateralized portion will be subject to a floor of 20% except under the conditions v), vi) and vii) specified below. The remainder of the claim should be assigned to the risk weight appropriate to the counterparty.
- iv) A capital requirement will be applied to banks on either side of the collateralized transaction: for example, both repos and reverse repos will be subject to capital requirements.
- v) Transactions, which fulfill the criteria outlined under the conditions for **Zero Hair-Cut for repo-style transactions** and are with a **core market participant**; receive a risk weight of 0%. If the counterparty to the transactions is not a core market participant the transaction should receive a risk weight of 10%.
- vi) OTC derivative transactions subject to daily mark-to-market, collateralized by cash and where there is no currency mismatch should receive a 0% risk weight. Such transactions collateralized by sovereign or PSE securities qualifying for a 0% risk weight in the Standardized Approach can receive a 10% risk weight.
- vii) The 20% floor for the risk weight on a collateralized transaction will not be applied and a 0% risk weight can be applied where the exposure and the collateral are denominated in the same currency, and either:
 - a) the collateral is cash or deposit receipt; or

¹⁴ For Government debts like CDNS instruments where quoted prices are not available, the current encashable value may be used instead.

- b) the collateral is in the form of sovereign/PSE securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

2.6.3.2. Comprehensive Approach

In the Comprehensive Approach, for transactions secured by eligible collateral, banks need to first calculate the net exposure (hereinafter called adjusted exposure) amount by taking into account the effect of collateral. The adjusted exposure amount (if positive) is then weighted according to risk-weight of the counterparty to obtain the risk-weighted asset amount for the collateralized transaction.

In calculating the adjusted exposure amount after risk mitigation, adjustments (hereinafter called “haircuts”) are applied to both the collateral and the exposure to take into account possible future price fluctuations. This will produce volatility-adjusted amounts for both exposure and collateral. Unless either side of the transaction is cash, the volatility-adjusted amount for the exposure will be higher than the exposure and for the collateral it will be lower. The adjusted exposure is the difference between the volatility adjusted exposure and the volatility adjusted value of collateral.

Where the exposure and collateral are held in different currencies an additional downward adjustment must be made to the volatility adjusted collateral amount to take account of possible future fluctuations in exchange rates.

Where the volatility-adjusted exposure amount is greater than the volatility-adjusted collateral amount (including any further adjustment for foreign exchange risk), bank shall calculate their risk-weighted assets as the difference between the two multiplied by the risk weight of the counterparty. The framework for performing these calculations is as follows:

For a collateralized transaction, the exposure amount after risk mitigation is calculated as;

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

where:

E^* = the exposure value after risk mitigation

E = current value of the exposure

H_e = haircut appropriate to the exposure

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.

E^* will be multiplied by the risk weight of the counterparty to obtain the risk-weighted asset amount for the collateralized transaction.

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 risk weight of the asset (as measured by unit of currency) in the basket and H_i is the haircut applicable to that asset.

a. Maturity mismatch

Where the residual maturity of the CRM is less than that of the underlying credit exposure a maturity mismatch occurs. Where there is a maturity mismatch and the CRM has an original maturity of less than one year, the CRM is not recognized for capital purposes. In other cases where there is a maturity mismatch, a partial recognition is given to CRM for regulatory capital purposes as detailed below.

(i) Definition of maturity

The maturity of the underlying exposure and the maturity of the hedge should both be defined conservatively. The effective maturity of the underlying should be gauged as the longest possible remaining time before the counterparty is scheduled to fulfill its obligation, taking into account any applicable grace period. For the hedge, embedded options which may reduce the term of the hedge should be taken into account so that the shortest possible effective maturity is used. Where a call is at the discretion of the protection seller, the maturity will always be at the first call date. If the call is at the discretion of the protection buying bank but the terms of the arrangement at origination of the hedge contain a positive incentive for the bank to call the transaction before contractual maturity, the remaining time to the first call date will be deemed to be the effective maturity. For example, where there is a step-up in cost in conjunction with a call feature or where the effective cost of cover increases over time even if credit quality remains the same or increases, the effective maturity will be the remaining time to the first call.

(ii) Risk weights for maturity mismatches

Hedges with maturity mismatches are only recognized when their original maturities are greater than or equal to one year. As a result, the maturity of hedges for exposures with original maturities of less than one year must be matched to be recognized. In all cases, hedges with maturity mismatches will no longer be recognized when they have a residual maturity of three months or less.

When there is a maturity mismatch with recognized credit risk mitigants (collateral, guarantees and credit derivatives) the following adjustment will be applied.

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

Where:

- P_a = value of the credit protection adjusted for maturity mismatch
- P = credit protection (e.g. collateral amount, guarantee amount) adjusted for any haircuts
- t = min (T, residual maturity of the credit protection arrangement) expressed in years
- T = min (5, residual maturity of the exposure) expressed in years

b. Calculation of Haircuts

There are two ways of calculating the haircuts: (i) standard supervisory haircuts and (ii) own-estimate haircuts, using banks' own internal estimates of market price volatility.

The use of banks' own estimate of haircuts will be subject to SBP approval and fulfillment of prescribed criteria. However banks may choose to use standard or own-estimate haircuts independently of the choice it has made between the Standardized Approach and the Foundation IRB Approach provided that banks seek to use their own-estimate haircuts, they must do so for the full range of instrument types for which they would be eligible to use own-estimates, the exception being immaterial portfolios where they may use the standard supervisory haircuts.

The size of the individual haircuts will depend on the type of instrument, type of transaction and the frequency of marking-to-market and remargining. For example, repo style transactions subject to daily marking-to-market and to daily remargining will receive a haircut based on a 5-business day holding period and secured lending transactions with daily mark-to-market and no remargining clauses will receive a haircut based on a 20-business day holding period. These haircut numbers will be scaled up using the square root of time formula depending on the frequency of remargining or marking-to-market.

i. Standard SBP Supervisory haircuts

The Standard supervisory haircuts are given in Table 2.7 (assuming daily marked – to – market, daily remargining and 10 business day holding period), expressed in percentage.

Table 2.7

Issue rating for debt securities	Residual Maturity	Sovereigns	Other issuers
1 ¹⁵	≤1 year	0.5	1
	>1 year, ≤5 years	2	4
	>5	4	8
2 – 3 and unrated bank securities as defined in Para 2.6.2.1(iv)	≤1 year	1	2
	>1 year, ≤5 years	3	6
	>5 years	6	12
4	All	15	
Main index equities (including convertible bonds) and Gold		15	
Other equities (including convertible bonds) listed on a recognized exchange		25	
UCITS/Mutual funds		Highest haircut applicable to any security in which the fund can invest	
Cash in the same currency		0	

15 Same haircuts would also be applied on PKR claims on Government of Pakistan (Federal & Provincial) and SBP.

The standard supervisory haircut for currency risk where exposure and collateral are denominated in different currencies is 8% (also based on a 10-business day holding period and daily mark-to-market).

For transactions in which the bank lends non-eligible instruments (e.g. non-investment grade corporate debt securities), the haircut to be applied on the exposure should be the same as the one for equity traded on a recognized exchange that is not part of a main index.

ii. Own estimates of Haircuts

Banks may calculate haircuts using their own internal estimates of market price volatility and foreign exchange volatility subject to SBP approval. Permission to do so will be granted if the banks satisfy SBP that they fulfill the quantitative and qualitative criteria given below.

When debt securities are rated 3 or better, banks may calculate a volatility estimate for each category of security. In determining relevant categories, banks 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. For debt securities rated '4' or for equities eligible as collateral, the haircuts must be calculated for each individual security.

Banks must estimate the volatility of the collateral instrument or foreign exchange mismatch individually: estimated volatilities for each transaction must not take into account the correlations between unsecured exposure, collateral and exchange rates.

Criteria for using own estimate of Haircuts.

Quantitative:-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. The minimum holding periods for different types of transactions are presented in Table 2.8. 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.

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 (that is, the weighted average time lag of the individual observations cannot be less than 6 months).

Bank 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.

No particular type of model is prescribed. So long as each model used captures all the material risks run by the bank, banks will be free to use models based on, for example, historical simulations and Monte Carlo simulations.

Qualitative:-The estimated volatility data (and holding period) must be used in the day-to-day risk management process of the bank.

Bank 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.

c. Adjustment for different holding periods and non-daily mark-to-market or remargining

For some transactions, depending on the nature and frequency of the revaluation and remargining provisions, different holding periods 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 capital-market-driven transactions and repo-style transactions, the documentation contains remargining clauses; in secured lending transactions, it generally does not.

The minimum holding period for various products is summarized below in Table 2.8.

Table 2.8

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 remargining

When the frequency of remargining or revaluation is longer than the minimum, the minimum haircut numbers will be scaled up depending on the actual number of business days between remargining or revaluation using the square root of time formula below:

$$H = H_M \sqrt{\frac{N_R + (T_M - 1)}{T_M}}$$

Where:

H = haircut

H_M = haircut under the minimum holding period

T_M = minimum holding period for the type of transaction

N_R = actual number of business days between remargining for capital market transactions or revaluation for secured transactions.

When a bank calculates the volatility on a T_N day holding period which is different from the specified minimum holding period T_M , the H_M will be calculated using the square root of time formula:

$$H_M = H_N \sqrt{\frac{T_M}{T_N}}$$

T_N = holding period used by the bank for deriving H_N

H_N = haircut based on the holding period T_N

For example, for banks using the standard supervisory haircuts, the 10-business day haircuts provided in Table 2.8 will be the basis and this haircut will be scaled up or down depending on the type of transaction and the frequency of remargining or revaluation using the formula below:

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

Where:

H = haircut

H_{10} = 10-business day standard supervisory haircut for instrument

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

d. Conditions for zero H

For repo-style transactions where the following conditions are satisfied, and the counterparty is a *core market participant*, banks may choose not to apply the haircuts specified in the Comprehensive Approach and may instead apply a haircut of zero. This carve-out will not be available for banks using the VaR modeling approach for calculation of haircuts described in subsequent paras.

- i) Both the exposure and the collateral are cash or a sovereign security or PSE security qualifying for a 0% risk weight in the Standardized Approach;
- ii) Both the exposure and the collateral are denominated in the same currency;

- iii) Either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily remargining;
- iv) Following a counterparty's failure to remargin, the time that is required between the last mark-to-market before the failure to remargin and the liquidation of the collateral is considered to be no more than four business days;
- v) The transaction is settled across a settlement system proven for that type of transaction;
- vi) The documentation covering the agreement is standard market documentation for repo-style transactions in the securities concerned;
- vii) The transaction is governed by documentation specifying that if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin or otherwise defaults, then the transaction is immediately terminable; and
- viii) Upon any default event, regardless of whether the counterparty is insolvent or bankrupt, the bank has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for its benefit.

e. Use of VaR Models

As an alternative to the use of standard or own-estimate haircuts, banks are permitted to use a VaR models 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 addition, other similar transactions (like prime brokerage), that meet the requirements for repo-style transactions, are also eligible to use the VaR models approach. The VaR models approach is available to banks subject to specific approval of SBP. However those banks that have specific approval to use internal market risk model for the calculation of capital requirement for market risk, may use internal model for the calculation of own estimates of haircuts.

The quantitative and qualitative criteria for recognition of internal market risk models for repo-style transactions and other similar transactions are in principle the same as under the Market Risk Framework. With regard to the holding period, the minimum will be 5- business days for repo-style transactions, rather than the 10-business days under the Market Risk Amendment. 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.

The calculation of the exposure E^* for banks using their internal market risk 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.

Subject to SBP approval, instead of using the VaR approach, banks may also calculate an expected positive exposure for repo-style and other similar “Securities Financing Transactions” (SFTs), in accordance with the Internal Model Method.

f. Treatment of repo-style transactions covered under master netting agreements

The effects of bilateral netting agreements covering repo-style transactions will be recognized on a counterparty-by-counterparty basis if the agreements are legally enforceable in each relevant jurisdiction upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, netting agreements must:

- i) 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;
- ii) 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;
- iii) allow for the prompt liquidation or set off of collateral upon the event of default; and
- iv) 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.

Netting across positions in the banking and trading book will only be recognized when the netted transactions fulfill the following conditions:

- All transactions are marked to market daily; and
- The collateral instruments used in the transactions are recognized as eligible financial collateral in the banking book.

The formula for the calculation of adjusted exposure will be adapted to calculate the capital requirements for transactions with netting agreements.

For banks using the standard supervisory haircuts or own-estimate haircuts, the framework below will apply to take into account the impact of master netting agreements.

$$E^* = \max \{0, [(\Sigma E - \Sigma C) + \Sigma(E_s \times H_s) + \Sigma(E_{fx} \times H_{fx})]\}^{16}$$

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 in a given security

H_s = haircut appropriate to E_s

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

H_{fx} = haircut appropriate for currency mismatch

¹⁶ The starting point for this formula is the formula in paragraph 2.6.3.2 which can also be presented as the following:
 $E^* = \max \{0, [(E-C) + (E \times H_e) + (C \times H_c) + (C \times H_{fx})]\}.$

g. Exceptions to the risk weight floor

Transactions, which fulfill the conditions for zero haircuts mentioned earlier and are with a core market participant, will receive a risk weight of 0%. If the counterparty to the transactions is not a core market participant the transaction should receive a risk weight of 10%.

OTC derivative transactions subject to daily mark-to-market, collateralized by cash and where there is no currency mismatch should receive a 0% risk weight. Such transactions collateralized by sovereign or PSE securities qualifying for a 0% risk weight in the Standardized Approach can receive a 10% risk weight.

The 20% floor for the risk weight on a collateralized transaction will not be applied and a 0% risk weight can be applied where the exposure and the collateral are denominated in the same currency, and either:

- the collateral is cash on deposit or
- the collateral is in the form of sovereign/PSE securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

h. Collateralized OTC derivatives transactions

Under the current exposure method, the calculation of the counterparty credit risk charge for an individual contract will be as follows:

$$\text{Counterparty charge} = [(RC + \text{add-on}) - C_A] \times r \times 8\%$$

Where:

- RC = the replacement cost,
 add-on = the amount for potential future exposure
 C_A = the volatility adjusted collateral amount under the Comprehensive Approach, or zero if no eligible collateral is applied to the transaction;
 and
 r = the risk weight of the counterparty.

When effective bilateral netting contracts are in place, RC will be the net replacement cost and the add-on will be calculated on net exposure. The haircut for currency risk (Hfx) should be applied when there is a mismatch between the collateral currency and the settlement currency. Even in the case where there are more than two currencies involved in the exposure, collateral and settlement currency, a single haircut assuming a 10-business day holding period scaled up as necessary depending on the frequency of mark-to-market will be applied. As an alternate to the current exposure method for calculation of the counter party credit risk charge, banks may also use the standardized method subject to SBP approval.

i. On-balance sheet netting

Where banks have legally enforceable netting arrangements for loans and deposits they may calculate capital requirements on the basis of net credit exposures subject to the following conditions and subject to applicable accounting standards in the country.

Where a bank,

- i) 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;
- ii) is able at any time to determine those assets and liabilities with the same counterparty that are subject to the netting agreement;
- iii) monitors and controls its roll-off risks; and
- iv) monitors and controls the relevant exposures on a net basis,

It may use the net exposure of loans and deposits as the basis for its capital adequacy calculation in accordance with the formula in paragraph 2.6.3.2. Assets (loans) are treated as exposure and liabilities (deposits) as collateral. The haircuts will be zero except when a currency mismatch exists. A 10-business day holding period will apply when daily mark-to market is conducted.

2.6.4. Guarantees

Where guarantees or credit derivatives are direct, explicit, irrevocable and unconditional, and that the banks fulfill minimum operational conditions relating to risk management processes outlined below, they may take into account benefit of such credit protection in calculating capital requirements.

A range of guarantors and protection providers are recognized. A substitution approach will be applied. Thus only guarantees issued by or protection provided 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 or protection provider, whereas the uncovered portion retains the risk weight of the underlying counterparty.

2.6.4.1. Detailed operational requirements for Guarantees

A guarantee (counter-guarantee) 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 irrefutable. 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 credit cover or that would increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure. It must also be unconditional; there should be no clause in the protection contract 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.

2.6.4.2. Additional operational requirements for Guarantees

In addition to the legal certainty requirements stated earlier, for a guarantee to be recognized, the following conditions must also be satisfied:

- a) On the qualifying default/non-payment of the counterparty, the bank may in a timely manner pursue the guarantor for any monies outstanding under the documentation governing the transaction. The guarantor may make one lump sum payment of all monies 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.

- b) The guarantee is an explicitly documented obligation assumed by the guarantor.
- c) The guarantee covers all types of payments the underlying obligor is expected to make under the documentation governing the transaction, for example notional amount, margin payments etc., except where a guarantee covers payment of principal only, interest and other uncovered payments should be treated as an unsecured amount.

2.6.4.3. Range of eligible guarantors (counter-guarantors)/protection providers

Credit protection given by the following entities will be recognized: Sovereigns¹⁷, PSEs, banks¹⁸ with a lower risk weight than the counterparty; other entities rated '2' or better. This would include credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor.

2.6.4.4. Risk weights

The protected portion is assigned the risk weight of the protection provider. The uncovered portion of the exposure is assigned the risk weight of the underlying counterparty.

Materiality thresholds on payments below which no payment is made in the event of loss are equivalent to retained first loss positions and must be deducted in full from the capital of the bank purchasing the credit protection.

2.6.4.5. Proportional cover

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/credit derivatives, with the remainder treated as unsecured.

2.6.4.6. Tranched cover

Where the bank transfers a portion of the risk of an exposure in one or more tranches to a protection seller or sellers and retains some level of risk of the loan and the risk transferred and the risk retained are of different seniority, banks may obtain credit protection for either the senior tranches (e.g. second loss portion) or the junior tranche (e.g. first loss portion).

2.6.4.6. Maturity Mismatch

Rules for maturity mismatch in case of guarantees are the same as for other collaterals defined earlier in Section 2.6.3.2 (a).

¹⁷ This includes the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community, as well as those MDBs eligible for 0% risk weight.

¹⁸ This includes other MDBs.

2.6.4.7. Currency mismatches

Where the credit protection 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 would be reduced by the application of a haircut H_{fx} , i.e.

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

Where:

- G = nominal amount of the credit protection
 H_{fx} = haircut appropriate for currency mismatch between the credit protection and underlying obligation.

The appropriate haircut based on a 10-business day holding period (assuming daily marking-to-market) will be applied. If a bank uses SBP 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.

2.6.4.8. Sovereign guarantees and counter-guarantees

As stated earlier in Table 2.2(b), a 0% risk weight will be applied to a bank's PKR exposures to Government of Pakistan (Federal or Provincial) and SBP. This rule shall also apply to the portions of claims guaranteed by GoP and SBP. A claim may also 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:

- the sovereign counter-guarantee covers all credit risk elements of the claim;
- 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
- SBP is satisfied that the cover is robust and that no historical evidence suggests that the coverage of the counter-guarantee is less than effectively equivalent to that of a direct sovereign guarantee.

2.6.5. Treatment of pools of CRM techniques

In the case where a bank has multiple CRM techniques covering a single exposure (e.g. a bank has both collateral and guarantee partially covering an exposure), the bank will be required to subdivide the exposure into portions covered by each type of CRM technique (e.g. portion covered by collateral, portion covered by guarantee) and the risk-weighted assets of each portion must be calculated separately. When credit protection provided by a single protection provider has differing maturities, they must be subdivided into separate protection as well.

2.6.6. Credit Derivatives

2.6.6.1. Operational Requirements

- In order for a credit derivative contract to be recognized, the following conditions must be satisfied:-
 - 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 obligor 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). When restructuring is not specified as a credit event, banks should follow the paragraph (ii).
- (b) If the credit derivative covers obligations that do not include the underlying obligation, para (g) below governs whether the asset mismatch is permissible.
- (c) 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 Section {2.6.3.2 (a) (i)}.
- (d) Credit derivatives allowing for cash settlement are recognized 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, para (g) below governs whether the asset mismatch is permissible.
- (e) If the protection purchaser's right/ability to transfer the underlying obligation to the protection provider is required for settlement, the terms of the underlying obligation must provide that any required consent to such transfer may not be unreasonably withheld.
- (f) The identity of the parties responsible for determining whether a credit event has occurred must be clearly defined. This determination must not be the sole responsibility of the protection seller. The protection buyer must have the right/ability to inform the protection provider of the occurrence of a credit event.
- (g) 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) 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.
- (h) A mismatch between the underlying obligation and the obligation used for purposes of determining whether a credit event has occurred is permissible if (1) the latter 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.
- ii) When the restructuring of the underlying obligation is not covered by the credit derivative, but the other requirements in paragraph (i) of this section are met, partial recognition of the credit derivative will be allowed. If the amount of the credit derivative is less than or equal to the amount of the underlying obligation, 60% of the amount of the hedge can be recognized as covered. If the amount of the credit derivative is larger than that of the underlying obligation, then the amount of eligible

hedge is capped at 60% of the amount of the underlying obligation. This 60% threshold may be reviewed subsequently.

- iii) Only credit default swaps and total return swaps that provide credit protection equivalent to guarantees will be eligible for recognition. The following exception applies. Where a bank buys credit protection through a total return swap and records the net payments received on the swap as net income, but does not record offsetting deterioration in the value of the asset that is protected (either through reductions in fair value or by an addition to reserves), the credit protection will not be recognized. The treatment of first-to default and second-to-default products is covered separately in paragraphs 2.6.6.2 and 2.6.6.3.

2.6.6.2 First-to-default credit derivatives

- (a) There are cases where a bank obtains credit protection for a basket of reference names and where the first default among the reference names triggers the credit protection and the credit event also terminates the contract. In this case, the bank may recognize regulatory capital relief for the asset within the basket with the lowest risk-weighted amount, but only if the notional amount is less than or equal to the notional amount of the credit derivative.
- (b) With regard to the bank providing credit protection through such an instrument, if the product has an external credit assessment from an eligible credit assessment institution, the risk weight in Section 4.5.2 chapter-4 applicable to securitization tranches will be applied. If the product is not rated by an eligible external credit assessment institution, the risk weights of the assets included in the basket will be aggregated up to a maximum of 1250% and multiplied by the nominal amount of the protection provided by the credit derivative to obtain the risk-weighted asset amount.

2.6.6.3. Second-to-default credit derivatives

- (a) In the case where the second default among the assets within the basket triggers the credit protection, the bank obtaining credit protection through such a product will only be able to recognize any capital relief if first-default-protection has also be obtained or when one of the assets within the basket has already defaulted.
- (b) For banks providing credit protection through such a product, the capital treatment is the same as in paragraph 2.6.6.2 (b) above with one exception. The exception is that, in aggregating the risk weights, the asset with the lowest risk weighted amount can be excluded from the calculation.

Chapter 3: Credit Risk Internal Ratings Based Approach

3.1 Definitions

3.1.1 Default: A default is considered to have occurred with regard to a particular obligor when either or both of the following two events have taken place.

- ✓ The bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the bank to actions such as realizing security (if held).
- ✓ If principal or mark-up/interest, on any of its material credit obligations, is overdue by 90 days or more from the due date or as defined in Prudential Regulations from time to time.

The elements to be taken as indications of unlikelihood to pay, inter alia include:

- ✓ The bank puts the credit obligation on non-accrued status.
- ✓ The bank makes a charge-off or 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 obligor's bankruptcy or a similar order in respect of the obligor's credit obligation to the banking group.
- ✓ The obligor 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.
- ✓ In case of overdrafts, obligor has breached an advised limit or has been advised of a limit smaller than current outstanding.

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. As such, default by a retail borrower on one obligation does not require a bank to treat all other obligations to the bank / its group as defaulted.

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 this definition of default. However, in such cases, banks must demonstrate to SBP that appropriate adjustments to the data have been made to achieve broad equivalence with the reference definition. This condition would also apply to any internal data used up to implementation of these capital adequacy instructions. Internal data (including that pooled by banks) used in such estimates, relating to earlier years must be consistent with the reference definition.

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

3.1.2 PD means the probability of default of counterparty over one year.

3.1.3 LGD or Loss Given Default means the loss incurred on a facility upon default of counterparty relative to the amount outstanding at default.

3.1.4 EAD or Exposure at Default means the expected gross exposure of a facility upon default of counterparty.

3.1.5 EL means the expected loss on a facility arising from the potential default of counterparty or the dilution risk relative to EAD over one year. Whereas “Dilution risk” means the possibility that the amount of a receivable is reduced through cash or non-cash credits to the receivable.

3.1.6 IRB Approach means Internal Ratings-based Approach.

3.1.7 Foundation IRB Approach means that, in applying the IRB framework, banks provide their own estimates of PD and use SBP estimates of LGD, EAD and effective maturity M.

3.1.8 Advanced IRB Approach means that, in applying the IRB framework, banks use their own estimates of PD, LGD and EAD, and are required to take into account the effective maturity M of credit facilities.

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

3.1.10 Facility grade means a category of loss severity in the event of default (as measured by LGD or EL) to which transactions are assigned on the basis of a specified and distinct set of rating criteria. The grade definition involves assessing the amount of collateral, and reviewing the term and structure of the transaction (such as the lending purpose, repayment structure and seniority of claims).

3.1.11 Rating system means 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.

3.1.12 Corporate Credit exposures. A credit exposure to a corporate is defined as a credit obligation of a corporation, partnership, or proprietorship and any other credit exposure that does not meet the criteria of any other defined IRB asset class. Banks are permitted to distinguish separately exposures to small- and medium-sized entities (SME) as per the respective definition.

3.1.13 Specialized Lending (SL) exposures. Within the corporate credit asset class, five sub-classes of specialized lending (SL) are identified. These sub-classes are project finance, object finance, commodities finance, income producing real estate and high-volatility commercial real estate. Such specialized lending should possess all the following characteristics, either in legal form or economic substance:-

- a) the exposure should be typically to an entity (often a special purpose entity (SPE)) which was created specifically to finance and/or operate specific assets;

- b) apart from the income that it receives from the asset(s) being financed the borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation,
- c) the terms of the obligation give the lender a substantial degree of control over the asset(s) and the income that it generates; and
- d) as a result of the factors mentioned above (a to c), the primary source of repayment of the obligation is the income generated by the asset(s), rather than the independent capacity of a broader commercial enterprise.

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

The borrower is usually a Special Purpose Entity (SPE) that is not permitted to perform any function other than developing, owning, and operating the installation. Consequently the repayment should depend primarily on the project's cash flow and on the collateral value of the project's assets. In contrast, if repayment of the exposure depends primarily on a well established, diversified, credit-worthy, contractually obligated end user for repayment, it is considered a secured exposure to that end-user.

3.1.13.2 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 as collateral. A primary source of these cash flows could 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 collateralized corporate exposure.

3.1.13.3 Commodities finance. Commodities finance (CF) refers to structured short-term lending to finance, inventories, or receivables of exchange-traded commodities (e.g. crude oil, metals, or crops), where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower primarily has no independent capacity to repay the exposure. 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. In such cases, the value of the commodity serves as a risk mitigant rather than as the primary source of repayment.

3.1.13.4 Income-producing real estate. Income-producing real estate (IPRE) refers to a method of providing funding to real estate (such as, office buildings to let, retail space, multifamily residential buildings, industrial or warehouse space, and hotels) where the prospects for repayment and recovery on the exposure depend primarily on the cash flows generated by the asset. The primary source of these cash flows would generally be

lease or rental payments or the sale of the asset. The borrower may be, but not necessarily required to be, a Special Purpose Entity (SPE), an operating company focused on real estate construction or holdings, or an operating company with sources of revenue other than real estate. The distinguishing characteristic of IPRE versus other corporate exposures that are collateralized by real estate is the strong positive correlation between the prospects for repayment of the exposure and the prospects for recovery in the event of default, with both depending primarily on the cash flows generated by a property.

3.1.13.5 High-volatility commercial real estate. High-volatility commercial real estate (HVCRE) lending is the financing of commercial real estate that exhibits higher loss rate volatility (i.e. higher asset correlation) compared to other types of Specialized Lending (SL), HVCRE includes:

- ✓ Commercial real estate exposures secured by properties of types that are categorized by having higher volatilities in portfolio default rates;
- ✓ Loans financing of any of the Land Acquisition, Development and Construction (ADC) phases for properties; and
- ✓ Loans financing for ADC of any other properties where the source of repayment at origination of the exposure is either the future uncertain sale of the property or cash flows whose source of repayment is substantially uncertain (e.g. the property has not yet been leased to the occupancy rate prevailing in that geographic market for that type of commercial real estate), unless the borrower has substantial equity at risk. Commercial ADC loans exempted from treatment as HVCRE loans on the basis of certainty of repayment of borrower equity are, however, ineligible for the additional reductions for SL exposures.

3.1.14 Sovereign exposures. This asset class covers all exposures to counterparties treated as sovereigns under the Standardized Approach. This includes sovereigns (and their central banks), provincial governments, PSEs treated as sovereigns, MDBs that meet the criteria for a 0% risk weight under the Standardized Approach, and the entities like Bank for International Settlements, IMF and European Central Bank.

3.1.15 Bank exposures. This asset class covers exposures to banks and DFIs. Bank exposures also include claims on domestic PSEs that are not treated as sovereigns under the Standardized Approach, and MDBs that do not meet the criteria for a 0% risk weight under the Standardized Approach.

3.1.16 Retail exposures. An exposure is categorized as a retail exposure if it meets all of the following criteria:

3.1.16.1 Nature of borrower or low value of individual exposures

- ✓ Exposures to individuals – such as revolving credits and lines of credit (e.g. credit cards, overdrafts, and retail facilities secured by financial instruments) as well as personal term loans and leases (e.g. installment loans, auto loans and leases, student and educational loans, personal finance, and other exposures with similar characteristics) – are generally eligible for retail treatment provided they are in line with the definition of retail exposures as given in Prudential Regulations for Consumer Financing.

- ✓ Residential mortgage loans (including first and subsequent liens, term loans and revolving home equity lines of credit) are eligible for retail treatment if allowed under PRs for Consumer Financing.
- ✓ Loans extended to small businesses and managed as retail exposures are eligible for retail treatment provided the total exposure of the bank to a small business borrower (on a consolidated basis where applicable) is within the limits defined under the heading of “retail” in Chapter-2. Small business loans extended through or guaranteed by an individual are also subject to the same exposure threshold.

3.1.16.2 Large number of exposures

The exposure must be one of a large pool of exposures, which are managed by the bank on a pooled basis. Small business exposures below the limit defined under the definition of retail in chapter-2 may be treated as retail exposures if the bank treats such exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures. This requires that such an exposure be originated in a similar manner to other retail exposures. Furthermore, it must not be managed individually in a way comparable to corporate exposures, but rather as part of a portfolio segment or pool of exposures with similar risk characteristics for the purposes of risk assessment and quantification. However, this does not preclude retail exposures from being treated individually at some stages of the risk management process. The fact that an exposure is rated individually does not by itself deny the eligibility as a retail exposure.

Within the retail asset class category, banks are required to identify separately three sub-classes of exposures: (a) exposures secured by residential properties as defined above, (b) qualifying revolving retail exposures, as defined in the following paragraph, and (c) all other retail exposures.

3.1.16.3 Qualifying revolving retail exposures

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 generally. Segmentation at the national or 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) The maximum exposure to a single individual in the sub-portfolio does not exceed PKR 1.000 million subject to the conditions spelt out in Prudential Regulations for Consumer Financing.
- (d) 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.

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

All banks classifying their exposures as QRRE sub portfolio must seek SBP's concurrence that the treatment as a qualifying revolving retail exposure is consistent with the underlying risk characteristics of the sub-portfolio.

3.1.17 Equity exposures. 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 from the capital of the bank. Whereas, 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 interest 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.

Additionally any of the following instruments must be categorized as equity exposure:-

- ✓ An instrument with the same structure as those permitted as Tier 1 capital for banking organizations.
- ✓ 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, 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, SBP 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, SBP 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 SBP.

For certain obligations that require or permit settlement by issuance of a variable number of the issuer's equity shares, the change in the monetary value of the obligation is equal to the change in the fair value of a fixed number of equity shares multiplied by a specified factor. Those obligations meet the conditions of item (c) above if both the factor and the referenced number of shares are fixed. For example, an issuer may be required to

settle an obligation by issuing shares with a value equal to three times the appreciation in the fair value of 1,000 equity shares. That obligation is to be the same as an obligation that requires settlement by issuance of shares equal to the appreciation in the fair value of 3,000 equity shares.

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. An equity that is recorded as a loan but arises from a debt/equity swap made as part of the orderly realization or restructuring of the debt is included in the definition of equity holdings. However, these instruments may not attract a lower capital charge than would apply if the holdings remained in the debt portfolio. This includes liabilities from which the return is linked to that of equities. SBP would decide not to require that such liabilities be included where they are directly hedged by an equity holding, such that the net position does not involve material risk. Conversely, equity investments that are structured with the intent of conveying the economic substance of debt holdings or securitization exposures would not be considered an equity holding. SBP can, at its discretion re- characterize debt holdings as equities for regulatory purposes.

3.1.18 Eligible purchased receivables Eligible purchased receivables are divided into retail and corporate receivables as defined below.

3.1.18.1 Retail receivables

Purchased retail receivables, provided the purchasing institution complies with the set out IRB rules for retail exposures, are eligible for the top-down approach as permitted within the existing standards for retail exposures. The bank must also apply the minimum operational requirements in this regard.

3.1.18.2 Corporate Receivables

In general, for purchased corporate receivables, banks are expected to assess the default risk of individual obligors (as specified in Section relating to computations of risk weighted assets and capital charge for corporate, sovereign and bank exposures) consistent with the treatment of other corporate exposures. However, the top-down approach may be used, provided that the purchasing bank's program for corporate receivables complies with both the criteria for eligible receivables and the minimum operational requirements of this approach. The use of the top-down purchased receivables treatment 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 corporate exposures that would otherwise apply. Primarily, it is intended for receivables that are purchased for inclusion in asset-backed securitization structures, but banks may also use this approach, with the approval of SBP, for appropriate on-balance sheet exposures that share the same features.

SBP may deny the use of the top-down approach for purchased corporate receivables depending on the bank's compliance with minimum requirements. 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, inter-company 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.

The existence of full or partial recourse to the seller 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 where banks meet the minimum eligibility criteria and operational requirements.

3.2 Application of IRB and Phased Rollout

3.2.1 Scope of Application

As a matter of principle, it is mandatory for banks planning to adopt IRB Approaches, to conduct their own detailed feasibility study and analyze the associated cost and benefits which the bank would be having by adoption of any of the approaches under IRB. Nonetheless, some banks could be building the IRB systems from the scratch and such adoption would entail significant changes in their existing system, it would, therefore, be more practicable for such banks to start with Foundation IRB Approach rather than adopting Advanced IRB Approach straight away. However, adoption of Advanced IRB Approach is not entirely ruled out, if banks concerned can satisfy the underlying stringent criteria required to adopt the approach, particularly their ability to calculate their own estimates of Loss Given Default (LGD) and resultant Exposure at Default (EAD).

All banks willing to adopt the IRB Approach should discuss their plans with SBP soon after they have drawn up their internal strategy and have carried out detailed feasibility for adoption of IRB Approach duly approved by their Board of Directors and concerned functional group of senior management in case of foreign banks. As a whole, the overall implementation plans should be exacting and yet realistic. All such plans should be driven by the practicality and feasibility of moving to the more Advanced Approaches, and should not be motivated by a desire to adopt a Pillar-1 approach that minimizes the capital charge of the bank. Whether any bank would be able to use IRB Approach for assessing their capital adequacy, would be subject to the approval by SBP. SBP would grant this approval after satisfying itself (through on-site validation) that the particular bank has the ability and has fulfilled the underlying qualitative and quantitative requirements of the IRB Approaches. It should be noted by all the banks planning to adopt the IRB Approaches that the primary responsibility for validating and ensuring the quality of an internal rating system lies with their management and Board of Directors.

3.2.2 Phased Rollout

There are chances that the lack of data, or other factors, make it difficult for banks to apply the IRB framework, at the same time, to all portfolios across the whole organization, especially for larger banks. To address this, SBP has decided to allow a phased rollout of IRB within the bank. Under the IRB framework, it has been recognized that, data limitations may mean that banks can meet the standards for the use of own estimates of LGD and EAD for some but not their entire asset classes at the same time. The banks must mention in their feasibility study how and when the IRB is to be implemented throughout the organization.

Furthermore, once on IRB, data limitations may mean that banks can meet the standards for the use of own estimates of LGD and EAD for some but not all of their asset classes/business lines at the same time. As such, SBP may allow banks to adopt a phased rollout of the IRB Approach across the institution. The phased rollout includes:-

- (i) Adoption of IRB across asset classes within the same business unit (or in the case of retail exposures across individual sub-classes);
- (ii) Adoption of IRB across business units in the same banking group; and
- (iii) Move from the Foundation Approach to the Advanced approach for certain risk components.

However, when a bank adopts an IRB Approach for an asset class within a particular business unit (or in the case of retail exposures for an individual sub-class), it must apply the IRB Approach to all exposures within that asset class (or sub-class).

Banks adopting an IRB Approach are required to continue to employ an IRB Approach. A voluntary return to the Standardized or Foundation Approach is not allowed. However, SBP may permit by way of specific approval, such migration, only in extraordinary circumstances, such as divestiture of a large fraction of bank's credit related function.

3.2.3 Conditions for Partial Use of IRB

In view of the sophistication of IRB Approaches, those banks who have decided to implement IRB in phases / partially use IRB, they must meet following conditions in order to obtain approval from SBP for partial IRB use. *General requirements* include:

- the existence of a development plan within the institution to implement IRB in phases
- SBP's approval of the overall decision to use IRB for regulatory purposes as well as of decisions to move each of the asset classes and business units to such an approach
- Periodic review by SBP – as part of the Supervisory Review Process, to take into account the bank's adherence to the development plan

Specific requirements are those that apply to only one (or perhaps several) asset class(es), but not to all. Also included are requirements for using one particular IRB Approach. For instance, retail exposures can only be treated under IRB if the bank's internal system qualifies for Advanced IRB since there is no Foundation IRB Approach for such claims. If the bank does not qualify for Advanced IRB for its retail exposures, then it would have to apply the Standardized Approach on the same.

Partial use of IRB and Specialized Lending:- Specialized lending (SL) is an area where data limitations may be particularly acute. Accordingly, the IRB framework allows banks to choose from three supervisory treatments, subject to specific conditions.

- **A supervisory slotting criteria approach** where banks that do not meet the requirements for estimating PDs for SL assets must map their internal risk grades to five supervisory categories and their associated risk weights. These slotting criteria for such categories are given at Appendix-3.1.
- **A Foundation IRB Approach** for banks that can determine PD estimates. This can be applied to all SL asset classes except the high volatility commercial real estate (HVCRE) portfolio. However, with specific SBP approval, banks that meet the requirements of PD estimation for HVCRE can use Foundation Approach, which is similar in all respects to the Approach for corporates with the exception of formula for correlations as given in Section 3.6.9 (c).
- **An Advanced IRB Approach** for banks that can estimate PD, LGD and EAD, can also be applied to all SL asset classes except for the HVCRE portfolio. However, with specific SBP approval, banks that meet the requirements of PD estimation for HVCRE can use Advanced Approach, which is similar in all respects to the Approach for corporates with the exception of formula for correlations as given in Section 3.6.9 (c).

3.3 Transitional Arrangements and Capital Floors

3.3.1 Parallel Calculation

For the banks adopting the IRB Approaches from 1st January 2010, to ensure smooth transition to Basel II, there would be a parallel run of two years alongside Standardized Approach, starting from 1st January 2008. Banks' internal plans for Basel II implementation would be reviewed and continuously monitored by SBP during the pre-implementation period as well as during parallel run. Banks interested in adopting Internal Ratings Based Approaches for capital requirement against credit risk before 1st January 2010 may approach SBP for the purpose. Their requests will be considered on case-to-case basis and they would be required to do the parallel calculations under IRB alongside the BSD Circular No. 12 dated 25 August 2004.

The transition period starts on the date of implementation of IRB framework by the banks and will last for three years from that date. By the end of the transition period, the following minimum requirements should be met by the banks:-

- For corporate, sovereign and bank exposures under the Foundation IRB, regardless of the data source, banks must use at least five years of data to estimate the PD.
- For retail exposures, regardless of the data sources banks must use at least five years data to estimate loss characteristics (EAD, and either expected loss (EL) or PD and LGD).
- For all the exposure categories under IRB Approaches, banks should demonstrate that they have been using a rating system that was broadly in line with minimum requirements mentioned herein for at least three years prior to qualification.

- The above applicable transitional arrangements also apply to the PD/LGD Approach to equity. There is no transitional arrangement for the market-based Approach to the equity.

Under transitional arrangements banks are required to have minimum of two years of data at the implementation date. This requirement will increase by one year for each of three years of transition.

3.3.2 Capital Floors

For the banks using the IRB Approach for credit risk, there will be a capital floor following the implementation of IRB framework as mentioned in Table 3.1. The capital floor will be based on calculation as per Standardized Approach. For the banks adopting IRB Approaches prior to the implementation date, the capital floors will be based on calculations as per the current capital adequacy requirements. It is derived by applying an adjustment factor to the following amount:-

- 8% of Risk Weighted Assets; plus
- Tier 1 and Tier -2 capital deductions and less
- Amount of general provisions that may have been recognized in Tier -2

The adjustment factor for banks using IRB Approach whether Foundation or Advanced are as under:-

Table 3.1

Approaches	Dec 2008	Dec 2009	Dec 2010 - 1st Year of implementation	Dec 2011 2nd Year of implementation	Dec 2012 3rd Year of implementation
Foundation IRB	Parallel Calculation	Parallel Calculation	95%	90%	80%
Advanced IRB	Parallel Calculation	Parallel Calculation	90%	90%	80%

The years in which the floor applies, banks must also calculate:-

- 8% of total risk-weighted assets as calculated under this framework (Basel-II) less
- the difference between total provisions and expected loss and plus
- Other Tier -1 and Tier -2 deductions.

The above-mentioned floor would be reviewed by SBP with the changes in basic frame work of Basel-II.

3.4: Minimum Requirement of IRB

To be eligible for the IRB Approach a bank must demonstrate to SBP that it meets required minimum requirements at the time of adoption of IRB and on an ongoing basis. The focus is on banks' abilities to rank order and quantify risk in a consistent, reliable and valid fashion. The minimum requirements for adoption of IRB Approaches are:-

- 3.4.1. Composition of minimum requirements,
- 3.4.2. Compliance with minimum requirements,
- 3.4.3. Rating system design,
- 3.4.4. Risk rating system operations,
- 3.4.5. Corporate governance and oversight,
- 3.4.6. Use of internal ratings,
- 3.4.7. Risk quantification,
- 3.4.8. Disclosure requirements.
- 3.4.9. Validation of Internal Estimates

3.4.1 Composition of minimum requirements

The overarching principle behind minimum requirements is that the ratings, 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.

The systems and processes must be consistent with internal use of these estimates. There could be differences in rating methodologies, banking products, and practices, it is required that banks customize the same according to their operational procedures.

The minimum requirements set out in the subsequent paras are applicable to all asset classes unless particularly mentioned. 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.

The minimum requirements set out here are applicable to both Foundation and Advanced Approaches unless noted otherwise. Generally, all IRB banks must produce their own estimates of PD 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. However it should be noted that banks are not required to produce their own estimates of PD for certain equity exposures and certain exposures that fall within the Specialized Lending sub-class.

3.4.2. Compliance with minimum requirements

To be eligible for an IRB Approach, bank must demonstrate to SBP that it meets the IRB requirements in this document, at the outset and on an ongoing basis. Banks' overall credit risk management practices must also be consistent with the evolving sound practices.

There may be circumstances when a bank is not in complete compliance with all the minimum requirements. In such case, the bank must produce a plan for a timely return to compliance, and seek approval from SBP, 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 satisfactorily implement the plan or to demonstrate

immateriality will lead SBP to reconsider the bank's eligibility for the IRB Approach. Furthermore, for the duration of any non-compliance, SBP will consider the need for the bank to hold additional capital under Supervisory Review Process or take other appropriate supervisory action.

3.4.3. Rating system design

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 utilize multiple rating methodologies/systems. For example, a bank may have customized rating systems for specific industries or market segments (e.g. middle market, and large corporate). If a bank chooses to use multiple systems, the rationale for assigning a borrower to a 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 minimize 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.

While there is no single standard for the design of a rating system, it must include several elements to qualify for determining regulatory capital

- a) *Rating Dimensions***:- There must be two distinct rating dimensions, one reflecting the risk of borrower default (PD), the other reflecting elements specific to the transaction, such as collateral or product type.

Standard for Corporate, Sovereign and Bank Exposures.

A qualifying IRB rating system must have two separate and distinct dimensions:-

- (i) The risk of borrower default, and
- (ii) Transaction-specific factors (Facility).

The first dimension that is rating with respect to the risk of borrower default (Obligor Rating /Grade) 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:-

1. 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.
2. When the treatment of associated guarantees to a facility may be reflected in an adjusted borrower grade.

In either case, separate exposures may result in multiple grades for the same borrower. 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.

The second dimension that relates to the structure of the transaction (Facility Rating) must reflect transaction-specific factors, such as collateral, seniority, product type, etc. For Foundation IRB banks, this requirement can be fulfilled by the existence of a facility dimension, which reflects both borrower and transaction-specific factors. For example, a rating dimension that reflects EL by incorporating both borrower strength (PD) and loss severity (LGD) considerations would qualify. Likewise a rating system that exclusively reflects LGD would qualify. Where a rating dimension reflects EL and does not separately quantify LGD, the supervisory estimates of LGD must be used.

For banks using the Advanced Approach, facility ratings must reflect exclusively 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 SBP that it improves the relevance and precision of their estimates.

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 general corporate Foundation or Advanced Approach for the SL subclass.

Standards for Retail Exposures

Rating systems for retail exposures must be oriented to both borrower and transaction risk, and 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 grouping of sufficiently homogenous exposures, and allows for accurate and consistent estimation of loss characteristics at pool level.

For each pool, banks must estimate PD, LGD, and EAD. Multiple pools may share identical PD, LGD and EAD estimates. At a minimum, bank should consider the following risk drivers when assigning exposures to a pool:-

- 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.
- Delinquency of exposure: Banks are expected to separately identify exposures that are delinquent and those that are not.

- b) ***Rating Structure / Borrower Grades:-*** The rating system must provide specific grades for non-defaulted borrowers, and at least one grade for defaulted borrowers. The borrower grade is an assessment of borrower risk on the basis of specified and distinct set of rating criteria. The grade definition must include a description of the degree of default risk typical for borrowers with this grade and the criteria used to distinguish that level of credit risk.

Standard for Corporate, Sovereign and Bank Exposures.

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; SBP requires that banks, which lend to borrowers of diverse credit quality, should have a greater number of borrower grades.

A borrower grade is broadly 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. Whereas, 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.

Banks with loan portfolios concentrated in a particular market segment and range of default risk must have enough grades within that range to avoid undue concentrations of Borrowers in particular grades. Significant concentrations within a single grade(s) 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.

For the banks using the Advanced Approach for estimating LGD, there is no specific minimum number of facility grades set out under this framework. 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.

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

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.

c) *Rating Definitions:-*

A bank must have 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. In this regard following points should be taken in to consideration:-

- 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 across lines of business, departments and geographic locations. 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 to SBP, for evaluation of 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.

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

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 supervisory rating categories. Appendix-3.1 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.

It may happen that the criteria that banks uses to assign exposures to internal grades might not perfectly align with criteria that define the supervisory categories; 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. Bank should take special care to ensure that any overrides of their internal criteria do not render the mapping process ineffective.

- d) **Time Horizon:-** Although the assessment horizon for PD estimates is one year, a longer time horizon may be used to assign ratings so that they are forward looking and banks are expected to use a longer time horizon in assigning ratings.

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.

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.

- e) **Model Requirements:-** The use of models to assign borrower or facility ratings or for estimations of PDs, LGDs or EADs is subject to a number of specific requirements.

Credit scoring models and other mechanical rating procedures generally use only a subset of available information. Although mechanical rating procedures may sometimes avoid some of the idiosyncratic errors made by rating systems in which human judgment plays a large role, mechanical use of limited information also is a source of rating errors. Credit scoring models and other mechanical procedures are permissible as the primary or partial basis of rating assignments, and may play a role in the estimation of loss characteristics. Sufficient human judgment and human oversight is necessary to ensure that all relevant and material information, including that which is outside the scope of the model, is also taken into consideration, and that the model is used appropriately.

It is the responsibility of the bank to satisfy SBP that a model or procedure has good predictive system 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 borrowers or facilities to which the bank is exposed and there must be no known material biases. For an effective modeling, the banks should:-

- Have 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 an approved rating.
- Have a system to ensure that the data used to build the model are representative of the population of the bank's actual borrowers or facilities.
- Take into account all relevant and material information not considered by the model, when combining model results with human judgment. The bank must have written guidance describing how human judgment and model results are to be combined.

- 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.
 - A regular cycle of model validation that includes monitoring of model performance and stability; review of model relationships; and testing of model outputs against outcomes.
- f) **Documentation:-** The rating system must be documented in writing, and both the system and documentation should demonstrate 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. The organization of rating assignment, including the internal control structure, must also be documented.

Banks must document the specific definitions of default and loss used internally and demonstrates consistency with the reference definitions. If the bank employs statistical models in the rating process, the bank must document their methodologies. This material must:

- Provide a detailed outline of the theory, assumptions and/or mathematical and 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.

Use of a model obtained from a third-party vendor that claims proprietary technology is not a justification for exemption from documentation or any other of the requirements for internal rating systems. The documentations should be proper and meaningful as envisaged earlier.

3.4.4. Risk Rating System Operations

The minimum requirement applicable to the rating process and the ratings system's environment relates to:

- a) Coverage of Ratings
- b) Integrity of Rating Process
- c) Procedure for Overrides
- d) Policies and Procedures

e) Sound Stress Testing

- a) **Coverage of Ratings:** - For corporate, sovereign, and bank exposures, each borrower and all recognized 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 pool as part of the loan approval process.

Each separate legal entity to which the bank is exposed must be separately rated. A bank must have policies in place 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.

- b) **Integrity of Rating Process:** - implies approval and periodic reviews of rating assignments by an independent party.

Standards for corporate, sovereign, and bank exposures

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 reviewed by SBP. These operational processes must be documented in the bank's procedures and incorporated into policies. Credit policies and underwriting procedures must reinforce and foster the independence of the rating process.

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.

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

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 timely review of a representative sample of exposures in the pool.

- c) **Procedure for Overrides:-** For rating assignments based on expert judgment, banks must clearly identify 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 judgment 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.

- d) ***Policies and Procedures:*** - A bank must collect and store data on key borrower and facility characteristics to provide effective support to its internal credit risk measurement and management process, to enable them to meet all the other requirements of this new capital framework, and to serve as a basis for SBP reporting. These data should be sufficiently detailed to allow retrospective reallocation of obligors and facilities to grades, e.g. if increasing sophistication of the internal rating system suggests that finer segregation of portfolios can be achieved. Furthermore, banks must collect and retain data on aspects of their internal ratings as required under the concept of Market Discipline of this framework.

For corporate, sovereign, and bank exposures

Banks must maintain rating histories on borrowers and recognized guarantors, including the first assigned internal grade rating of the borrower/guarantor, the dates when the ratings were assigned, the methodology and key data used to derive the rating and the details of the person responsible and the model used. The identity of defaulting borrowers and details of facilities granted to them, along with the timing and circumstances of such defaults must be retained in each and every case. Banks must also retain data on the PDs and realized default rates associated with rating grades and ratings migration in order to track the predictive power of the borrower rating system.

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 realized LGDs and EADs associated with each defaulted facility. Banks that reflect credit risk mitigating effects of guarantees/credit derivatives through LGD, they 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 actual time taken for the recovery, and administrative costs.

Banks under the Foundation Approach, which utilize SBP 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 realized losses for banks using the supervisory slotting criteria for SL).

For retail exposures

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 realized outcomes on LGD and EAD.

- e) ***Sound Stress Testing:*** - 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

unfavorable 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.

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 SBP review. The test to be employed must be meaningful and reasonably conservative. The banks may develop different approaches to undertaking this stress test requirement, depending on their circumstances. For this purpose, the objective is not to require banks to consider worst-case scenarios. The bank's stress test in this context should, however, consider at least the effect of mild 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 account – on a conservative basis – of the bank's international diversification (if any).

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, bank 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, bank should evaluate evidence of ratings migration in external ratings. This would include the bank broadly matching its buckets to rating categories.

3.4.5. Corporate Governance and Oversight

The involvement of the bank's board of directors and senior management is required, especially in three areas, which serve to reinforce one another:-

- i) Corporate Governance
- ii) Credit Risk Control
- iii) Audit System

- i) **Corporate Governance:** - All material aspects of the rating and estimation processes must be approved by the bank's board of directors or a designated committee thereof and senior management. These forums 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.

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.

Internal ratings must be an essential part of the reporting to senior management and the BOD or its committee for the purpose. Reporting must include risk profile by grade, migration across grades, estimation of the relevant parameters per grade, and comparison of realized 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.

- ii) **Credit Risk Control:-** Banks must have independent credit risk control units 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. Thus the banks must design this function according to size and complexity of their operations. The main areas of responsibility of such organizational setup 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 across departments and geographic areas;
- ✓ 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 supervisors to review.

A credit risk control unit must 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.

- iii) **Audit System:-** 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, LGDs and EADs. Areas of review include adherence to all applicable minimum requirements. Internal audit must document and keep track of its findings.

3.4.6. Use Test (Use of Internal Ratings)

Internal ratings, 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 desired. However, this usage test also has some specific implications:

- Banks may not necessarily be using the same estimates for IRB and internal purposes, they must document any difference(s) in such case and must be able to explain and demonstrate that estimates are reasonable.

- The use test implies the existence of a credible track record. The bank must demonstrate that it has been using its ratings system for at least three years prior to qualification for IRB recognition.

The estimates provided by the system must correspond to and be derived from homogeneous categories of exposure and homogeneous data.

3.4.7. Risk Quantification

Risk quantification is the process of assigning values to the main risk components (PD, LGD, EAD). The values must be estimated by the bank's system or be part of the supervisory (SBP) inputs, depending on which IRB subcategory the bank has qualified for. The risk quantification requirements are discussed at length in Section 3.6 "Quantification of Risk and Capital Requirement."

3.4.8 Disclosure Requirements

In order to be eligible for the IRB Approach, banks must meet the certain disclosure requirements. These requirements are issued separately in revised format of annual financial statements.

3.4.9 Validation of Internal Estimates

Banks must have a robust system in place to validate the accuracy and consistency of rating systems, processes, and the estimation of all relevant risk components. A bank must demonstrate to SBP that the internal validation process enables it to assess the performance of internal rating and risk estimation systems consistently and meaningfully. The requirements for the validation of Internal Estimates are as under:-

- a) Banks must regularly compare realized default rates with estimated PDs for each grade and be able to demonstrate that the realized default rates are within the expected range for that grade. Banks using the Advanced IRB Approach must 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. This analysis and documentation must be updated at least annually.
- b) 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.
- c) 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.
- d) Banks must have well-articulated internal standards for situations where deviations in realized 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

realized values continue to be higher than expected values, banks must revise estimates upward to reflect their default and loss experience.

Where banks rely on supervisory, rather than internal, estimates of risk parameters, they are encouraged to compare realized LGDs and EADs to those set by SBP. The information on realized LGDs and EADs should form part of the bank's internal assessment of capital.

3.5: Data Requirements

An internal ratings system is only as good as the data it uses and relies upon, so it is essential that the key risk components are well defined. There must be enough meaningful statistical observations so that the quality of risk assessments can lead to realistic estimates.

In order for an internal ratings system to be IRB compliant (that is, it is eligible to be used for regulatory capital purposes and, more generally, to deliver sound risk assessments), banks must collect substantial amounts of historical data.

Historical data refers to all data related to events that have affected exposures over a given period in the past. There are three different aspects related to historical data:

3.5.1 Quantity

There are two issues that have a bearing on the quantity of a bank's historical data. Firstly, a bank must collect data on key borrower and facility characteristics from whatever sources are available; and secondly, the data must be gathered over a period that is sufficient to provide meaningful comparison.

3.5.1.1 Gathering Data:-Traditionally, banks did not gather comprehensive data on its loan exposures in a methodical, organized manner. Although they were able to assess the relative credit quality of an exposure to a customer, they did not until recently quantify the various credit risk components (that is, PD, LGD and EAD) which, when taken together, constitute the elevated level of credit risk management required under the IRB Approaches.

To address the fact that banks have only recently begun to gather data systematically, Basel II allows banks to also use data derived from external sources. Banks must, however, demonstrate the relevance of such external data to their own exposures.

3.5.1.2 Sufficient Time Horizons:-To provide meaningful loss distributions, data must be gathered over a minimum period of time. This may also vary from one type of exposure to another. A minimum requirement of IRB states that PD estimates must be long-run averages of one-year realized default rates for borrowers in the grade (at least five years).

3.5.2 Quality

One of the prerequisites for a sound internal ratings system is that it should **accurately and consistently differentiate** between degrees of risk within a given rating category. Banks must ensure that data is consistent and homogeneous. This becomes particularly relevant when, for example, banks compare similar exposures that exist in different jurisdictions.

3.5.2.1 Rating Dimensions:-The challenge for banks is to define **clear and objective criteria** for their rating categories so that meaningful assessments can be made for both individual credit exposures (one loan to one borrower) and groups of exposures (several loans with different characteristics to one borrower). These so-called 'rating dimensions' are a minimum requirement under Basel II IRB framework. To qualify, a bank's internal ratings system must enable it to **rate and differentiate** between:

- exposures to different borrowers
- exposures with different characteristics but to the same borrower

3.5.3 Availability

Banks need a process that enables them to collect, store and use the historical data in a reliable manner. In practical terms:

- the bank's IT storage capacities must allow for storage of long-term data series
- collection must be done consistently throughout the banking organization

To implement a meaningful internal ratings system that is also IRB compliant, the bank's organization and information technology systems must adequately store and process data.

Bank staff must be qualified to implement and maintain the organizational and information systems that relate to managing and processing data.

3.6: Quantification of Risk and Capital Requirements

3.6.1 General Requirements

PD estimates must be a long-run average of one-year default rates for borrowers in the grade, with the exception of retail exposures (see below). Requirements specific to PD estimation are described. Banks on the Advanced Approach must estimate an appropriate LGD for each of its facilities (or retail pools). Banks on the Advanced Approach must also estimate an appropriate long run default-weighted average EAD for each of its facilities. For corporate, sovereign and bank exposures, banks that do not meet the requirements for own estimates of EAD or LGD, discussed in this chapter, must use the supervisory estimates of these parameters

Internal estimates of PD, LGD, and EAD must incorporate all relevant, material and available data, information and methods. A bank may utilize 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.

Estimates must be grounded in historical experience and empirical evidence as well, 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.

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 exposures and standards. The bank must also demonstrate that economic or market conditions that

underlie the data are relevant to current and foreseeable conditions. 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.

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. SBP may allow some flexibility in application of the required standards for data that are collected prior to the date of implementation of this Framework after due authentications and validation. However, in such cases banks must demonstrate to SBP 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.

3.6.2 Re-ageing

The bank must have clearly articulated and documented policies in respect of the counting of days past due, in particular in respect of the re-ageing of the facilities and the granting of extensions, deferrals, renewals and rewrites to existing accounts. At a minimum, the re-ageing policy must include:-

- a) Approval authorities and reporting requirements;
- b) Minimum age of a facility before it is eligible for re-ageing;
- c) Delinquency levels of facilities that are eligible for re-ageing;
- d) Maximum number of re-ageings per facility; and
- e) A reassessment of the borrower's capacity to repay.

These policy ingredients must be applied consistently over the time, and must support the 'use test' (i.e. if a bank treats a re-aged exposure in a similar fashion to other delinquent exposures more than the past-due cut off point, this exposure must be recorded as in default for IRB purposes).

3.6.3 Treatment of overdrafts

Overdrafts should be properly authorized and must be subject to a credit limit set by the bank and be brought to the knowledge of the borrower. Any excess over such limit must be monitored; if the account were not brought under the limit after 90 days (subject to the applicable past-due trigger), it would be considered as defaulted. Non-authorized overdrafts will be associated with a zero limit for IRB purposes. Thus, days past due commence once any credit is granted to an unauthorized 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.

3.6.4 Definition of loss for all asset classes

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.

3.6.5 Specific Requirements for PD Estimation

a) Corporate, sovereign and bank exposures

For corporate and bank exposures, the PD is the greater of the one-year PD associated with the internal borrower grade to which that exposure is assigned, or 0.03%. For sovereign exposures, the PD is the one-year PD associated with the internal borrower grade to which that exposure is assigned. The PD of borrowers assigned to a default grade(s), consistent with the reference definition of default, is 100%. The minimum requirements for the derivation of the PD estimates associated with each internal borrower grade are outlined hereinafter.

Banks may have a primary technique and use others as a point of comparison and potential adjustment. There should not be mechanical application of a technique without supporting analysis. Banks must recognize the importance of judgmental considerations in combining results of techniques and in making adjustments for limitations of techniques and information

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

- A bank 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 recognized. A bank must demonstrate that the internal rating systems and criteria of other banks in the pool are comparable with its own.
- Banks may associate or map their internal grades to the scale used by an external credit assessment institution or similar institution and then attribute the default rate observed for the external institution's grades to their grades. Mappings must be based on a comparison of internal rating criteria to the criteria used by the external institution 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 institution'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 include a comparison of the default definitions used, subject to the requirements as identified under the Section 3.1. The bank must document the basis for the mapping.

- A bank is allowed to use a simple average of default-probability estimates for individual borrowers in a given grade, where such estimates are drawn from statistical default prediction models.

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 at least five years for at least one source. 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.

b) *Retail Exposure*

The PD for retail exposures is the greater of the one year PD associated with the internal borrower grade to which the pool of retail exposures is assigned OR 0.03%

Given the institution-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 institution's process of assigning exposures to a pool and the process used by the external data source, and (b) between 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.

One method for deriving long-run average estimates of PD and default-weighted average loss rates given default (as defined in under the title specific requirement of LGD estimation for all asset classes) for retail would be based on an estimate of the expected long-run loss rate. A bank may:-

1. Use an appropriate PD estimate to infer the long-run default-weighted average loss rate given default, or
2. Use a long-run default-weighted average loss rate given default to infer the appropriate PD.

In either case, it is important to recognize that the LGD used for the IRB capital calculation cannot be less than the long-run default-weighted average loss rate given default and must be consistent with the concepts defined in paragraph 3.6.6 (a) below.

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.

The seasoning can be quite material for some long-term retail exposures characterized 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 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.

3.6.6 Specific Requirements for own-LGD Estimation

a) Standards for all asset classes

A bank must estimate an LGD for each facility that aims to reflect economic downturn conditions where necessary to capture the relevant risks. This LGD should not be less than the long-run default-weighted average loss rate given default calculated based on the average economic loss of all observed defaults within the data source for that type of facility. In addition, a bank must take into account the potential for the LGD of the facility to be higher than the default-weighted average during a period when credit losses are substantially higher than average. For certain types of exposures, loss severities may not exhibit such cyclical variability and LGD estimates may not differ materially (or possibly at all) from the long-run default-weighted average. However, for other exposures, this cyclical variability in loss severities may be important and banks will need to incorporate it into their LGD estimates. For this purpose, banks may use averages of loss severities observed during periods of high credit losses, forecasts based on appropriately conservative assumptions, or other similar methods. Appropriate estimates of LGD during periods of high credit losses might be formed using either internal and/or external data.

In the 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.

LGD estimates must be based on historical recovery rates and, when applicable, and should not be solely based on the collateral's estimated market value. This requirement recognizes 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 that are generally consistent with those required for the Standardized Approach.

Recognizing the principle that realized losses can at times systematically exceed expected levels, the LGD assigned to a defaulted asset should reflect the possibility that the bank would have to recognize additional, unexpected losses during the recovery period. For each defaulted asset, the bank must also construct its best estimate of the expected loss on that asset based on current 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. 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 will attract supervisory scrutiny and must be justified by the bank.

b) Additional Standards for corporate, sovereign, and bank exposures

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.

Treatment of unsecured claims and non-recognized collaterals:- Under the Foundation Approach, senior claims on corporates, sovereigns and banks not secured by recognized collateral should be assigned a 45% LGD. Whereas, all subordinated claims on corporate, sovereigns and bank should be assigned a 75% LGD. A subordinated loan is a facility that is expressly subordinated to another facility. The collateralized portions of the said exposures are discussed separately.

c) Additional standards for retail exposures

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 SBP that more recent data are a better predictor of loss rates.

3.6.7 Requirements specific to own-EAD estimates

a) Standards for all asset classes

EAD for an on-balance sheet or off-balance sheet item is defined as the expected gross exposure of the facility upon default of the obligor. For on-balance sheet items, banks must estimate EAD at no less than the current drawn amount, subject to recognizing the effects of on-balance sheet netting. 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, therefore, focus on the estimation of EAD for off-balance sheet items (excluding derivatives). Advanced Approach 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.

Advanced Approach 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.

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.

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 may consider monitoring outstanding balances on a daily basis.

For the transactions that expose banks to counterparty credit risk, estimates of EAD must fulfill the respective requirements. Similarly measures of exposures for Securities Financing Transactions (SFT's) and OTC Derivatives that exposes banks to counterparty credit risk under IRB Approach should be calculated either by using Standardized Approach or Internal Models Approach.

Exposure measurement for on-balance sheet items:- On-balance sheet netting of loans and deposits should be recognized subject to the same conditions as in case of Standardized Approach described in Chapter-2.

Exposure measurement for off-balance sheet items:- For off-balance sheet items, exposure is calculated as the committed but undrawn amount multiplied by the "Credit Conversion Factors (CCF)."

EAD under the Foundation Approach:- The types of instruments and the CCF's applied to them are the same as those in the Standardized Approach as outlined in Section 2.5.1 and Table-2.4 with the exception of commitments, Note Issuance Facilities (NIFs), and Revolving Underwriting Facilities (RUF). 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 cancelable, 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.

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 line monitoring and management procedures to support this contention.

In order to apply a 0% CCF for unconditionally and immediately cancelable 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 deterioration in the credit quality of the borrower. Where a commitment is obtained on another off-balance sheet exposure, banks under the Foundation Approach are to apply the lower of the applicable CCFs.

EAD under the Advanced Approach:- Banks which meet the minimum requirements for use of their own estimates are allowed to use their own internal estimates of CCFs across different product types provided the exposure is not subject to a CCF of 100% in the Foundation Approach.

b) Additional standards for corporate, sovereign, and bank exposures

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.

c) Additional standards for retail exposures

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 needs not give equal importance to historic data if it can demonstrate to SBP that more recent data are a better predictor of draw downs.

Both on and off-balance sheet retail exposures are measured gross of specific provisions or partial write-offs. The EAD on drawn amounts should not be less than the sum of (i) the amount by which a bank's regulatory capital would be reduced if the exposure were written-off fully, and (ii) any specific provisions and partial write-offs. When the difference between the instrument's EAD and the sum of (i) and (ii) is positive, this amount is termed a discount. The calculation of risk-weighted assets is independent of any discounts. Such discounts are discouraged to be included in the total eligible provisions.

On-balance sheet netting of loans and deposits of a bank to or from a retail customer are permitted subject to the conditions similar to those in Standardized Approach.

For retail exposures with uncertain future drawdown such as credit cards, banks must take into account their history and/or expectation of additional drawings prior to default in their overall calibration of loss estimates. In particular, where a bank does not reflect conversion factors for undrawn lines in its EAD estimates, it must reflect in its LGD estimates the likelihood of additional drawings prior to default. Conversely, if the bank does not incorporate the possibility of additional drawings in its LGD estimates, it must do so in its EAD estimates.

When only the drawn balances of retail facilities have been securitized, banks must ensure that they continue to hold required capital against their share (i.e. seller's interest) of undrawn balances related to the securitized exposures using the IRB Approach to credit risk. This means that for such facilities, banks must reflect the

impact of CCFs in their EAD estimates rather than in the LGD estimates. For determining the EAD associated with the seller's interest in the undrawn lines, the undrawn balances of securitized exposures would be allocated between the seller's and investors' interests on a pro rata basis, based on the proportions of the seller's and investors' shares of the securitized drawn balances.

3.6.8 Effective Maturity (M) (Corporate, Sovereign and Bank Exposures)

- (a) For banks using the Foundation Approach for corporate exposures, effective maturity (M) will be 2.5 years except for repo-style transactions where the effective maturity will be 6 months.
- (b) Banks using any element of the Advanced IRB Approach are required to measure effective maturity for each facility as defined below. However, facilities to smaller domestic corporate borrowers if the reported sales (i.e. turnover) for the consolidated group of which the firm is a part of, are less than PKR 300 million are exempt from the explicit maturity adjustment. The consolidated group has to be a domestic company based in Pakistan. This exemption is available to all the IRB banks using the Advanced Approach. All exposures to such qualifying smaller domestic firms should be assumed to have an average maturity of 2.5 years, as under the Foundation IRB Approach.
- (c) 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:

$$\text{Effective Maturity (M)} = \frac{\sum_t t * CF_t}{\sum_t CF_t}$$

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

- 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 maturity of the instrument.
 - For derivatives subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment. Further, the notional amount of each transaction should be used for weighting the maturity.
- (d) The one-year floor does not apply to certain short-term exposures, comprising fully or nearly-fully collateralized 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 remargining 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 above).

(e) In addition to the transactions mentioned 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 an obligor may be eligible for exemption from the one-year floor. The short-term exposures that satisfy the criteria provided in the preceding paragraphs may include:-

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

For transactions falling within the scope as mentioned at (d) above and are subject to a master netting agreement, 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 Table 2.8 and described thereafter in Section 2.6.3.2 (c) 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.

3.6.9 Computation of Risk Weighted Assets and Capital Requirement for Corporate, Sovereign and Bank Exposures.

The derivation of risk-weighted assets is dependent on estimates of the PD, LGD, EAD and in some cases, effective maturity (M) for given exposure (3.6.8 above). This has been discussed earlier. The PD and LGD are measured as decimals, and EAD is measured as currency (Rupees) except where explicitly noted otherwise.

For exposures not in default the formula for calculating risk weighted is

$$\begin{aligned} \text{Correlation (R)} &= 0.12 \times (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50)) \\ &\quad + 0.24 \times [1 - (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50))] \\ \text{Maturity} \\ \text{Adjustment (b)} &= (0.11852 - 0.05478 \times \ln(\text{PD}))^2 \\ \text{Capital} \\ \text{Requirement* (K)} &= [\text{LGD} \times \text{N}[(1 - \text{R})^{-0.5} \times \text{G}(\text{PD}) + (\text{R} / (1 - \text{R}))^{0.5} \times \text{G}(0.999)] \\ &\quad - \text{PD} \times \text{LGD}] \times (1 - 1.5 \times \text{b})^{\wedge} - 1 \times (1 + (\text{M} - 2.5) \times \text{b}) \end{aligned}$$

*If this calculation results in a negative capital charge for any individual exposure, bank should apply a zero capital charge for that exposure

Risk Weighted Assets [RWA] = K x 12.5 x EAD

Where

“R” is assumed asset correlation for the exposure

“K” is minimum capital requirement expressed as a percentage of EAD for the exposure.

“b” is Maturity Adjustment

“M” is Remaining Effective Maturity which is subject to maximum 5 years as described above

“LGD” is Loss Given Default of the exposure

“PD” is one-year Probability of Default of the borrower of the exposure

“N(x)” is Normal Cumulative Distribution

“G(z)” is Inverse Normal Cumulative Distribution.

a) Firm Size Adjustment for Small and Medium Sized entities (SME)

Under the IRB Approach for corporate credits, banks will be permitted to separately distinguish exposures to SME borrowers (defined as corporate exposures where the reported sale for the consolidated group of which the firm is a part is less than PKR 300 million). A firm-size adjustment (i.e. $0.04 \times (1 - (S-50)/250)$) is made to the corporate risk weight formula for exposures to SME borrowers. S is expressed as total annual sales in millions of Rupees with values of S falling in the range of equal to or less than PKR 300 million or greater than or equal to PKR 50 million. Reported sales of less than PKR 50 million will be treated as if they were equivalent to PKR 50 million for the purposes of the firm-size adjustment for SME borrowers. This firm size adjustment is indicative and may evolve and would be reconsidered in due course of time.

$$\text{Correlation (R)} = 0.12 \times (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50)) + 0.24 \times [1 - (1 - \text{EXP}(-50 \times \text{PD})) / (1 - \text{EXP}(-50))] - 0.04 \times (1 - (S-50)/250)$$

b) Risk Weights for Specialized Lending PF; OF; CF; and IPRE

Banks that do not meet the requirements for the estimation of PD under the corporate IRB Approach will be required to map their internal grades to five supervisory categories, each of which is associated with a specific risk weight. The slotting criteria on which this mapping must be based are provided in Appendix-3.1. The risk weights for unexpected losses associated with each supervisory category are:

Strong	Good	Satisfactory	Weak	Default
70%	90%	115%	250%	0%

Banks would be allowed to assign preferential risk weights after SBP determines through validation process that banks’ underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria for the relevant supervisory risk category.

Although banks are expected to map their internal ratings to the supervisory categories for specialized lending using the slotting criteria provided in Appendix-3.1, each supervisory category broadly corresponds to a range of external credit assessments as outlined below.

Strong	Good	Satisfactory	Weak	Default
BBB- or better	BB+ or BB	BB- or B+	B to C-	N/A

All banks that meet the requirements for the estimation of PD can use the general Foundation Approach for the corporate asset class to derive risk weights for SL sub-classes.

Banks that meet the requirements for the estimation of PD and LGD / or EAD will be able to use the general Advanced Approach for the corporate asset class to derive risk weights for SL sub-classes.

c) Risk Weights for HVCRE

Banks that do not meet the requirements for estimation of PD for HVCRE, must map their internal grades to five supervisory categories, each of which is associated with a specific risk weight. The slotting criteria on which this mapping must be based are the same as those for IPRE, as provided in Appendix-3.1. The UL risk weights associated with each category are:

Strong	Good	Satisfactory	Weak	Default
95%	120%	140%	250%	0%

As indicated in Section 3.6.9 (b), each supervisory category broadly corresponds to a range of external credit assessments.

Banks would be allowed to assign preferential risk weights after SBP determines through validation process that banks' underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria for the relevant supervisory risk category as mentioned in Appendix-3.1

Banks that meet the requirements for the estimation of PD and SBP has allowed them to implement a Foundation or Advanced Approach to HVCRE exposures will use the same formula for the derivation of risk weights that is used for other SL exposures, except that they will apply the following asset correlation formula:-

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

Banks that do not meet the requirements for estimation of LGD and EAD for HVCRE exposures must use SBP parameters for LGD and EAD for corporate exposures.

(d) Recognition of guarantees and credit derivatives:

Consistent with requirements mentioned in Section 3.6.10 (iv) for corporate, sovereign and bank exposures, banks must not include the effect of double default in such adjustments. The adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider. Consistent with the Standardized Approach, banks may choose not to recognize credit protection if doing so would result in higher capital requirement.

3.6.10 Computation of Risk Weighted Assets and Capital Requirement for Retail Exposures.

There are three separate risk-weight functions for retail exposures, Risk weights for retail exposures are based on separate assessments of PD and LGD as inputs to the risk-weight functions. None of the three retail risk-weight functions contains an explicit maturity adjustment. Throughout this section, PD and LGD are measured as decimals, and EAD is measured as currency i.e. Rupees.

- i) **Residential Mortgage Exposures:-** For the exposures that are not in default and are secured or partly secured by residential mortgages, risk weights will be assigned based on the following formula:-

Risk-weighted assets = K x 12.5 x EAD

$$\text{Capital Requirement (K)} = \text{LGD} \times N[(1-R)^{-0.5} \times G(\text{PD}) + (R/(1-R))^{0.5} \times G(0.999)] - \text{PD} \times \text{LGD}$$

$$\text{Correlation (R)} = 0.15$$

The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD and the bank's best estimate of expected loss. The risk-weighted asset amount for the defaulted exposure is the product of K, 12.5, and the EAD. It shall be noted that risk weights for residential mortgages also apply to the unsecured portion of such residential mortgages.

- ii) **Qualifying revolving retail exposures:-** For qualifying revolving retail exposures that are not in default, risk weights are defined based on the following formula:-

Risk-weighted assets = K x 12.5 x EAD

$$\text{Capital requirement (K)} = \text{LGD} \times N[(1 - R)^{-0.5} \times G(\text{PD}) + (R / (1 - R))^{0.5} \times G(0.999)] - \text{PD} \times \text{LGD}$$

$$\text{Correlation (R)} = 0.04$$

The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD and the bank's best estimate of expected loss. The risk-weighted asset amount for the defaulted exposure is the product of K, 12.5, and the EAD.

- iii) **Other Retail Exposures:-** For all other retail exposures that are not in default, risk weights are assigned based on the following function which also allow the correlation to vary with PD.

Risk-weighted assets = K x 12.5 x EAD

$$\text{Capital requirement (K)} = \text{LGD} \times N[(1 - R)^{-0.5} \times G(\text{PD}) + (R / (1 - R))^{0.5} \times G(0.999)] - \text{PD} \times \text{LGD}$$

$$\text{Correlation (R)} = 0.03 \times (1 - \text{EXP}(-35 \times \text{PD})) / (1 - \text{EXP}(-35)) + 0.16 \times [1 - (1 - \text{EXP}(-35 \times \text{PD})) / (1 - \text{EXP}(-35))]$$

The capital requirement (K) for a defaulted exposure is equal to the greater of zero and the difference between its LGD and the bank's best estimate of expected loss. The risk-weighted asset amount for the defaulted exposure is the product of K, 12.5, and the EAD.

- iv) **Recognition of Guarantees and Credit Derivatives:-** Banks may reflect the risk-reducing effects of guarantees and credit derivatives either in support of an individual obligation or pool of exposures, through an adjustment of either the PD or LGD estimates, subject to the requirements mentioned in Section 3.7.8. Whether adjustments are done through PD or LGD, they must be done on a consistent manner for a given guarantee or credit derivative.

3.6.11 Rules for Equity Exposures

3.6.11.1. Risk-weighted assets for equity exposures

Risk-weighted assets for equity exposures in the trading book are subject to the market risk capital rules. There are two approaches to calculate risk-weighted assets for equity exposures not held in the trading book: a Market-based Approach and a PD/LGD Approach. Banks can adopt either of the approaches depending upon their system of risk assessment and management. Once bank has decided to adopted any particular approach there must be a consistency in its applications. Certain equity holdings are excluded as defined in paragraphs “exclusions to the market based and PD / LGD Approaches” as described below, and are subject to the capital charges required under the Standardized Approach.

(i) Market-based Approach

Under the market-based Approach, banks are permitted to calculate the minimum capital requirements for their banking book equity holdings using one or both of two separate and distinct methods: a simple risk weight method or an internal models method. The method used should be consistent with the amount and complexity of the institution’s equity holdings and commensurate with the overall size and sophistication of the institution. SBP requires the use of either method based on the individual circumstances of an institution. Banks are permitted to recognize guarantees but not collateral obtained on an equity position wherein the capital requirement is determined through use of the market based approach. A bank may employ different market-based approaches to different portfolios based on appropriate considerations and where the bank itself uses different approaches internally.

- a) **Simple risk weight method**:-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 security traded on a recognized security exchange.

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

- b) **Internal models method**:-IRB banks may use internal risk measurement models to calculate the risk-based capital requirement. Under this alternative, banks must hold capital equal to the potential loss on the institution’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 an institution’s risk-based capital ratio through the calculation of risk-weighted equivalent assets. The risk weight used to convert holdings into risk-weighted equivalent assets would be calculated by multiplying the derived capital charge by

12.5 (i.e. the inverse of the minimum 8% risk-based capital requirement). 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. The requirements of Internal Models Approach is set out in the Appendix-3.2

(ii) PD/LGD Approach

- a) The minimum requirements and methodology for the PD/LGD Approach for equity exposures (including equity of companies that are included in the retail asset class) are the same as those for the IRB Foundation Approach for corporate exposures subject to the following specifications, *however, it should be noted that there is no Advanced Approach for equity exposures, given the 90% LGD assumptions:-*
 - 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 the PD of a corporate entity where the bank holds debt. *In practice, if there is both an equity exposure and an IRB credit exposure to the same counterparty, a default on the credit exposure would thus trigger a simultaneous default for regulatory purposes on the equity exposure.* If a bank does not hold debt of the company in whose equity it has invested, and does not have sufficient information on the position of that company to be able to use the applicable definition of default in practice but meets the other standards, a 1.5 scaling factor will be applied to the risk weights derived from the corporate risk-weight function, given the PD set by the 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.
 - An LGD of 90% would be assumed in deriving the risk weight for equity exposures.
 - For these purposes, the risk weight is subject to a five-year maturity adjustment whether or not the bank is using the explicit approach to maturity elsewhere in its IRB portfolio.
- b) Under the PD/LGD Approach, minimum risk weights as set out in paragraphs below would apply. When the sum of UL and EL associated with the equity exposure results in less capital than would be required from applying the minimum risk weight, the minimum risk weights must be used. In other words, the minimum risk weights must be applied, if the risk weights calculated according to above paragraphs plus the EL associated with the equity exposure multiplied by 12.5 are smaller than the applicable minimum risk weights.
- c) 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:-
 - Public equities where the investment is part of a long-term customer relationship, any capital gains are not expected to be realized in the short term

and there is no anticipation of (above trend) capital gains in the long term. It is expected that in almost all the cases, the institution 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).

- Private equities where the returns on the investment are based on regular and periodic cash flows not derived from capital gains and there is no expectation of future (above trend) capital gain or of realizing any existing gain.
- d) For all other equity positions, including net short positions (as described under paragraph “(a) simple risk weight method” under market based approach described earlier), 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.
- e) The maximum risk weight for the PD/LGD Approach for equity exposures is 1250%. This maximum risk weight can be applied, if risk weights calculated according to (a) of (ii) PD/LGD Approach above, plus the EL associated with the equity exposure multiplied by 12.5 exceed the 1250% risk weight. Alternatively, banks may deduct the entire equity exposure amount, assuming it represents the EL amount, 50% from Tier 1 capital and 50% from Tier 2 capital.
- f) Hedging for PD/LGD equity exposures is similar as for corporate exposures, subject to an LGD of 90% on the exposure to the provider of the hedge. For these purposes equity positions will be treated as having a five-year maturity.

iii) Exclusions to the market-based and PD/LGD Approaches

- a) Equity holdings in entities whose debt obligations qualify for a zero risk weight under the Standardized Approach to credit risk can be excluded from the IRB Approaches to equity (including those publicly sponsored entities where a zero risk weight can be applied), at the discretion of SBP and such an exclusion would be available to all banks.
- b) To promote specified sectors of the economy, SBP may exclude from the IRB capital charges equity holdings made under legislated programs that provide significant subsidies for the investment to the bank and involve some form of government oversight and restrictions on the equity investments. Example of restrictions are limitations on the size and types of businesses in which the bank is investing, allowable amounts of ownership interests, geographical location and other pertinent factors that limit the potential risk of the investment to the bank. Equity holdings made under legislated programs can only be excluded from the IRB Approaches up to an aggregate of 10% of Tier 1 plus Tier 2 capital.
- c) SBP 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 their aggregate value, excluding all legislative programs discussed in the preceding paragraph, exceeds, on average over the prior year, 10% of bank's Tier 1 plus Tier 2 capital. This materiality threshold is lowered to 5% of a bank's Tier

1 plus Tier 2 capital if the equity portfolio consists of less than 10 individual holdings.

3.6.11.2. Risk Components

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 unrealized revaluation gains. Thus, for example, equity exposure measures will be:-

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

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. *This does not affect the existing allowance of 45% of unrealized gains to Tier-2 capital in the 1988 Accord.*

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.

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.

3.6.12 Rules for Purchased Receivables

3.6.12.1. Risk-weighted assets for default risk

For receivables belonging unambiguously to one asset class, the IRB risk weight for default risk is based on the risk-weight function applicable to that particular exposure type, as long as the bank can meet the qualification standards for this particular risk-weight function. For example, if banks cannot comply with the standards for qualifying revolving retail exposures, they should use the risk-weight function for other retail exposures. For hybrid pools containing mixtures of exposure types, if the purchasing bank cannot separate the exposures by type, the risk-weight function producing the highest capital requirements for the exposure types in the receivable pool applies.

(i) Purchased retail receivables

For purchased retail receivables, a bank must meet the risk quantification standards for retail exposures but can utilize external and internal reference data to estimate the PDs and LGDs. The estimates for PD and LGD (or EL) must be calculated for the

receivables on a stand-alone basis; that is, without regard to any assumption of recourse or guarantees from the seller or other parties.

(ii) Purchased corporate receivables

For purchased corporate receivables the purchasing bank is expected to apply the existing IRB risk quantification standards for the bottom-up approach. However, for eligible purchased corporate receivables, and subject to supervisory permission, a bank may employ the following top-down procedure for calculating IRB risk weights for default risk:

- The purchasing bank will estimate the pool's one-year EL for default risk, expressed in percentage of the exposure amount (i.e. the total EAD amount to the bank by all obligors in the receivables pool). The estimated EL must be calculated for the receivables on a stand-alone basis; that is, without regard to any assumption of recourse or guarantees from the seller or other parties. The treatment of recourse or guarantees covering default risk (and/or dilution risk) is discussed separately below.
- Given the EL estimate for the pool's default losses, the risk weight for default risk is determined by the risk-weight function for corporate exposures. In this regard firm-size adjustment for SME, would be weighted average by individual exposure of the pool of purchased corporate receivables. If bank does not have the information to calculate the average size of the pool, the firm-size adjustment would not apply. As described below in Sections 3.6.12.2 & 3, the precise calculation of risk weights for default risk depends on the bank's ability to decompose EL into its PD and LGD components in a reliable manner. Banks can utilize external and internal data to estimate PDs and LGDs. However, the Advanced Approach would not be available for banks that use the Foundation Approach for corporate exposures.

3.6.12.2 Treatment of purchased receivables under Foundation IRB

If the purchasing bank is unable to decompose EL into its PD and LGD components in a reliable manner, the risk weight is determined from the corporate risk-weight function using the following specifications: if the bank can demonstrate that the exposures are exclusively senior claims to corporate borrowers, an LGD of 45% can be used. PD will be calculated by dividing the EL using this LGD. EAD will be calculated as the outstanding amount minus the capital charge for dilution prior to credit risk mitigation ($K_{Dilution}$). Otherwise, PD is the bank's estimate of EL; LGD will be 100%; and EAD is the amount outstanding minus $K_{Dilution}$. EAD for a revolving purchase facility is the sum of the current amount of receivables purchased plus 75% of any undrawn purchase commitments minus $K_{Dilution}$. 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 for LGD, M and the treatment of guarantees under the Foundation Approach.

3.6.12.3 Treatment of purchased receivables under Advanced IRB

If the purchasing bank can estimate either the pool's default-weighted average loss rates given default or average PD in a reliable manner, the bank may estimate the other

parameter based on an estimate of the expected long-run loss rate. The bank may (i) use an appropriate PD estimate to infer the long-run default-weighted average loss rate given default, or (ii) use a long-run default-weighted average loss rate given default to infer the appropriate PD. In either case, it is important to recognize that the LGD used for the IRB capital calculation for purchased receivables cannot be less than the long-run default-weighted average loss rate given default and must be consistent with the defined concepts. The risk weight for the purchased receivables will be determined using the bank's estimated PD and LGD as inputs to the corporate risk-weight function. Similar to the Foundation IRB treatment, EAD will be the amount outstanding minus $K_{Dilution}$. EAD for a revolving purchase facility will be the sum of the current amount of receivables purchased plus 75% of any undrawn purchase commitments minus $K_{Dilution}$ (thus, banks using the Advanced IRB Approach will not be permitted to use their internal EAD estimates for undrawn purchase commitments).

For drawn amounts, M (Maturity) will equal the pool's exposure-weighted average effective maturity. This same value of M will also be used for undrawn amounts under a committed purchase facility provided the facility contains effective covenants, early amortization triggers, 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. Absent such effective protections, 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.

3.6.12.4. Specific Requirements of estimating PD and LGD (or EL) for qualifying "Purchased Receivables."

The minimum requirements mentioned in the next paragraph is for the risk quantification and 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 would 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 of dilution losses can be determined. In general, the risk bucketing process should 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.

Minimum operational requirements:-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 would 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 systems:-* 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 program 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, early amortization triggers, 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 servicer's 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 program, 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 the 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 program.
- 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.

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.

3.6.12.5. Risk-weighted assets for dilution risk

Dilution refers to the possibility that the receivable amount is reduced through cash or non-cash credit to the receivables obligor. *Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the borrowers to a receivable obligor, and payment or promotional discounts offered by the borrower (e.g. credit for cash payments within 30 days).* For both corporate and retail receivables, unless the bank can demonstrate to SBP that the dilution risk for the purchasing bank is immaterial, the treatment of dilution risk must be the following: at the

level of either the pool as a whole (top-down approach) or the individual receivables making up the pool (bottom-up approach), the purchasing bank will estimate the one-year EL for dilution risk, also expressed in percentage of the receivables amount. Banks can utilize external and internal data to estimate EL. As with the treatments of default risk, this estimate must be computed on a stand-alone basis; that is, under the assumption of no recourse or other support from the seller or third-party guarantors. For the purpose of calculating risk weights for dilution risk, the corporate risk-weight function must be used with the following settings: the PD must be set equal to the estimated EL, and the LGD must be set at 100%. An appropriate maturity treatment applies when determining the capital requirement for dilution risk. If a bank can demonstrate that the dilution risk is appropriately monitored and managed to be resolved within one year, SBP may allow the bank to apply a one-year maturity.

This treatment should be applied regardless of whether the underlying receivables are corporate or retail exposures, and regardless of whether the risk weights for default risk are computed using the standard IRB treatments or, for corporate receivables, the top-down treatment described above.

3.6.13 Expected Losses and Recognition of Provisions

3.6.13.1 Calculation of Expected Losses

A bank must sum the EL amount (defined as EL multiplied by EAD) associated with its exposures (excluding the EL amount associated with equity exposures under the PD/LGD Approach and securitized exposures) to obtain a total EL amount. While the EL amount associated with equity exposures subject to the PD/LGD Approach is excluded from the total EL amount. Paragraphs (i) below and 2nd Para of 3.6.13.3 apply to such exposure.

(i) Expected loss for exposures other than SL subject to the supervisory slotting criteria.

Banks must calculate an EL as PD x LGD for corporate, sovereign, bank, and retail exposures not in default and 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 paragraphs of “requirement specific to own-LGD estimates” and banks on the Foundation Approach must use the supervisory LGD. For SL exposures subject to the slotting criteria EL is calculated as described in paragraph below. For equity exposures subject to the PD/LGD Approach, the EL is calculated as PD x LGD unless specific provisions mentioned in Section 3.6.11.1(ii)(b) to (e) apply. The securitization exposures do not contribute to the EL amount, as set out in 4.3.1.1 (c). For all other exposures, including hedged exposures under the double default treatment, the EL is zero.

(ii) Expected loss for SL exposures subject to the supervisory slotting criteria

For SL exposures subject to the supervisory slotting criteria, the EL amount is determined by multiplying 8% by the risk-weighted assets produced from the appropriate risk weights, as specified below, multiplied by EAD. The risk weights for SL, other than HVCRE, are as follows:

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

Banks may be allowed to assign preferential risk weights to other SL exposures falling into the “strong” and “good” supervisory categories after it has been established that bank’s underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria mentioned in Appendix-3.1

For HVCRE the supervisory slotting criterion is as under:-

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

3.6.13.2 Calculation of Provisions

(i) Exposures subject to IRB Approach

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 securitization exposures must not be included in total eligible provisions.

Under the internal ratings-based (IRB) Approach, the treatment of 1988 accord to include general provisions (or general loss reserve) in Tier-2 is withdrawn. Where the total expected loss (EL) amount exceeds total eligible provisions described above, banks must deduct the difference from the regulatory capital. Deduction must be 50% from Tier-1 and 50% from Tier-2. Where the total expected loss amount is less than total eligible provisions, banks may recognize the difference in Tier-2 capital up to a maximum of 0.6% of credit risk weighted assets.

(ii) Portion of exposures subject to the Standardized Approach to credit risk

Banks should generally attribute total general provisions on a pro rata basis according to the proportion of credit risk-weighted assets subject to the standardized and IRB Approaches. However, when one approach to determining credit risk-weighted assets (i.e. Standardized or IRB Approach) is used exclusively within an entity, general provisions booked within the entity using the Standardized Approach may be attributed to the standardized treatment.

3.6.13.3 Treatment of EL and Provisions

Where the calculated EL amount is lower than the provisions of the bank, it would be determined by SBP through supervisory review process as to whether the EL fully reflects the conditions in the market in which bank operates before allowing the difference to be included in Tier 2 capital. If specific provisions exceed the EL amount on defaulted assets, assessment would also be made before formally allowing the use of the difference to offset the EL amount on non-defaulted assets.

The EL amount for equity exposures under the PD/LGD Approach is deducted 50% from Tier 1 and 50% from Tier 2. Provisions or write-offs for equity exposures under the PD/LGD Approach will not be used in the EL-provision calculation.

3.6.14. Double Default

3.6.14.1 Operational requirements for recognition of double default

- (i) A bank using an IRB Approach has the option of using the substitution approach in determining the appropriate capital requirement for an exposure. However, for exposures hedged by one of the following instruments the double default framework according to Section 3.6.14.2 may be applied by the banks subject to the additional operational requirements described below. A bank may decide separately for each eligible exposure to apply either the double default framework or the substitution approach.
 - (a) Single-name, unfunded credit derivatives (e.g. credit default swaps) or single-name guarantees.
 - (b) First-to-default basket products - the double default treatment will be applied to the asset within the basket with the lowest risk-weighted amount.
 - (c) nth-to-default basket products - the protection obtained is only eligible for consideration under the double default framework if eligible (n-1)th default Protection has also been obtained or where (n-1) of the assets within the basket have already defaulted.
- (ii) The double default framework is only applicable where the following conditions are met:-
 - (a) The risk weight that is associated with the exposure prior to the application of the framework does not already factor in any aspect of the credit protection.
 - (b) The entity selling credit protection is a bank¹⁹, investment firm or insurance company (but only those that are in the business of providing credit protection, including mono-lines, re-insurers, and non-sovereign credit export agencies²⁰), referred to as a financial firm, that:
 - is regulated in a manner broadly equivalent to that in this Framework (where there is appropriate supervisory oversight and transparency/ market discipline), or externally rated as at least investment grade by a credit rating agency deemed suitable for this purpose by SBP;
 - had an internal rating with a PD equivalent to or lower than that associated with an external A- rating at the time the credit protection for an exposure was first provided or for any period of time thereafter; and
 - has an internal rating with a PD equivalent to or lower than that associated with an external investment-grade rating.
 - (c) The underlying obligation is:
 - a corporate exposure as defined in Section 3.1.12. {excluding specialized lending exposures for which the supervisory slotting criteria approach described in Section 3.6.9 (b) and (c). is being used}; or
 - a claim on a PSE that is not a sovereign exposure; or
 - a loan extended to a small business and classified as a retail exposure as defined in Section 3.1.16.

¹⁹ this does not include PSEs and MDBs, even though claims on these may be treated as claims on banks according to Section 3.1.15
²⁰ by non-sovereigns it is meant that credit protection in question does not benefit from any explicit sovereign counter guarantee

- (d) The underlying obligor is not:
 - a financial firm as defined in (b); or
 - a member of the same group as the protection provider.
- (e) The credit protection meets the minimum operational requirements for such Instruments as outlined in Sections 2.6.4 & 6.
- (f) In keeping with Section 2.6.4.2 for guarantees, for any recognition of double default effects for both guarantees and credit derivatives a bank must have the right and expectation to receive payment from the credit protection provider without having to take legal action in order to pursue the counterparty for payment. To the extent possible, a bank should take steps to satisfy itself that the protection provider is willing to pay promptly if a credit event should occur.
- (g) The purchased credit protection absorbs all credit losses incurred on the hedged portion of an exposure that arise due to the credit events outlined in the contract.
- (h) If the payout structure provides for physical settlement, then there must be legal certainty with respect to the deliverability of a loan, bond, or contingent liability. If a 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 would have the ability to purchase it for delivery in accordance with the contract.
- (i) The terms and conditions of credit protection arrangements must be legally confirmed in writing by both the credit protection provider and the bank.
- (j) In the case of protection against dilution risk, the seller of purchased receivables must not be a member of the same group as the protection provider.
- (k) There is no excessive correlation between the creditworthiness of a protection provider and the obligor of the underlying exposure due to their performance being dependent on common factors beyond the systematic risk factor. The bank has a process to detect such excessive correlation. An example of a situation in which such excessive correlation would arise is when a protection provider guarantees the debt of a supplier of goods or services and the supplier derives a high proportion of its income or revenue from the protection provider.

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

For hedged exposures to be treated within the scope of the double default framework, capital requirements may be calculated according to following paragraphs:-

- (a) The capital requirement for a hedged exposure subject to the double default treatment (K_{DD}) is calculated by multiplying K_0 as defined below by a multiplier depending on the PD of the protection provider (PD_g):

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

- (b) K_0 is calculated in the same way as a capital requirement for an unhedged corporate exposure (as defined in Section 3.6.9), but using different parameters for LGD and the maturity adjustment.

$$K_0 = LGD_g \cdot \left[N \left(\frac{G(PD_0) + \sqrt{\rho_{os}} \cdot G(0.999)}{\sqrt{1 - \rho_{os}}} \right) - PD_0 \right] \cdot \frac{1 + (M - 2.5) \cdot b}{1 - 1.5 \cdot b}$$

- (c) PD_o and PD_g are the probabilities of default of the obligor and guarantor, respectively, both subject to the PD floor set out in Section 3.6.5 (a). The correlation ρ_{os} is calculated according to the formula for correlation (R) in Section 3.6.9., with PD being equal to PD_o , and LGD_g is the LGD of a comparable direct exposure to the guarantor (i.e. consistent with para (e) below), the LGD associated with an unhedged facility to the guarantor or the unhedged facility to the obligor, depending upon whether in the event both the guarantor and the obligor 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 obligor, respectively; in estimating either of these LGDs, a bank may recognize collateral posted exclusively against the exposure or credit protection, respectively, in a manner as applicable). There may be no consideration of double recovery in the LGD estimate. The maturity adjustment coefficient ‘b’ is calculated according to the formula for maturity adjustment (b) in Section 3.6.9., with PD being the minimum of PD_o and PD_g . M is the effective maturity of the credit protection, which may under no circumstances be below the one-year floor if the double default framework is to be applied.
- (d) The risk-weighted asset amount is calculated in the same way as for unhedged exposures, i.e.

$$RWA_{DD} = K_{DD} \cdot 12.5 \cdot EAD_g$$

- (e) In no case can the bank 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 favorable 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”.
- (f) 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.

3.7: Credit Risk Mitigation under IRB

3.7.1. General aspects of recognition of credit risk mitigation (CRM)

The legal certainty standards for recognizing CRM as set out under “Standardized Approach” apply for both the Foundation and Advanced IRB Approaches. For instance, collateral considered under the Foundation IRB Approach is treated in the same way as under the comprehensive methodology as in the Standardized Approach, but the range of eligible collateral is increased as it includes receivables, real estate, and other eligible IRB collateral classes. Where such other collateral is taken, an asset-class specific LGD is assigned, depending on degree of collateralization of the exposure concerned. Under AIRB Approach banks are permitted to use their own LGD estimates.

Banks under Foundation IRB Approach, which do not meet the requirements for own estimates of LGD and EAD must meet the minimum requirements described in the Standardized Approach-credit risk mitigation to receive recognition of eligible financial collateral

3.7.2. Financial collateral under the Foundation Approach

The methodology for the recognition of eligible financial collateral closely follows that outlined in the Comprehensive Approach to collateral in the Standardized Approach. The Simple Approach to collateral presented in the Standardized Approach will not be available to banks applying the IRB Approach.

Following the Comprehensive Approach, the effective loss given default (LGD*) applicable to a collateralized transaction can be expressed as follows, where:-

- LGD is that of the senior unsecured exposure before recognition of collateral (45%);
- E is the current value of the exposure (i.e. cash lent or securities lent or posted);

E* is the exposure value after risk mitigation as determined in the Standardized Approach. 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.

$$\text{LGD}^* = \text{LGD} \times (\text{E}^* / \text{E})$$

Banks that qualify for the Foundation IRB Approach may calculate E* using any of the ways specified under the Comprehensive Approach for collateralized transactions under the Standardized Approach.

Where repo-style transactions are subject to a master netting agreement, a bank may choose not to recognize the netting effects in calculating capital. Banks that want to recognize the effect of master netting agreements on such transactions for capital purposes must satisfy the criteria as provided in the Standardized Approach. The bank must calculate E* in accordance with methodology described in the Standardized Approach and equate this to EAD. The impact of collateral on these transactions may not be reflected through an adjustment to LGD. For banks using the Advanced Approach, own LGD estimates would be permitted for the unsecured equivalent amount (E*).

3.7.3. Other Collateral under the Foundation Approach

In addition to the eligible financial collateral recognized in the Standardized Approach, under the Foundation IRB Approach some other forms of collateral, known as eligible IRB collateral, are also recognized. These include receivables, specified commercial and residential real estate (CRE/RRE), and other collateral, where they meet the minimum requirements set out in 3.7.4 to 3.7.7. For eligible financial collateral, the requirements are identical to the operational standards as set out in Section 2.6. The procedure / methodology which the bank should be adopting for collaterals that include receivables, CRE /RRE are described hereinafter.

3.7.4. CRE and RRE as collateral

Eligible CRE and RRE collateral for corporate, sovereign and bank exposures are defined as:-

- Collateral 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.
- 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.

In light of the generic description above and the definition of corporate exposures, income producing real estate that falls under the SL asset class is specifically excluded from recognition as collateral for corporate exposures.

3.7.4.1. Operational requirements for eligible CRE/RRE

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 claims have been fulfilled). Furthermore, the collateral agreement and the legal process underpinning it must be such that they provide for the bank to realize 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 (e.g. reference to house price indices, sampling) 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 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.

Additional collateral management requirements are as follows:

- The types of CRE and RRE collateral accepted by the bank and lending policies (advance rates) 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.

3.7.4.2. Conditions for preferential treatment (CRE /RRE)

In exceptional circumstances for well-developed and long established markets, mortgages on office and/or multi-purpose commercial premises and/or multi-tenanted commercial premises may have the potential to receive an alternative recognition as collateral in the corporate portfolio, subject to SBP approval. A preferential risk weight of 50% for the tranche of the loan that does not exceed the lower of 50% of the market value or 60% of the mortgage lending value of the property securing the loan may be given. Any exposure beyond these limits will receive a 100% risk weight. This exceptional treatment is subject to very strict conditions. In particular, two tests must be fulfilled, namely that (i) losses stemming from commercial real estate lending up to the lower of 50% of the market value or 60% of loan-to value (LTV) based on mortgage-lending-value (MLV) must not exceed 0.3% of the outstanding loans in any given year; and that (ii) overall losses stemming from commercial real estate lending must not exceed 0.5% of the outstanding loans in any given year. This is, if either of these tests is not satisfied in a given year, the eligibility to use this treatment will cease and the original eligibility criteria would need to be satisfied again before it could be applied in the future. When claims benefiting from such an exceptional treatment have fallen past due, they will be risk-weighted at 100%.

The LGD applied to the collateralized portion of such exposures, subject to the limitations set out in Section “credit risk mitigation” of the Standardized Approach, will be set at 35%. The LGD applied to the remaining portion of this exposure will be set at 45%.

Banks which take the benefit of preferential treatment mentioned earlier must document complete details of portfolio which is subject to such preferential treatment meeting all requisite merits, for seeking SBP approval.

3.7.5. Other physical collateral

Banks may recognize other physical collaterals that meet the following standards for credit risk mitigating effect:-

- 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.

For a given bank to receive recognition for additional physical collateral, it must meet all the standards described above for CRE / RRE subject to the following modifications.

- First Claim: With the sole exception of permissible prior claims, only first liens on, or charges over, collateral are permissible. As such, the bank must have priority over all other lenders to the realized proceeds of the collateral. In other words, first liens are subject to the prior right of preferential creditors.
- 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's 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 "fashion-sensitive" collateral to ensure that valuations are appropriately adjusted downward of fashion or model-year, obsolescence as well as physical obsolescence or deterioration.

In cases of inventories (e.g. raw materials, work-in-process, finished goods, dealers' inventories of autos) and equipment, the periodic revaluation process must include physical inspection of the collateral. Banks taking benefit of additional other physical collateral must document that such collateral meets the above conditions, which would be subject to SBP inspection / validation process.

3.7.6. Treatment of pools of collateral

The methodology for determining the effective 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 Standardized Approach and based on the following guidance.

- In the case where a bank has obtained multiple forms of 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 CRE/RRE and other collateral to the Reduced exposure (after recognizing the effect of eligible financial collateral and Receivables collateral) is below the associated threshold level (i.e. the minimum Degree of collateralization of the exposure), the exposure would receive the appropriate unsecured LGD value of 45%.

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

3.7.7. Recognition of financial receivables

(a) Definition of eligible receivables

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 securitizations, sub participations or credit derivatives.

(b) Operational requirements

i) 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 fulfill local requirements in respect of the enforceability of security interest, e.g. by registering a security interest 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 collateralized transactions must be binding on all parties and legally enforceable in all relevant jurisdictions. 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 obligor'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.

ii) 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, analyses 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 collateral to be utilized as a risk mitigants. This process may include, as appropriate and relevant, ageing reports, control of trade documents, borrowing base certificates, frequent audits of collateral, confirmation of accounts, control of the proceeds of accounts paid, analyses of dilution (credits given by the borrower to the issuers) and regular financial analysis of both the borrower and the issuers 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 recognized 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

3.7.8. Effect of Guarantees and Credit Derivatives

3.7.8.1. General Requirements

As a general principle, banks may recognize the guarantors (issuer of guarantee) that are internally rated and associated with a PD equivalent to less than '2' under the Foundation IRB Approach for purpose of determining capital requirements for the dilution risk described in detail earlier. In particular, a guarantee provided by the third party will be treated using the existing IRB rules for guarantees, regardless of whether the guarantee covers default risk, dilution risk, or both.

- If the guarantee covers both the pool's default risk *and* dilution risk, the bank would 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 covers only default risk or dilution risk, but not both, the bank would substitute the risk weight for an exposure to the guarantor in place of the pool's risk weight for the corresponding risk component (default or dilution). The capital requirement for the other component would then be added.
- If a guarantee covers only a portion of the default and/or dilution risk, the uncovered portion of the default and/or dilution risk would be treated as per the existing CRM rules for proportional or tranching coverage (i.e. the risk weights of the uncovered risk components will be added to the risk weights of the covered risk components).

3.7.8.2 Standards for corporate, sovereign, and bank exposures where own estimates of LGD are used and standards for retail exposures:

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.

In all cases, both the borrower and all recognized 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, including the regular monitoring of the guarantor's condition and ability and willingness to honor its obligations. A bank must retain all relevant information on the borrower absent 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.

In no case can the bank 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 favorable 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."

3.7.8.3 Eligible guarantors and guarantees

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 recognize for regulatory capital purposes.

The guarantee must be evidenced in writing, non-cancelable 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 judgment. However, in contrast to the Foundation Approach to corporate, bank, and sovereign exposures, guarantees prescribing conditions under which the guarantor may not be obliged to perform (conditional guarantees) may be recognized under certain conditions. Specifically, the onus is on the bank to demonstrate that the assignment criteria adequately address any potential reduction in the risk mitigation effect.

Eligible guarantees from eligible guarantors will be recognized as follows:-

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

3.7.8.4. Treatment of guarantees and Credit Derivatives

There are two approaches for recognition of CRM in the form of guarantees in the IRB Approach: a Foundation Approach for banks using supervisory values of LGD, and an Advanced Approach for those banks using their own internal estimates of LGD.

Either under Foundation or Advanced IRB, Credit Risk Mitigation (CRM) in the form of guarantees and credit derivatives must not reflect the effect of double default (see Section 3.7.8.2 (last para)). As such, to the extent that the CRM is recognized by the

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

a) Recognition under the Foundation Approach:-

For banks using the Foundation Approach for LGD, the approach to guarantees closely follows the treatment under the Standardized Approach. The range of eligible guarantors is the same as under the Standardized Approach except that companies that are internally rated and associated with a PD equivalent to that of a company rated '2' or better may also be recognized under the Foundation Approach.

The uncovered portion of the exposure is assigned the risk weight associated with the underlying obligor. Where partial coverage exists, or where there is a currency mismatch between the underlying obligation and the credit protection, it is necessary to split the exposure into a covered and an uncovered amount. The treatment in the Foundation Approach follows that outlined in the Standardized Approach and depends upon whether the cover is proportional or tranching.

b) Recognition under the Advanced Approach:-

Banks using the Advanced Approach for estimating LGDs may reflect the risk mitigating effect of guarantees and credit derivatives through either adjusting PD or LGD estimates. Whether adjustments are done through PD or LGD, they must be done in a consistent manner for a given guarantee or credit derivative type. In doing so, banks must not include the effect of double default in such adjustments. Thus, the adjusted risk weight must not be less than that of a comparable direct exposure to the protection provider.

A bank relying on own-estimates of LGD has the option to adopt the treatment of guarantees outlined above for banks under the Foundation IRB Approach as in (a) above or to make an adjustment to its LGD estimate of the exposure to reflect the presence of the guarantee or credit derivative. Under this option, there are no limits to the range of eligible guarantors although the set of minimum requirements concerning the type of guarantee must be satisfied as mentioned in Section 3.7.8.3. For credit derivatives, the following requirements must be satisfied:-

- (i) 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 are met.
- (ii) 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.

3.7.8.5 Adjustment criteria

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 described under the title “Minimum Requirement for IRB.”

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.

In adjusting borrower grades or LGD estimates (or in the case of retail and eligible purchased receivables, the process of allocating exposures to pools), banks must take all relevant available information into account.

3.7.9. Requirements for recognition of leasing

Leases other than those that expose the bank to residual value risk should be accorded the same treatment as exposures collateralized 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 amortization of the lease payments must not be so large as to overstate the CRM attributed to the leased assets.

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

- The discounted lease payment stream will receive a risk weight appropriate for the lessee’s financial strength (PD) and supervisory or own-estimate of LGD, which ever is appropriate.
- The residual value will be risk-weighted at 100%

Summary

Collateral Eligible under IRB Approaches

1. Foundation IRB Approach

i. Financial Collaterals:-

- Cash
- Gold
- Debt securities with, at least, a '4' rating (for sovereign and PSEs), a '3' rating (for other issuers) or 'S3' (for short-term debt securities)
- Unrated debt securities if they are (i) issued by banks, (ii) listed and (iii) senior
- Equities (including convertible bonds, if any) included in a main index
- Mutual funds if (i) they are quoted daily and (ii) the underlying are only instruments listed above
- Equities (including convertible bond, if any) which are not included in a main index but which are listed on recognized exchange.
- Undertakings for collective investments in Transferable Securities (UCITS) / mutual funds which include such equities.

ii. Physical Collateral:-

- Residential (RRE) and Commercial Real Estate (CRE) => 35% LGD
- Receivables => 35% LGD
- Other collateral meeting the same requirements as for CRE and RRE => 40% LGD

2. Advanced IRB Approach

- i. Financial Collaterals:- No limit
- ii. Physical Collateral:- No limit for the recognition of physical collateral provided that management standards are fulfilled (except a 10% floor for LGDs for residential mortgage)

Appendix-3.1
Supervisory Slotting Criteria for Specialized Lending
Table – 1 Supervisory Rating Grades for Project Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
1. 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.
2. 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
3. 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 object 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				
4. Duration of the credit compared to the duration of the project	Useful life of the project significantly exceeds tenor of the loan	Useful life of the project exceeds tenor of the loan.	Useful life of the project exceeds tenor of the loan.	Useful life of the project may not exceed tenor of the loan
5. Amortization schedule	Amortizing debt	Amortizing debt	Amortizing debt repayments with limited bullet payment	Bullet repayment or amortizing debt repayments with high bullet repayment.

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
Political and legal environment				
1. 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.
2. Force majeure risk (war, civil unrest, etc.)	Low exposure	Acceptable exposure	Standard protection	Significant risk, not fully mitigated
3. 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
4. Stability of legal and regulatory environment (risk of change in law)	Favorable and stable regulatory environment over the long term	Favorable 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
5. Acquisition of all necessary supports and approvals for such relief from local content laws	Strong	Satisfactory	Fair	Weak
6. Enforceability of contracts, collateral and security	Contracts, collateral and security are enforceable	Contracts, collateral and security are enforceable	Contracts, collateral and security are considered enforceable even if certain non-key issues may exist	There are unresolved key issues in respect if actual enforcement of contracts, collateral and security
Transaction characteristics				
1. Design and technology risk	Fully proven technology and design	Fully proven technology and design	Proven technology and design start-up issues are mitigated by a strong completion package	Unproven technology and design; technology issues exist and/or complex design

	Strong	Good	Satisfactory	Weak
2. Construction risk				
a) Permitting and sitting	All permits have been obtained	Some permits are still outstanding but their receipt is considered very likely	Some permits are still outstanding but the permitting process is well defined and they are considered routine	Key permits still need to be obtained and are not considered routine. Significant conditions may be attached
b) Type of construction contract	Fixed-price date-certain turnkey construction EPC (engineering and procurement contract)	Fixed-price date-certain turnkey construction EPC	Fixed-price date-certain turnkey construction contract with one or several contractors	No or partial fixed-price turnkey contract and/or interfacing issues with multiple contractors
3. 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
4. Track record and financial strength of contractor in constructing similar projects.	Strong	Good	Satisfactory	Weak
5. Operating risk				
a) 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
b) Operator's expertise, track record, and financial strength	Very strong, or committed technical assistance of the sponsors	Strong	Acceptable	Limited/weak, or local operator dependent on local authorities

	Strong	Good	Satisfactory	Weak
<p>6. Off-take risk</p> <p>(a) If there is a take-or-pay or fixed-price off-take contract:</p> <p>(b) If there is no take-or-pay or fixed-price off-take contract:</p>	<p>Excellent Creditworthiness of off-taker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt</p> <p>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</p>	<p>Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt</p> <p>Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates</p>	<p>Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt</p> <p>Commodity is sold on a limited market that may absorb it only at lower than projected prices</p>	<p>Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt</p> <p>Project output is demanded by only one or a few buyers or is not generally sold on an organized market</p>
<p>7. Supply risk</p> <p>a) Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength</p> <p>b) Reserve risks (e.g. natural resource development)</p>	<p>Long-term supply contract with supplier of excellent financial standing</p> <p>Independently audited; proven and developed reserves well in excess of requirements over lifetime of the project</p>	<p>Long-term supply contract with supplier of good financial standing</p> <p>Independently audited, proven and developed reserves in excess of requirements over lifetime of the project</p>	<p>Long-term supply contract with supplier of good financial standing – a degree of price risk may remain</p> <p>Proven reserves can supply the project adequately through the maturity of the debt</p>	<p>Short-term supply contract or long-term supply contract with financially weak supplier – a degree of price risk definitely remains</p> <p>Project relies to some extent on potential and undeveloped reserves.</p>
Strength of Sponsor				
1. Sponsor's track record, financial strength, and country/sector experience	Strong sponsor with excellent track record and high financial standing	Good sponsor with satisfactory track record and good financial standing	Adequate sponsor with adequate track record and good financial standing	Weak sponsor with no or questionable track record and/or financial weaknesses

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
2. Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if necessary	Strong. Project is highly strategic for the sponsor (core business – long – term strategy)	Good. Project is strategic for the sponsor (core business – long-term strategy)	Acceptable. Project is considered important for the sponsor (core business)	Limited. Project is not key to sponsor's long term strategy or core business
Security Package				
1. Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
2. Pledge of assets, taking into account quality, value and liquidity of assets	First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project	Little security or collateral for lenders; weak negative pledge clause
3. Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts)	Strong	Satisfactory	Fair	Weak
4. 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
5. Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc.)	Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank	Average coverage period, all reserve funds fully funded	Average coverage period, all reserve funds fully funded	Shorter than average coverage period, reserve funds funded from operating cash flows

Table – 2
Supervisory Rating Grades for Income-Producing Real Estate Exposures and High-Volatility Commercial Real Estate Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
1. 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 favorable compared to those expiring
2. 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
3. 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.

Instructions on Minimum Capital Requirements for Banks/DFIs

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

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
2. Design and condition	Property is favored 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
3. 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				
1. Financial capacity and willingness to support the property	The sponsor/developer made 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 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.
2. Reputation and track record with similar properties	Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties	Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties	Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns	Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past.

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
3. 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				
1. Nature of lien	Perfected first lien ²¹	Perfected first lien	Perfected first lien	Ability of lender to foreclose is constrained
2. Assignment of rents (for projects leased to long-term tenants)	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to remit rents directly to the lender, such as a current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender, such as current rent roll and copies of the project's leases	The lender has obtained an assignment. They maintain current tenant information that would facilitate providing notice to the tenants to remit rents directly to the lender such as current rent roll and copies of the project's leases	The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants
3. Quality of the insurance coverage	Appropriate	Appropriate	Appropriate	Substandard

²¹ Lenders in some markets extensively use loan structures that include junior liens. Junior liens may be indicative of this level of risk if the total LTV inclusive of all senior positions does not exceed a typical first loan LTV.

Table-3
Supervisory Rating Grades for Object Finance Exposure

	Strong	Good	Satisfactory	Weak
Financial strength				
1. 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
2. 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
3. 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
4. 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				
1. 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
2. Legal and regulatory risks	Jurisdiction is favorable to repossession and enforcement of contracts	Jurisdiction is favorable to repossession and enforcement of contracts	Jurisdiction is generally favorable to repossession and enforcement of contracts even if re-possession might be long and/or difficult	Poor or unstable legal and regulatory environment. Jurisdiction may make repossession and enforcement of contracts lengthy or impossible

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
Transaction characteristics				
1. 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				
1. 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
2. Scope and nature of O & M contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts (if needed)	Long-term O&M contract, and/or O&M reserve accounts (if needed)	Limited O&M contract or O&M reserve account (if needed)	No O&M contract: risk of high operational cost overruns beyond mitigants
3. Operator's financial strength, track record in managing the asset type and capability to re-market asset	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				
1. 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, may be 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
2. 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
3. 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

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
Strength of sponsor				
1. Operator's financial strength, track record in managing the asset type and capability to re-market asset when it comes off lease	Excellent track record and strong re-marketing capability	Satisfactory track record and re-marketing capability	Weak or short track record and uncertain re-marketing capability	No or unknown track record and inability to re-market the asset
2. 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				
1. Asset control	Legal documentation provides the lender effective control (e.g. a first perfected security interest, or a leasing structure including such security) on the asset, or on the company owing it	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owing it	Legal documentation provides the lender effective control o (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owing it	The contract provides little security to the lender and leaves room to some risk of losing control on the asset
2. 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
3. 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 Commodities Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
1. Degree of over-collateralization of trade	Strong	Good	Satisfactory	Weak
Political and legal environment				
1. 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)
2. Mitigation of country risks	Very strong mitigation:	Strong mitigation:	Acceptable mitigation	Only partial mitigation:
	Strong offshore mechanisms	Offshore mechanisms	Offshore mechanisms	No offshore mechanisms
	Strategic commodity	Strategic commodity	Less strategic commodity	Non-strategic commodity
	1 st class buyer	Strong buyer	Acceptable buyer	Weak buyer
Asset characteristics				
1. Liquidity and susceptibility	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				
1. Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak
2. 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
3. Trading controls and hedging policies	Strong standards for counter party selection, hedging, and monitoring	Adequate standards for counter party selection, hedging, and monitoring	Past deals have experienced no or minor problems	Trader has experienced significant losses on past deals

Instructions on Minimum Capital Requirements for Banks/DFIs

	Strong	Good	Satisfactory	Weak
4. Quality of financial disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
Security Package				
1. 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 jeopardized
2. 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-3.2

Specific Requirements for Internal Models market-based approach for Equity Exposures

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. A bank that fails to demonstrate continued compliance with the minimum requirements must develop a plan for rapid return to compliance, obtain its SBP'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.

Capital charge and risk quantification

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

- (a) The capital charge is equivalent to the potential loss on the bank'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.
- (b) The estimated losses should be robust to adverse market movements relevant to the long-term risk profile of the bank'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 SBP 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, 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.
- (c) 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 bank'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.
- (d) Banks may also use modeling 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 SBP that the methodology and its output can be quantified in the form of the loss percentile specified under (a).

Appendix 3.2 Cont'd

- (e) 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.
- (f) Subject to supervisory review, equity portfolio correlations can be integrated into a bank's internal risk measures. The use of explicit correlations (e.g. utilization 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 SBP in its review of model documentation and estimation techniques.
- (g) 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 judgment is combined with quantitative techniques in estimating a holding's return volatility, the judgment must take into account the relevant and material information not considered by the other techniques utilized.
- (h) Where factor models are used, either single or multi-factor models are acceptable depending upon the nature of a bank'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 capitalization 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.
- (i) Estimates of the return volatility of equity investments must incorporate relevant and material available data, information, and methods. A bank may utilize 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.
- (j) A rigorous and comprehensive stress-testing program 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

Banks overall risk management practices used to manage their banking book equity investments are expected to be consistent with the evolving sound practice guidelines. 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 modeling 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 SRP. The banks should be able to

Appendix 3.2 Cont'd

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 modeling 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 program, 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. The units responsible for the design and application of the model must be functionally independent from the units responsible for managing individual 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 modeling process must be adequately qualified. Management must allocate sufficient skilled and competent resources to the modeling function.

Validation and documentation

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 modeling process. The modeling 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 SBP.

Validation.

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

Banks must regularly compare actual return performance (computed using realized and unrealized gains and losses) with modeled 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. 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. Bank's 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.

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.

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

Appendix 3.2 Cont'd

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.

To facilitate model validation through back testing 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 back test the volatility estimates used within their internal models and the appropriateness of the proxies used in the model. Banks need 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

All critical elements of an internal model and the modeling process should be fully and adequately documented. Banks must document in writing their internal model's design and operational details. The documentation should demonstrate bank's 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, and responsibilities of parties involved in the modeling, 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 modeling methodology and must be able to provide analyses demonstrating that the model and modeling 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 modeling 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.
- (c) 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 sub-sector, 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.

Chapter 4

Credit Risk-Securitization

Banks must apply the securitization guidelines set out hereinafter for determining regulatory capital requirements on exposures arising from traditional and synthetic securitizations or similar structures that contain features common to both. Since securitizations may be structured in many different ways, the capital treatment of a securitization exposure must be determined on the basis of its economic substance rather than its legal form. SBP would be assessing the economic substance of a transaction to determine whether it should be subject to the securitization framework for purposes of determining regulatory capital. Banks are encouraged to consult SBP when there is uncertainty about whether a given transaction should be considered a securitization exposure. For example, transactions involving cash flows from real estate (e.g. rents) may be considered specialized lending exposures, if warranted.

Banks' exposures to a securitization are hereafter referred to as "securitization exposures". Securitization exposures can include but are not restricted to: asset-backed securities, mortgage-backed securities, credit enhancements, liquidity facilities, interest rate or currency swaps, credit derivatives and tranching cover. Tranching cover means, where the bank transfers a portion of the risk of an exposure in one or more tranches to a protection seller or sellers and retains some level of risk of the loan and the risk transferred and the risk retained are of different seniority, banks may obtain credit protection for either the senior tranches (e.g. second loss portion) or the junior tranche (e.g. first loss portion). Reserve accounts, such as cash collateral accounts, recorded as an asset by the originating bank must also be treated as securitization exposures

Underlying instruments in the pool being securitized may include but are not restricted to the: loans, commitments, asset-backed and mortgage-backed securities, corporate bonds, equity securities, and private equity investments. The underlying pool may include one or more exposures.

The concepts and terminologies discussed hereinafter are for illustrative purposes only. The banks should continue to follow the instructions / guidelines issued by SBP from time to time on the subject (securitization).

4.1 Definitions and general terminology

4.1.1 Special purpose vehicle / entity (SPV)

An SPV is a corporation, trust, or other entity organized for a specific purpose, the activities of which are limited to those appropriate to accomplish the purpose of the SPV, and the structure of which is intended to isolate the SPV from the credit risk of an originator or seller of exposures. SPVs are commonly used as financing vehicles in which exposures are sold to a trust or similar entity in exchange for cash or other assets funded by debt issued by the trust. In this regard banks shall refer to SBP's instructions issued from time to time.

4.1.2 Traditional securitization

A *traditional securitization* is a structure where the cash flow from an underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk. Payments to the investors depend upon the performance of the specified underlying exposures, as opposed to being derived from an *obligation of the entity originating those exposures*. The stratified/tranched structures that characterize securitizations differ from ordinary senior/subordinated debt instruments in that junior securitization tranches can absorb losses without interrupting contractual payments to more senior tranches, whereas subordination in a senior/subordinated debt structure is a matter of priority of rights to the proceeds of liquidation.

4.1.3 Synthetic securitization

A *synthetic securitization* is a structure with at least two different stratified risk positions or tranches that reflect different degrees of credit risk where credit risk of an underlying pool of exposures is transferred, in whole or in part, through the use of funded (e.g. credit-linked notes) or unfunded (e.g. credit default swaps) credit derivatives or guarantees that serve to hedge the credit risk of the portfolio. Accordingly, the investors' potential risk is dependent upon the performance of the underlying pool.

4.1.4 Originating bank

For risk-based capital purposes, a bank is considered to be an originator with regard to a certain securitization if it meets either of the following conditions:-

1. The bank originates directly or indirectly underlying exposures included in the securitization; or
2. The bank serves as a sponsor of an asset-backed commercial paper (ABCP) conduit or similar program that acquires exposures from third-party entities. In the context of such programs, a bank would generally be considered a sponsor and, in turn, an originator if it, in fact or in substance, manages or advises the program, places securities into the market, or provides liquidity and/or credit enhancements.

4.1.5 Asset-backed commercial paper (ABCP) program

An asset-backed commercial paper (ABCP) program predominately issues commercial paper with an original maturity of one year or less that is backed by assets or other exposures held in a bankruptcy-remote, special purpose entity.

4.1.6 Clean-up call

A clean-up call is an option that permits the securitization exposures (e.g. asset-backed securities) to be called before all of the underlying exposures or securitization exposures have been repaid. In the case of traditional securitizations, this is generally accomplished by repurchasing the remaining securitization exposures once the pool balance or outstanding securities have fallen below some specified level. In the case of a synthetic transaction, the clean-up call may take the form of a clause that extinguishes the credit protection.

4.1.7 Credit enhancement

A credit enhancement is a contractual arrangement in which the bank retains or assumes a securitization exposure and, in substance, provides some degree of added protection to other parties to the transaction.

4.1.8 Credit-enhancing interest-only strip

A credit-enhancing interest-only strip (*I/O*) is an on-balance sheet asset that:-

- i) represents a valuation of cash flows related to future margin income, and
- ii) is subordinated.

4.1.9 Early amortization

Early amortization provisions are mechanisms that, once triggered, allow investors to be paid out prior to the originally stated maturity of the securities issued. For risk-based capital purposes, an early amortization provision will be considered either controlled or non-controlled. A controlled early amortization provision must meet all of the following conditions:-

- a) The bank must have an appropriate capital/liquidity plan in place to ensure that it has sufficient capital and liquidity available in the event of an early amortization.
- b) Throughout the duration of the transaction, including the amortization period, there is the same pro rata sharing of interest, principal, expenses, losses and recoveries based on the bank's and investors' relative shares of the receivables outstanding at the beginning of each month.
- c) The bank must set a period for amortization that would be sufficient for at least 90% of the total debt outstanding at the beginning of the early amortization period to have been repaid or recognized as in default; and
- d) The pace of repayment should not be any more rapid than would be allowed by straight-line amortization over the period set out in criterion (c).

An early amortization provision that does not satisfy the conditions for a controlled early amortization provision will be treated as a non-controlled early amortization provision.

4.1.10 Excess spread

Excess spread is generally defined as gross finance charge collections and other Income received by the trust or special purpose entity minus certificate interest, servicing fees, charge-offs, and other senior trust or SPV expenses.

4.1.11 Implicit support

Implicit support arises when a bank provides support to a securitization in excess of its predetermined contractual obligation.

4.2 Operational Requirements

4.2.1 Traditional Securitization

An originating bank may exclude securitized exposures from the calculation of risk-weighted assets only if all of the following conditions have been met. Banks meeting these conditions must still hold regulatory capital against any securitization exposures they retain.

- a) Significant credit risk associated with the securitized exposures has been transferred to third parties.
- b) The transferor does not maintain effective or indirect control over the transferred exposures. The assets are legally isolated from the transferor in such a way (e.g. through the sale of assets or through sub-participation) that the exposures are put beyond the reach of the transferor and its creditors, even in bankruptcy or receivership. These conditions must be supported by an opinion provided by a qualified legal counsel.

The transferor is deemed to have maintained effective control over the transferred credit risk exposures if it: (i) is able to repurchase from the transferee the previously transferred exposures in order to realize their benefits; or (ii) is obligated to retain the risk of the transferred exposures. The transferor's retention of servicing rights to the exposures will not necessarily constitute indirect control of the exposures.

- c) The securities issued are not obligations of the transferor. Thus, investors who purchase the securities only have claim to the underlying pool of exposures.
- d) The transferee is an SPV and the holders of the beneficial interests in that entity have the right to pledge or exchange them without restriction.
- e) Clean-up calls must satisfy the respective conditions described hereinafter.
- f) The securitization does not contain clauses that :-
 - i) require the originating bank to alter systematically the underlying exposures such that the pool's weighted average credit quality is improved unless this is achieved by selling assets to independent and unaffiliated third parties at market prices;
 - ii) allow for increases in a retained first loss position or credit enhancement provided by the originating bank after the transaction's inception; or
 - iii) increase the yield payable to parties other than the originating bank, such as investors and third-party providers of credit enhancements, in response to deterioration in the credit quality of the underlying pool.

4.2.2 Synthetic Securitization

For synthetic securitizations, the use of CRM techniques (i.e. collateral, guarantees and credit derivatives) for hedging the underlying exposure may be recognized for risk-based capital purposes only if the conditions outlined below are satisfied: -

- (a) Credit risk mitigants must comply with the requirements as discussed under CRM in The Standardized Approach (Section 2.6).
- (b) Eligible collateral is limited to that specified in Section 2.6.2.2. Eligible collateral pledged by SPVs may be recognized.
- (c) Eligible guarantors are defined in Section 2.6.4.3. Banks may not recognize SPVs as eligible guarantors in the securitization framework.
- (d) Banks must transfer significant credit risk associated with the underlying exposure to third parties.
- (e) The instruments used to transfer credit risk may not contain terms or conditions that limit the amount of credit risk transferred, such as those provided below:
 - Clauses that materially limit the credit protection or credit risk transference (e.g. significant materiality thresholds below which credit protection is deemed not to be triggered even if a credit event occurs or those that allow for the termination of

- the protection due to deterioration in the credit quality of the underlying exposures);
- Clauses that require the originating bank to alter the underlying exposures to improve the pool's weighted average credit quality;
 - Clauses that increase the banks' cost of credit protection in response to deterioration in the pool's quality;
 - Clauses that increase the yield payable to parties other than the originating bank, such as investors and third-party providers of credit enhancements, in response to a deterioration in the credit quality of the reference pool; and
 - Clauses that provide for increases in a retained first loss position or credit enhancement provided by the originating bank after the transaction's inception.
- (f) An opinion must be obtained from a qualified legal counsel that confirms the enforceability of the contracts in all relevant jurisdictions.
- (g) Clean-up calls must satisfy the respective operational conditions described under the respective section.

For synthetic securitizations, the effect of applying CRM techniques for hedging the underlying exposure shall be treated according to Section 2.6. When the exposures in the underlying pool have different maturities, the longest maturity must be taken as the maturity of the pool. Maturity mismatches may arise in the context of synthetic securitizations when, for example, a bank uses credit derivatives to transfer part or all of the credit risk of a specific pool of assets to third parties. When the credit derivatives unwind, the transaction will terminate. This implies that the effective maturity of the tranches of the synthetic securitization may differ from that of the underlying exposures. Originating banks of synthetic securitizations must treat such maturity mismatches in the following manner. A bank using the Standardized Approach for securitization must deduct all retained positions that are unrated or rated below investment grade. Accordingly, when deduction is required, maturity mismatches are not taken into account. For all other securitization exposures, the bank must apply the maturity mismatch treatment set forth in 2.6.3.2(a)(i) and (ii). This criterion / treatment should also be applied, if a synthetic securitization incorporates a call (other than a cleanup call) that effectively terminates the transaction and the purchased credit protection on a specific date.

4.2.3 Treatment of Clean-up Calls

- (a) For securitization transactions that include a clean-up call, no capital will be required due to the presence of a clean-up call if the following conditions are met:-
- i) the exercise of the clean-up call must not be mandatory, in form or in substance, but rather must be at the discretion of the originating bank;
 - ii) the clean-up call must not be structured to avoid allocating losses to credit enhancements or positions held by investors or otherwise structured to provide credit enhancement; and
 - iii) the clean-up call must only be exercisable when 10% or less of the original underlying portfolio, or securities issued remain, or, for synthetic securitizations, when 10% or less of the original reference portfolio value remains.

- (b) Securitization transactions that include a clean-up call that does not meet all of the criteria stated above result in a capital requirement for the originating bank. For a traditional securitization, the underlying exposures must be treated as if they were not securitized. Additionally, banks must not recognize in regulatory capital any gain-on-sale, as defined in Section 4.3.1.1 (b). For synthetic securitizations, the bank purchasing protection must hold capital against the entire amount of the securitized exposures as if they did not benefit from any credit protection. If a clean-up call, when exercised, is found to serve as a credit enhancement, the exercise of the clean-up call must be considered a form of implicit support provided by the bank and must be treated in accordance with the supervisory guidance pertaining to Securitization transactions.

4.3 Treatment of Securitization Exposures

4.3.1 Calculation of Capital Requirement against Securitization Exposures

Banks are required to hold regulatory capital against all of their securitization exposures, including those arising from the provision of credit risk mitigants to a securitization transaction, investments in asset-backed securities, retention of a subordinated tranche, and extension of a liquidity facility or credit enhancement, as set forth in the following sections. Repurchased securitization exposures must be treated as retained securitization exposures.

4.3.1.1 Deduction(s)

- (a) When a bank is required to deduct a securitization exposure from regulatory capital, the deduction must be taken 50% from Tier 1 and 50% from Tier 2 with the one exception noted in paragraph (b) below. Credit enhancing I/Os (net of the amount that must be deducted from Tier 1 as in paragraph (b) below are deducted 50% from Tier 1 and 50% from Tier 2. Deductions from capital may be calculated net of any specific provisions taken against the relevant securitization exposures.
- (b) Banks must deduct from Tier 1 any increase in equity capital resulting from a securitization transaction, such as that associated with expected future margin income (FMI) resulting in a gain-on-sale that is recognized in regulatory capital. Such an increase in capital is referred to as a “gain-on-sale” for the purposes of the securitization framework.
- (c) For the purposes of the EL-provision calculation as set out in Section 3.6.13, securitization exposures do not contribute to the EL amount. Similarly, any specific provisions against securitization exposures are not to be included in the measurement of eligible provisions.

4.3.1.2 Implicit support

When a bank provides implicit support to a securitization, it must, at a minimum, hold capital against all of the exposures associated with the securitization transaction as if they had not been securitized. Additionally, banks would not be permitted to recognize in regulatory capital any gain-on-sale, as defined in paragraph (b) above. Furthermore, the bank is required to disclose publicly that (i) it has provided non-contractual support and (ii) the capital impact of doing so.

4.4 Operational requirements for use of external credit assessments

The following operational criteria concerning the use of external credit assessments apply for the securitization framework:

- (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 recognized by SBP for the purpose. In this regard an eligible credit assessment must be publicly available. In other words, a 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 securitizations, 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 securitization 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 securitization 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, the criterion set out for "multiple assessments" in Section 2.3.4 will apply.
- (e) Where CRM is provided directly to an SPV by an eligible guarantor defined in Section 2.6.4.3 and is reflected in the external credit assessment assigned to a securitization 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 recognized as an eligible guarantor in as in the said section, the covered securitization exposures should be treated as unrated.
- (f) In the situation where a credit risk mitigant is not obtained by the SPV but rather applied to a specific securitization exposure within a given structure (e.g. ABS tranche), the bank must treat the exposure as if it is unrated and then use the credit risk mitigation (CRM) treatment outlined for under Standardized Approach or in the Foundation IRB Approach, to recognize the hedge.

4.5 Standardized Approach for securitization exposures

4.5.1 Scope

Banks that apply the Standardized Approach to credit risk for the type of underlying exposure(s) securitized must use the Standardized Approach under the securitization framework.

4.5.2 Risk weights

The risk-weighted asset amount of a securitization exposure is computed by multiplying the amount of the position by the appropriate risk weight determined in accordance with

the following tables. For off-balance sheet exposures, banks must apply a credit conversion factor (CCF) and then risk weight the resultant credit equivalent amount. If such an exposure is rated, a CCF of 100% must be applied. For positions with long-term ratings of '5' and short-term ratings of 'S4', deduction from capital as mentioned in Section 4.3.1.1(a) is required. Deduction is also required for unrated positions with the exception of the circumstances described in Section 4.5.3 to 4.5.5.

Table 4.1(a)
Long-term rating category

External Credit Assessment	1	2	3	4	5 or unrated
Risk Weight	20%	50%	100%	350%	Deduction

Table 4.1(b)
Short-term rating category

External Credit Assessment	S1	S2	S3	S4 or unrated
Risk Weight	20%	50%	100%	Deductions

For the risk weights mentioned above the following conditions are applicable;

- (a) *Investors may recognize ratings on below-investment grade exposures:-* Only third-party investors, as opposed to banks that serve as originators, may recognize external credit assessments that are equivalent to '4' for risk weighting purposes of securitization exposures.
- (b) *Originators to deduct below-investment grade exposures:-* Originating banks as defined in Section 4.1.4 must deduct all retained Securitization exposures rated below investment grade (i.e. '3').

4.5.3 Exceptions to general treatment of unrated securitization exposures

As noted in the tables 4.1 above, unrated securitization exposures must be deducted with the following exceptions: (i) the most senior exposure in a securitization (Section 4.5.4), (ii) exposures that are in a second loss position or better in ABCP programs and meet the requirements outlined in Section 4.5.5, and (iii) eligible liquidity facilities (Section 4.5.6.2)

4.5.4 Treatment of unrated most senior securitization exposures

- (a) If the most senior exposure in a securitization of a traditional or synthetic securitization is unrated, a bank that holds or guarantees such an exposure may determine the risk weight by applying the "look-through" treatment, provided the composition of the underlying pool is known at all times. Banks are not required to consider interest rate or currency swaps when determining whether an exposure is the most senior in a securitization for the purpose of applying the "look-through" approach.
- (b) In the look-through treatment, the unrated most senior position receives the average risk weight of the underlying exposures subject to supervisory review. Where the

bank is unable to determine the risk weights assigned to the underlying credit risk exposures, the unrated position must be deducted.

4.5.5 Treatment of exposures in a second loss position or better in ABCP programs

- (a) Deduction is not required for those unrated securitization exposures provided by sponsoring banks to ABCP programs that satisfy the following requirements:-
 - i) The exposure is economically in a second loss position or better and the first loss position provides significant credit protection to the second loss position;
 - ii) The associated credit risk is the equivalent of investment grade or better; and
 - iii) The bank holding the unrated securitization exposure does not retain or provide the first loss position.
- (b) Where these conditions are satisfied, the risk weight is greater of (i) 100% or (ii) the highest risk weight assigned to any of the underlying individual exposures covered by the facility.

4.5.6 Risk weights for eligible liquidity facilities

For eligible liquidity facilities as defined in Section 4.5.6.2 and where the conditions for use of external credit assessments in Section 4.4 are not met, the risk weight applied to the exposure's credit equivalent amount is equal to the highest risk weight assigned to any of the underlying individual exposures covered by the facility.

4.5.6.1 Credit conversion factors for off-balance sheet exposures

For risk-based capital purposes, banks must determine whether, according to the criteria outlined below, an off-balance sheet securitization exposure qualifies as an 'eligible liquidity facility' or an 'eligible servicer cash advance facility'. All other off-balance sheet securitization exposures will receive a 100% CCF.

4.5.6.2 Eligible liquidity facilities

Banks are permitted to treat off-balance sheet securitization exposures as eligible liquidity facilities if the following minimum requirements are satisfied. In this regard, where following conditions are met, the bank may apply a 20% CCF to the amount of eligible liquidity facilities with an original maturity of one year or less, or a 50% CCF if the facility has an original maturity of more than one year. However, if an external rating of the facility itself is used for risk-weighting the facility, a 100% CCF must be applied.

- (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 as defined in Section 3.1.1. 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 (e.g. transaction-specific and program-wide) 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 in the program (e.g. ABCP program) or subject to deferral or waiver.

4.5.6.3 Eligible liquidity facilities available only in the event of market disruption

Banks may apply a 0% CCF to eligible liquidity facilities that are only available in the event of a general market disruption (i.e. whereupon more than one SPV across different transactions are unable to roll over maturing commercial paper, and that inability is not the result of an impairment in the SPVs' credit quality or in the credit quality of the underlying exposures). To qualify for this treatment, the conditions provided in Section 4.5.6.2 must be satisfied. Additionally, the funds advanced by the bank to pay holders of the capital market instruments (e.g. commercial paper) when there is a general market disruption must be secured by the underlying assets, and must rank at least *pari passu* with the claims of holders of the capital market instruments.

4.5.6.4 Treatment of overlapping exposures

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.

4.5.6.5 Eligible servicer cash advance facilities

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 cancelable without prior notice are eligible for a 0% CCF.

4.5.7 Treatment of credit risk mitigation for securitization exposures

Credit risk mitigants on securitization exposures include guarantees, credit derivatives, and collateral. Collateral in this context refers to that used to hedge the credit risk of a securitization exposure rather than the underlying exposures of the securitization transaction. When a bank other than the originator provides credit protection to a securitization exposure, it must calculate a capital requirement on the covered exposure as if it were an investor in that securitization. If a bank provides protection to an unrated

credit enhancement, it must treat the credit protection provided as if it were directly holding the unrated credit enhancement.

4.5.7.1 Collateral, Guarantees and credit derivatives

- (a) Eligible collateral is limited to that recognized and described under CRM in Standardized Approach. Collateral pledged by SPVs are also recognized. Credit protection provided by the entities mentioned in Section 2.6.4.3 are recognized for securitization purposes. SPVs are not eligible as guarantors.
- (b) Where guarantees or credit derivatives fulfill the minimum operational conditions as specified in Sections 2.6.4 & 6, banks can take account of such credit protection in calculating capital requirements for securitization exposures.
- (c) Capital requirements for the guaranteed/protected portion will be calculated according to CRM for the Standardized Approach as specified in Section 2.6.4.3 to 2.6.4.8.

4.5.7.2 Maturity mismatches

For the purpose of setting regulatory capital against a maturity mismatch, the capital requirement will be determined in accordance with Sections 2.6.3.6 & 7. When the exposures being hedged have different maturities, the longest maturity must be used.

4.5.8 Capital requirement for early amortization provisions

4.5.8.1 Scope

- (a) An originating bank is required to hold capital against all or a portion of the investors' interest (i.e. against both the drawn and undrawn balances related to the securitized exposures) when:-
 - (i) It sells exposures into a structure that contains an early amortization feature; and
 - (ii) The exposures sold are of a revolving nature. These involve exposures where the borrower is permitted to vary the drawn amount and repayments within an agreed limit under a line of credit (e.g. credit card receivables and corporate loan commitments).
- (b) For securitization structures wherein the underlying pool comprises revolving and term exposures, a bank must apply the relevant early amortization treatment (outlined in Section 4.5.8.2; 4.5.8.3 and 4.5.9) to that portion of the underlying pool containing revolving exposures.
- (c) The capital requirement should reflect the type of mechanism through which an early amortization is triggered. Banks are not required to calculate a capital requirement for early amortizations in the following situations:-
 - i) Replenishment structures where the underlying exposures do not revolve and the early amortization ends the ability of the bank to add new exposures;
 - ii) Transactions of revolving assets containing early amortization features that mimic term structures (i.e. where the risk on the underlying facilities does not return to the originating bank);
 - iii) Structures where a bank securities one or more credit line(s) and where investors remain fully exposed to future draws by borrowers even after an early amortization event has occurred;

- iv) The early amortization clause is solely triggered by events not related to the performance of the securitized assets or the selling bank, such as material changes in tax laws or regulations.

4.5.8.2 Maximum capital requirement

For a bank subject to the early amortization treatment, the total capital charge for all of its positions will be subject to a maximum capital requirement (i.e. a ‘cap’) equal to the greater of (i) that required for retained securitization exposures, or (ii) the capital requirement that would apply had the exposures not been securitized. In addition, banks must deduct the entire amount of any gain-on-sale and credit enhancing I/Os arising from the securitization transaction in accordance with 4.3.1.1.

4.5.8.3 Mechanics

The originator’s capital charge for the investors’ interest is determined as the product of (a) the investors’ interest, (b) the appropriate CCF, and (c) the risk weight appropriate to the underlying exposure type, as if the exposures had not been securitized. The CCFs depend upon whether the early amortization repays investors through a controlled or non-controlled mechanism. They also differ according to whether the securitized exposures are uncommitted retail credit lines (e.g. credit card receivables) or other credit lines (e.g. revolving corporate facilities). A line is considered uncommitted if it is unconditionally cancelable without prior notice. The CCFs are described in Section 4.5.9.

4.5.9 Determination of CCFs for controlled early amortization features

An early amortization feature is considered controlled when the definition as specified in paragraph 4.1.9 is satisfied.

4.5.9.1 Uncommitted retail exposures

- (a) For uncommitted retail credit lines (e.g. credit card receivables) in securitizations containing controlled early amortization features, banks must compare the three-month average excess spread defined in 4.1.10 to the point at which the bank is required to trap excess spread as economically required by the structure (i.e. excess spread trapping point).
- (b) In cases where such a transaction does not require excess spread to be trapped, the trapping point is deemed to be 4.5 percentage points.
- (c) The bank must divide the excess spread level by the transaction’s excess spread trapping point to determine the appropriate segments and apply the corresponding conversion factors, as outlined in the Table 4.2a
- (d) Banks are required to apply the conversion factors set out above for controlled mechanisms to the investors’ interest referred to in Section 4.5.8.3.

Table 4.2a
Controlled early amortization features

	Uncommitted	Committed
Retail credit line	3-month average excess spread Credit Conversion Factor (CCF) 133.33% of trapping point or more 0% CCF less than 133.33% to 100% of trapping point 1% CCF less than 100% to 75% of trapping point 2% CCF less than 75% to 50% of trapping point 10% CCF less than 50% to 25% of trapping point 20% CCF less than 25% 40% CCF	90% CCF
Non-retail credit lines	90% CCF	90%CCF

4.5.9.2 Other exposures

All other securitized revolving exposures (i.e. those that are committed and all non-retail exposures) with controlled early amortization features will be subject to a CCF of 90% against the off-balance sheet exposures.

4.5.10 Determination of CCFs for non-controlled early amortization features

Early amortization features that do not satisfy the definition of a controlled early Amortization as specified in Section 4.1.9. will be considered non-controlled and treated as follows.

- For uncommitted retail credit lines (e.g. credit card receivables) in securitizations containing non-controlled early amortization features, banks must make the comparison described in paragraphs 4.5.9.1
- The bank must divide the excess spread level by the transaction's excess spread trapping point to determine the appropriate segments and apply the corresponding conversion factors, as outlined in the Table 4.2b.
- All other securitized revolving exposures (i.e. those that are committed and all non-retail exposures) with non-controlled early amortization features will be subject to a CCF of 100% against the off-balance sheet exposures.

Table 4.2b
Non-controlled early amortization features

	Uncommitted	Committed
Retail credit line	3-month average excess spread Credit Conversion Factor (CCF) 133.33% or more of trapping point 0% CCF less than 133.33% to 100% of trapping point 5% CCF less than 100% to 75% of trapping point 15% CCF less than 75% to 50% of trapping point 50% CCF less than 50% of trapping point 100% CCF	100% CCF
Non-retail credit lines	100% CCF	100%CCF

Chapter 5

Capital requirement against Market Risk exposure.

5.1 Definitions

5.1.1 Market risk is the risk of losses due to on and off-balance sheet positions arising out of changes in market prices.

5.1.2 Trading book consists of positions in financial instruments held with trading intent or in order to hedge other elements of the trading book. To be eligible for trading book capital treatment, financial instruments must either be free of any restrictive covenants on their tradability or able to be hedged completely. Generally, Investment in ‘Held for Trading’ and ‘Available for Sale’ portfolios will also inter alia form part of the trading book. In addition, positions should be frequently and accurately valued, and the portfolio should be actively managed. For valuation guidelines see Appendix 5.1.

Positions held with trading intent are those held intentionally for short-term resale and/or with the intent of benefiting from actual or expected short-term price movements or to lock in arbitrage profits, and may include for example proprietary positions, positions arising from client servicing (e.g. matched principal broking) and market making.

The following will be the basic requirements for positions eligible to receive trading book capital treatment.

1. Clearly documented trading strategy for the positions/instruments or portfolios, approved by senior management (which would include expected holding horizon).
2. Clearly defined policies and procedures for the active management of the positions, which must include:
 - positions are managed on a trading desk;
 - position limits are set and monitored for appropriateness;
 - dealers have the autonomy to enter into/manage the positions within agreed limits and according to the agreed strategy;
 - positions are marked to market at least daily and when marking to model the parameters must be assessed on a daily basis;
 - positions are reported to senior management as an integral part of the bank’s risk management process; and
 - positions are actively monitored with reference to market information sources (assessment should be made of the market liquidity or the ability to hedge positions or the portfolio risk profiles). This would include assessing the quality and availability of market inputs to the valuation process, level of market turnover, sizes of positions traded in the market, etc.
3. Clearly defined policy and procedures to monitor the positions against the bank’s trading strategy including the monitoring of turnover and stale positions in the bank’s trading book.

5.1.3 Financial instrument is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Financial instruments include both primary financial instruments (or cash instruments) and derivative financial instruments.

5.1.4 Financial asset is any asset that is cash, the right to receive cash or another financial asset; or the contractual right to exchange financial assets on potentially favorable terms, or an equity instrument.

5.1.5 Financial liability is the contractual obligation to deliver cash or another financial asset or to exchange financial liabilities under conditions that are potentially unfavorable.

5.1.6 Hedge is a position that materially or entirely offsets the component risk elements of another trading book position or portfolio.

5.2. Scope and Coverage of the Capital Charges

The requirement to allocate capital is in respect of the exposure to risks deriving from changes in interest rates and equity prices, in the banks' trading book, and in respect of exposure to risks deriving from changes in foreign exchange rates in the overall banking activity.

On balance sheet assets held in the trading book are subject to only market risk capital requirements and will not be subject to credit risk capital requirement. On balance sheet assets held outside trading book and funded by another currency and unhedged for foreign exchange risk will be subject to both credit and market risk capital requirement. Derivatives, unless they are contracted to hedge positions in the banking book will be considered part of trading book and will be subject to both credit and market risk capital requirement. Repurchase /reverse repurchase, securities lending held in trading book will be subject to both credit and market risk capital requirement.

The total capital requirement for banks against their market risk shall be the sum of;

- i. The capital against interest rate risk and equity position risk in trading book.
- ii. Foreign exchange risk throughout the bank's balance sheet.

Banks using Standardized Approach for credit risk capital requirement for banking book must use Standardized Approach for trading book. Similarly banks using IRB Approaches in banking book must do so for their trading book.

5.3 Standardized Approach for Market Risk

In Standardized Approach the capital requirement for various market risks (interest rate risk, equity price risk, and foreign exchange risk) is determined separately. The total capital requirement in respect of market risk is the sum of capital requirement calculated for each of these market risk sub categories. The methodology to calculate capital requirement under Standardized Approach for each of these market risk categories is as follows.

5.3.1. Interest Rate Risk

The minimum capital requirement against interest rate risk will be the sum of two separately calculated charges. One applying to the "Specific Risk" of each security, whether it is short or a long position, and the other to the interest rate risk in the portfolio (termed as "General Market Risk") where long and short positions can be offset.

5.3.1.1 Specific risk

The capital charge for specific risk, designed to protect against an adverse movement in the price of an individual security owing to factors related to the individual issuer, will be calculated on gross position. However, offsetting is restricted to matched positions in the identical *issues* (including positions in derivatives). Even if the *issuer* is the same, no offsetting will be permitted between different issues since the differences in coupon rates, liquidity, call features, etc. mean that prices may diverge in the short run.

5.3.1.1.1 Specific risk capital charges for issuer risk.

(a) The Specific risk charge is graduated in the following categories:

Categories	External rating grade	Specific risk capital charge
Government (Domestic Currency)	--	0%
Government (Other than Domestic Currency)	1	0%
	2 – 3	0.25% (residual term to final maturity 6 months or less) 1.00% (residual term to final maturity greater than 6 and up to and including 24 months) 1.60% (residual term to final maturity exceeding 24 months)
	4 – 5	8.00%
	6	12.00%
	Unrated	8.00%
Qualifying		0.25% (residual term to final maturity 6 months or less) 1.00% (residual term to final maturity greater than 6 and up to and including 24 months) 1.60% (residual term to final maturity exceeding 24 months)
Other	Similar to credit risk charges under the Standardized Approach of the Basel II Framework, e.g.:	
	4	8.00%
	Below 4	12.00%
	Unrated	8.00%

Note:- The mappings of external credit ratings are as per Table 2.3

- (b) The category "government" will include all the existing approved government securities and such other government securities as may be notified by SBP from time to time. All PKR denominated government securities will be risk weighted at zero percent while for foreign currency denominated securities whether issued by domestic or foreign governments, the criteria given in the above table would apply.
- (c) The "qualifying" category includes securities issued by public sector entities and multilateral development banks, plus other securities that are:
- Rated investment-grade by at least two credit rating agencies on the approved panel of SBP
 - Rated investment-grade by one rating agency and not less than investment-grade by any other rating agency.
 - Unrated but deemed to be of comparable investment quality by the reporting bank and the issuer has securities listed on a recognized stock exchange.

The "other" category will receive the same specific risk charge as a private-sector borrower under the credit risk requirements, i.e. 8%.

5.3.1.1.2 Specific Rules for unrated debt securities

Unrated securities may be included in the "qualifying" category when they are approved by SBP, unrated, but deemed to be of comparable investment quality by the reporting bank, and the issuer has securities listed on a recognized stock exchange. This will remain unchanged for banks using the Standardized Approach. For using the IRB Approach for a portfolio, unrated securities can be included in the "qualifying" category if both of the following conditions are met:

- the securities are rated equivalent²² to investment grade under the reporting bank's internal rating system, which SBP has confirmed complies with the requirements for an IRB Approach; and
- the issuer has securities listed on a recognized stock exchange.

5.3.1.1.3 Specific risk rules for non-qualifying issuers

- (a) Instruments issued by a non-qualifying issuer will receive the same specific risk charge as a non-investment grade corporate borrower under the Standardized Approach for credit risk under the Basel II Framework.
- (b) However, since this may in certain cases considerably underestimate the specific risk for debt instruments which have a high yield to redemption relative to government debt securities, SBP will have the discretion:
 - To apply a higher specific risk charge to such instruments; and/or
 - To disallow offsetting for the purposes of defining the extent of general market risk between such instruments and any other debt instruments.

5.3.1.1.4 Specific risk capital charges for positions hedged by credit derivatives

- (a) Full allowance will be recognized when the values of two legs (i.e. long and short) always move in the opposite direction and broadly to the same extent. This would be the case in the following situations and no specific risk capital requirement applies to both sides of the position:-
 - the two legs consist of completely identical instruments, or
 - a long cash position is hedged by a total rate of return swap (or vice versa) and there is an exact match between the reference obligation and the underlying exposure (i.e. the cash position)²³.
- (b) An 80% offset will be recognized when the value of two legs (i.e. long and short) always moves in the opposite direction but not broadly to the same extent. This would be the case when a long cash position is hedged by a credit default swap or a credit linked note (or vice versa) and there is an exact match in terms of the reference obligation, the maturity of both the reference obligation and the credit derivative, and the currency to the underlying exposure. In addition, key features of the credit derivative contract (e.g. credit event definitions, settlement mechanisms) should not

²² Equivalent means the debt security has a one-year PD equal to or less than the one year PD implied by the long-run average one-year PD of a security rated investment grade or better by a qualifying rating agency.

²³ The maturity of the swap itself may be different from that of the underlying exposure.

cause the price movement of the credit derivative to materially deviate from the price movements of the cash position. To the extent that the transaction transfers risk (i.e. taking account of restrictive payout provisions such as fixed payouts and materiality thresholds), an 80% specific risk offset will be applied to the side of the transaction with the higher capital charge, while the specific risk requirement on the other side will be zero.

- (c) For cases not discussed above, no offset would be allowed and the specific risk capital charge would need to be held against both sides of the position.

5.3.1.2 General market risk capital charge.

The capital requirement for general market risk is designed to capture the risk of loss from changes in market interest rates. A choice between two principal methods of measuring the risk is permitted, a maturity method and a duration method. In each method, positions are allocated across a maturity ladder and the capital charge is then calculated as a sum of four components:

- a. The net short or long weighted position across the whole trading book;
- b. A small proportion of the matched positions in each time band (the vertical disallowance)
- c. A larger proportion of the matched positions across different time bands (the horizontal disallowance)
- d. A net charge for positions in options, where appropriate.

Separate maturity ladder must be used for positions in each major currency wherein the bank has net exposure equal to or more than 5% of its overall net open position. Capital charge should be calculated for each such major currency separately and then summed with no offsetting between positions of different currencies. For the rest of the currencies separate maturity ladder for each currency is not required. Rather, the banks may construct a single maturity ladder and record, within each appropriate time band, the long and short positions in each currency. However, the absolute value of these individual net positions must be summed within each time band irrespective of whether they are long or short positions, to produce a gross position figure.

5.3.1.2.1 The Maturity Method.

- (a) In the **maturity method**, long or short positions in debt securities and other sources of interest rate exposures, including derivative instruments, are slotted into a maturity ladder comprising thirteen time-bands (or fifteen time bands in case of low coupon instruments). Fixed rate instruments should be allocated according to the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date. Opposite positions of the same amount in the same issues (but not different issues by the same issuer), whether actual or notional, can be omitted from the interest rate maturity framework, as well as closely matched swaps, and FRAs which meet the conditions set out in the following pages.
- (b) The first step in the calculation is to weight the positions in each time-band by a factor designed to reflect the price sensitivity of those positions to assumed changes in interest rates. The weights for each time-band are set out in Table 5.1 below. Zero-coupon bonds and deep-discount bonds (defined as bonds with a coupon of less than

3%) should be slotted according to the time-bands set out in the second column of the Table 5.1.

Table 5.1
Maturity method: time-bands and weights

Coupon 3% or more	Coupon less than 3%	Risk weight	Assumed Change in yield
1 month or less	1 month or less	0.00%	1.00
1 to 3 months	1 to 3 months	0.20%	1.00
3 to 6 months	3 to 6 months	0.40%	1.00
6 to 12 months	6 to 12 months	0.70%	1.00
1 to 2 years	1.0 to 1.9 years	1.25%	0.90
2 to 3 years	1.9 to 2.8 years	1.75%	0.80
3 to 4 years	2.8 to 3.6 years	2.25%	0.75
4 to 5 years	3.6 to 4.3 years	2.75%	0.75
5 to 7 years	4.3 to 5.7 years	3.25%	0.70
7 to 10 years	5.7 to 7.3 years	3.75%	0.65
10 to 15 years	7.3 to 9.3 years	4.50%	0.60
15 to 20 years	9.3 to 10.6 years	5.25%	0.60
Over 20 years	10.6 to 12 years	6.00%	0.60
	12 to 20 years	8.00%	0.60
	Over 20 years	12.50%	0.60

- (c) The next step in the calculation is to offset the weighted longs and shorts in each time-band, resulting in a single short or long position for each band. Since each band may include different instruments and different maturities, a 10% capital charge to reflect basis risk and gap risk will be required on the smaller of the offsetting positions, be it long or short. Thus, if the sum of the weighted longs in a time-band is PKR 100 million and the sum of the weighted shorts is PKR 90 million, the so-called "vertical disallowance" for that time-band would be 10% of PKR 90 million (i.e. PKR 9.0 million).
- (d) The result of the above calculations shall produce two sets of weighted positions, the net long or short positions in each time-band (PKR 10 million long in the example above) and the vertical disallowances, which have no sign. In addition, however, banks will be allowed to conduct two rounds of "horizontal offsetting", first between the net positions within each of three zones, and subsequently between the net positions in the three different zones. The offsetting will be subject to a scale of disallowances expressed as a fraction of the matched positions, as set out in Table 5.2 below. The weighted long and short positions in each of three zones may be offset, subject to the matched portion attracting a disallowance factor that is part of the capital charge. The residual net position in each zone may be carried over and offset against opposite positions in other zones, subject to a second set of disallowance factors.

Table 5.2
Horizontal disallowances

Zone	Time-band ²⁴	Within the Zone	Between Adjacent zones	Between zones 1 and 3
	0 - 1 month			
Zone 1	1 to 3 months	40%		
	3 to 6 months			
	6 to 12 months		40%	
	1 to 2 years			
Zone 2	2 to 3 years	30%		
	3 to 4 years			100%
	4 to 5 years		40%	
	5 to 7 years			
Zone 3	7 to 10 years			
	10 to 15 years	30%		
	15 to 20 years			
	Over 20 years			

(e) The general market risk capital charge will be the sum of :

Net position	Net short or long weighted position	x 100%
Vertical disallowances	Matched weighted positions in all time bands	x 10%
Horizontal Disallowances	Matched weighted position within Zone 1	x 40%
	Matched weighted position within Zone 2	x 30%
	Matched weighted position within Zone 3	x 30%
	Matched weighted position between zone 1 & 2	x 40%
	Matched weighted position between zone 2 & 3	x 40%
	Matched weighted position between zone 1 & 3	x 100%

5.3.1.2.2 The Duration Method.

Under the alternative duration method, banks with the necessary capabilities may use a more accurate method of measuring all of their general market risk by calculating the price sensitivity of each position separately. The banks that elect to use this approach must do so on continuous basis. In this method instead of the standard risk weights given in Table 5.1, bank shall calculate the risk weights for each position on the basis of assumed change in yield given in Table 5.3.

The mechanics of this method are as follows:

- Slot all the interest sensitive positions in the trading book into a maturity ladder comprising of fifteen time bands as outlined in Table 5.3.
- Calculate the price sensitivity of each instrument in terms of a change in interest rates of between 0.6 and 1.0 percentage points depending on the maturity of the instrument (as given in Table 5.3).
- Multiply the positions slotted in the various time bands with their respective sensitivity measures to obtain weighted positions;

²⁴ For debt securities with coupons less than 3%, the zones would be “1 year and below”, “1 to 3.6 years” and “3.6 years to 20 years respectively”

- iv) Subject long and short positions in each time-band to a 5% vertical disallowance designed to capture basis risk;
- v) Carry forward the net positions in each time-band for horizontal offsetting subject to the disallowances set out in Table 5.2.
- vi) The capital charge will be the sum of net position, the vertical disallowance and horizontal disallowances as stated earlier.

Table 5.3**Duration method: time-bands and assumed changes in yield**

Assumed change in yield		Assumed change in yield	
Zone 1		Zone 3	
1 month or less	1.00	3.6 to 4.3 years	0.75
1 to 3 months	1.00	4.3 to 5.7 years	0.70
3 to 6 months	1.00	5.7 to 7.3 years	0.65
6 to 12 months	1.00	7.3 to 9.3 years	0.60
		9.3 to 10.6 years	0.60
Zone 2		10.6 to 12 years	0.60
1.0 to 1.9 years	0.90	12 to 20 years	0.60
1.9 to 2.8 years	0.80	Over 20 years	0.60
2.8 to 3.6 years	0.75		

5.3.1.3 Repo / Reverse-Repo Transaction

A security, which is the subject of a repurchase, or securities lending agreement will be treated as if it were still owned by the lender of the security, i.e. it shall be treated in the same manner as other securities positions.

5.3.1.4 Interest Rate Derivatives

The measurement system should include all interest rate derivatives and off-balance sheet instruments in the trading book, which are interest rate sensitive. These include forward rate agreement, interest rate and cross currency swaps and forward foreign exchange contracts. Options are also subject to capital charge; however the calculation of capital requirement for options is set out separately in this section.

5.3.1.4.1 Calculation of Position

The derivatives should be converted into positions in the relevant underlying and become subject to specific and general market risk charges. In order to calculate the standard calculations, the amounts reported should be the market value of the principal amount of the underlying or of the notional underlying. For instruments where the apparent notional amount differs from the effective notional amount, banks must use effective notional amount.

(a) FRAs:

These instruments are treated as a combination of a long and a short position in a notional government security. The maturity of a future or a FRA will be the period until delivery or exercise of the contract, plus - where applicable - the life of the underlying instrument. For example, a long position in a June three month interest rate future (taken in April) is to be reported as a long position in a government

security with a maturity of five months and a short position in a government security with a maturity of two months. Where a range of deliverable instruments may be delivered to fulfill the contract, the bank has flexibility to elect which deliverable security goes into the maturity or duration ladder but should take account of any conversion factor defined by the exchange. In the case of a future on a corporate bond index, positions will be included at the market value of the notional underlying portfolio of securities.

(b) Swaps:

Swaps will be treated as two notional positions in government securities with the relevant maturities. For example an interest rate swap under which a bank is receiving floating rate and paying fixed rate will be treated as a long position in floating rate instrument of maturity equivalent to the period until the next interest fixing and a short position in a fixed rate instrument of maturity equivalent to the residual life of the swap. Both legs of swap are to be reported at their market values (or face value of the notional underlying in case market value is not available). The separate legs of cross-currency swaps are to be reported in the relevant maturity ladders for the currencies concerned.

5.3.1.4.2 Calculation of capital charge for derivatives.

A) Allowable offsetting of matched positions.

- i) Banks may exclude from the interest rate maturity framework altogether (for both specific and general market risk) long and short positions (both actual and notional) in identical instruments with exactly the same issuer, coupon, currency and maturity. A matched position in a future or forward and its corresponding underlying may also be fully offset, and thus excluded from the calculation. When the future or the forward comprises a range of deliverable instruments offsetting of positions in the future or forward contract and its underlying is only permissible in cases where there is a readily identifiable underlying security which is most profitable for the trader with a short position to deliver. The price of this security, sometimes called the “cheapest-to-deliver”, and the price of the future or forward contract should in such cases move in close alignment. No offsetting will be allowed between positions in different currencies; the separate legs of cross-currency swaps or forward foreign exchange deals are to be treated as notional positions in the relevant instruments and included in the appropriate calculation for each currency.
- ii) In addition, opposite positions in the same category of instruments can in certain circumstances be regarded as matched and allowed to offset fully. To qualify for this treatment the positions must relate to the same underlying instruments, be of the same nominal value and be denominated in the same currency. In addition:
 - a) **for futures:** offsetting positions in the notional or underlying instruments to which the futures contract relates must be for identical products and mature within seven days of each other;
 - b) **for swaps and FRAs:** the reference rate (for floating rate positions) must be identical and the coupon closely matched (i.e. within 15 basis points); and

- c) **for swaps, FRAs and forwards:** the next interest fixing date or, for fixed coupon positions or forwards, the residual maturity must correspond within the following limits:
- less than one month hence: same day;
 - between one month and one year hence: within seven days;
 - over one year hence: within thirty days.
- iii) Banks with large swap books may use alternative formulae for these swaps to calculate the positions to be included in the maturity or duration ladder. One method would be to first convert the payments required by the swap into their present values. For that purpose, each payment should be discounted using zero coupon yields, and a single net figure for the present value of the cash flows entered into the appropriate time-band using procedures that apply to zero (or low) coupon bonds; these figures should be slotted into the general market risk framework as set out earlier. An alternative method would be to calculate the sensitivity of the net present value implied by the change in yield used in the maturity or duration method and allocate these sensitivities into the time-bands set out in Table 5.1 or Table 5.3. Other methods, which produce similar results, could also be used. Such alternative treatments will, however, only be allowed if:
- SBP is fully satisfied with the accuracy of the systems being used;
 - the positions calculated fully reflect the sensitivity of the cash flows to interest rate changes and are entered into the appropriate time-bands;
 - the positions are denominated in the same currency.

B) Specific risk

Interest rate and currency swaps, FRAs, forward foreign exchange contracts and interest rate futures will not be subject to a specific risk charge. This exemption also applies to futures on an interest rate index (e.g. KIBOR). However, in the case of futures contracts where the underlying is a debt security, or an index representing a basket of debt securities, a specific risk charge will apply according to the credit risk of the issuer as mentioned earlier.

C) General market risk

General market risk applies to positions in all derivative products in the same manner as for cash positions, subject only to an exemption for fully or very closely matched positions in identical instruments as defined earlier under allowable offsetting of matched positions. The various categories of instruments should be slotted into the maturity ladder and treated according to the rules identified earlier.

Table 5.4

Summary of Treatment of Interest Rate Derivatives

Instrument	Specific risk charge	General market risk charge
Exchange-traded future		
- Government debt security	No	Yes, as two positions
- Corporate debt security	Yes	Yes, as two positions
- Index on interest rates (e.g. KIBOR)	No	Yes, as two positions
OTC forward		
- Government debt security	No	Yes, as two positions
- Corporate debt security	Yes	Yes, as two positions
- Index on interest rates (e.g. KIBOR)	No	Yes, as two positions
FRAs, Swaps	No	Yes, as two positions
Forward foreign exchange	No	Yes, as one position in each currency
Options		Either
- Government debt security	No	(a) Carve out together with the associated hedging positions; – Simplified approach – Scenario analysis – Internal models
- Corporate debt security	Yes	(b) General market risk charge according to the delta-plus method (gamma and vega should receive separate capital charges)
- Index on interest rates (e.g. KIBOR)	No	
- FRAs, Swaps	No	

5.3.2. Equity Position Risk

- (a) As with debt securities, the minimum capital standard for equities is expressed in terms of two separately calculated charges for the “specific risk” of holding a long or short position in an individual equity and for the “general market risk” of holding a long or short position in the market as a whole. Specific risk is defined as the bank’s gross equity positions (i.e. the sum of all long equity positions and of all short equity positions) and general market risk as the difference between the sum of the longs and the sum of the shorts (i.e. the overall net position in an equity market). The long or short position in the market must be calculated on a market-by-market basis, i.e. a separate calculation has to be carried out for each national market in which the bank holds equities.
- (b) The capital charge for specific risk will be 8%. Given the different characteristics of national markets in terms of marketability and concentration, national authorities will have discretion to determine the criteria for liquid and diversified portfolios. The general market risk charge will be 8%.

5.3.2.1 Equity Derivatives

Except for options, equity derivatives and off-balance sheet positions which are affected by changes in equity prices should be included in the measurement system. Where

equities are part of forward contract, a future or an option (quantity of equities to be received or to be delivered), any interest rate or foreign currency exposure from the other leg of the contract should be reported as set out in Section 5.3.1 and 5.3.3. This includes futures and swaps on both individual equities and on stock indices. The derivatives are to be converted into positions in the relevant underlying. The treatment of equity derivatives is summarized in Table 5.5 at the end of this section.

(a) Calculation of positions

In order to calculate the standard formula for specific and general market risk, positions in derivatives should be converted into notional equity positions:-

- futures and forward contracts relating to individual equities should in principle be reported at current market prices;
- futures relating to stock indices should be reported as the marked-to-market value of the notional underlying equity portfolio;
- equity swaps are to be treated as two notional positions. For example, an equity swap in which a bank is receiving an amount based on the change in value of one particular equity or stock index and paying a different index will be treated as a long position in the former and a short position in the latter. Where one of the legs involves receiving/paying a fixed or floating interest rate, that exposure should be slotted into the appropriate repricing time-band for interest rate related instruments as set out in 5.3.1. The stock index should be covered by the equity treatment.
- equity options and stock index options should be either “carved out” together with the associated underlying or be incorporated in the measure of general market risk described in this section according to the delta-plus method

(b) Calculation of Capital Charge

- i) Measurement of specific and general risk: Matched positions in each identical equity or stock index in each market may be fully offset, resulting in a single net short or long position to which the specific and general market risk charges will apply. For example, a future in a given equity may be offset against an opposite cash position in the same equity (the interest rate risk arising out of the future, however should be reported as set out in Section 5.3.1).
- ii) Risk in relation to an index: Besides general market risk, a further capital charge of 2% will apply to the net long or short position in an index contract comprising a diversified portfolio of equities. This capital charge is intended to cover factors such as execution risk. National supervisory authorities will take care to ensure that this 2% risk weight applies only to well-diversified indices and not, for example, to sectoral indices.
- iii) Arbitrage: In the case of the futures-related arbitrage strategies described below, the additional 2% capital charge described above should be applied to only one index with the opposite position exempt from a capital charge. The strategies are:-
 - when the bank takes an opposite position in exactly the same index at different dates or in different market centers;

- when the bank has an opposite position in contracts at the same date in different but similar indices, subject to supervisory oversight that the two indices contain sufficient common components to justify offsetting.

Where a bank engages in a deliberate arbitrage strategy, in which a futures contract on a broadly-based index matches a basket of stocks, it will be allowed to carve out both positions from the standardized methodology on condition that:

- the trade has been deliberately entered into and separately controlled;
- the composition of the basket of stocks represents at least 90% of the index when broken down into its notional components.

In such a case the minimum capital requirement will be 4% (i.e. 2% of the gross value of the positions on each side) to reflect divergence and execution risks. This applies even if all of the stocks comprising the index are held in identical proportions. Any excess value of the stocks comprising the basket over the value of the futures contract or excess value of the futures contract over the value of the basket is to be treated as an open long or short position. If a bank takes a position in depository receipts against an opposite position in the underlying equity or identical equities in different markets, it may offset the position (i.e. bear no capital charge) but only on condition that any costs on conversion are fully taken into account. Any foreign exchange risk arising out of these positions has to be reported as set out in Section 5.3.3.

Table 5.5
Summary of treatment of equity derivatives

Instrument	Specific risk*	General risk
Exchange-traded or OTC futures		
• Individual equity	Yes	Yes is underlying
• Index	2%	Yes is underlying
Options		
• Individual equity	Yes	Either (a) Carve out together with the associated hedging positions; – Simplified approach – Scenario analysis – Internal models
• Index	2%	(b) General market risk charge according to the delta-plus method (gamma and vega should receive separate capital charges)

*This is the specific risk charge relating to the issuer of the instrument. Under the existing credit risk rules, there remains a separate capital for the counterparty risk.

5.3.3. Foreign Exchange Risk

The capital charge for foreign exchange risk will be 8% of bank's overall foreign exchange exposure. The calculation of foreign exchange exposure should be done on consolidated basis including subsidiaries. For less than wholly owned subsidiaries the relevant accounting rules will apply.

5.3.3.1 Measuring the exposure in a single currency.

The bank's net open position in each currency should be calculated by summing:

- i) the net spot position (i.e. all asset items less all liability items, including accrued interest, denominated in the currency in question);
- ii) the net forward position (i.e. all amounts to be received less all amounts to be paid under forward foreign exchange transactions, including currency futures and the principal on currency swaps not included in the spot position);
- iii) guarantees (and similar instruments) that are certain to be called and are likely to be irrecoverable;
- iv) net future income/expenses not yet accrued but already fully hedged (at the discretion of the reporting bank);
- v) any other item representing a profit or loss in foreign currencies;
- vi) the net delta-based equivalent of the total book of foreign currency options.

The treatment of interest, other income and expenses; the measurement of forward currency positions; and the treatment of "structural" positions are described below:-

(a) The treatment of interest, other income and expenses: Interest accrued (i.e. earned but not yet received) should be included as a position. Accrued expenses should also be included. Unearned but expected future interest and anticipated expenses may be excluded unless the amounts are certain and banks have taken the opportunity to hedge them. If banks include future income/expenses, they should do so on a consistent basis, and not be permitted to select only those expected future flows, which reduce their position.

(b) The measurement of forward currency positions: Forward currency positions will normally be valued at current spot market exchange rates. Using forward exchange rates would be inappropriate since it would result in the measured positions reflecting current interest rate differentials to some extent.

(c) The treatment of structural positions:

- i) A matched currency position will protect a bank against loss from movements in exchange rates, but will not necessarily protect its capital adequacy ratio. If a bank has its capital denominated in its domestic currency and has a portfolio of foreign currency assets and liabilities that is completely matched, its capital/asset ratio will fall if the domestic currency depreciates. By running a short position in the domestic currency the bank can protect its capital adequacy ratio, although the position would lead to a loss if the domestic currency were to appreciate. Any position which a bank has deliberately taken in order to hedge partially or totally against the adverse effect of the exchange rate on its capital ratio may be excluded from the calculation of net open currency position, subject to each of the following conditions being met:
 - o such positions need to be of a "structural", i.e. of a non-dealing, nature
 - o the "structural" position excluded does no more than protect the bank's capital adequacy ratio;

- any exclusion of the position needs to be applied consistently, with the treatment of the hedge remaining the same for the life of the assets or other items.
- ii) No capital charge need apply to positions related to items that are deducted from a bank's capital when calculating its capital base, such as investments in non-consolidated subsidiaries, nor to other long-term participations denominated in foreign currencies, which are reported in the published accounts at historic cost. These may also be treated as structural positions.

5.3.3.2 Measuring the foreign exchange risk in a portfolio of foreign currency positions.

- (a) The overall foreign exchange exposure is measured by aggregating the sum of the net short positions or the sum of the net long positions; whichever is the greater, regardless of sign. The capital charge will be 8% of the overall net open position. For example, we may assume that a bank has long and short positions in Yen, Euro, GBP, Australian dollar and US dollar as given below in Table 5.6

Table 5.6
Example (foreign exchange risk)

Currency	YEN	Euro	GBP	AUD	USD
Position in PKR	+40	+300	-130	-20	-150
Absolute Value	+340		-300		

- (b) The capital charge would be 8% of the higher of either the net long currency positions or the net short currency positions (i.e. 340)

$$\text{Capital Requirement} = 340 \times 8\% = 27.20$$

- (c) A bank doing negligible business in foreign currency is exempted from capital requirements for foreign exchange risk provided that:
- a. Its foreign currency business, defined as the greater of the sum of its gross long positions and the sum of its gross short positions in all foreign currencies, does not exceed 100% of eligible capital as defined earlier; **and**
 - b. Its overall net open position as defined in the paragraph above does not exceed 2% of its eligible capital as defined earlier.

5.3.4. Capital Requirement for Options.

5.3.4.1. Simplified Approach

- (a) In the *simplified approach*, the positions for the options and the associated underlying, cash or forward, are not subject to the standardized methodology but rather are "carved-out" and subject to separately calculated capital charges that incorporate both general market risk and specific risk. The risk numbers thus generated are then added to the capital charges for the relevant category, i.e. interest rate related instruments, equities, and foreign exchange. Banks, which handle a limited range of purchased options, only will be free to use the simplified approach mentioned in Table 5.7.

- (b) As an example of how the calculation would work, if a holder of 100 shares currently valued at PKR 10 each holds an equivalent put option with a strike price of PKR 11, the capital charge would be $\text{PKR } 1000 \times 16\%$ (8% specific risk and 8% general market risk charge for equity) = PKR 160 less the amount the option is in the money, $(11 - 10) \times 100 = \text{PKR } 100$. The capital requirement, therefore, will be PKR 60 i.e. $(160 - 100)$. A similar methodology applies for options whose underlying is a foreign currency or an interest rate related instrument.

Table 5.7
Simplified Approach: Capital Charges

Position	Capital Charge
Long Cash and Long Put Or Short Cash and Long Call	The capital charge will be the Market Value of the underlying of the option multiplied by the sum of specific and general market risk charges for the underlying less the amount the option is in the money (if any), with the reduced capital charge bounded at zero.
Long Call Or Long Put	The capital charge will be the lesser of: (i) The market Value of the underlying of the option multiplied by the sum of specific and general market risk charges for the underlying (ii) The market value of the option.

- (c) While using simplified approach following point should be noted:-
- In some cases such as foreign exchange, it may be unclear which side is the “underlying security”; this should be taken to be the asset which would be received if the option were exercised. In addition the nominal value should be used for items where the market value of the underlying instrument could be zero, e.g. caps and floors, swaptions etc.
 - Some options (e.g. where the underlying is an interest rate, a currency or a commodity) bear no specific risk but specific risk will be present in the case of options on certain interest rate related instruments (e.g. options on a corporate debt security or corporate bond index; the relevant capital charges shall be calculated as per Section 5.3.1 and for options on equities and stock indices (see 5.3.2). The charge under this measure for currency options will be 8%.
 - For options with a residual maturity of more than six months the strike price should be compared with the forward, not current, price. A bank unable to do this must take the in the money amount to be zero.
 - Where the position does not fall within the trading book (i.e. options on certain foreign exchange or commodities positions not belonging to the trading book), it may be acceptable to use the book value instead.
 - The banks doing business in certain classes of exotic options (e.g. barriers, digitals) that are close to expiry, may use the internal models approach, to accommodate more detailed revaluation approach.

5.3.4.2. Intermediate approach

5.3.4.2.1 Delta-plus method

- (a) Banks, which write options, will be allowed to include delta-weighted options positions within the standardized methodology. Such options should be reported as a position equal to the market value of the underlying multiplied by the delta. However,

since delta does not sufficiently cover the risks associated with options positions, banks will also be required to measure Gamma (which measures the rate of change of delta) and Vega (which measures the sensitivity of the value of an option with respect to a change in volatility) sensitivities in order to calculate the total capital charge. These sensitivities will be calculated according to an approved exchange model or to the bank's proprietary options pricing model subject to oversight by the national authority.

- (b) Delta-weighted positions with *debt securities or interest rates as the underlying* will be slotted into the interest rate time-bands, as set out in A.1, under the following procedure. A two-legged approach should be used as for other derivatives, requiring one entry at the time the underlying contract takes effect and a second at the time the underlying contract matures. For instance, a bought call option on a June three-month interest-rate future will in April be considered, on the basis of its delta-equivalent value, to be a long position with a maturity of five months and a short position with a maturity of two months. The written option will be similarly slotted as a long position with a maturity of two months and a short position with a maturity of five months. Floating rate instruments with caps or floors will be treated as a combination of floating rate securities and a series of European-style options. For example, the holder of a three-year floating rate bond indexed to six month KIBOR with a cap of 15% will treat it as:
- i) a debt security that re-prices in six months; and
 - ii) a series of five written call options on a FRA with a reference rate of 15%, each with a negative sign at the time the underlying FRA takes effect and a positive sign at the time the underlying FRA matures.
- (c) The capital charge for *options on foreign exchange positions* will be based on the method set out in the capital requirement for foreign exchange risk. For delta risk, the net delta-based equivalent of the foreign currency will be incorporated into the measurement of the exposure for the respective currency positions.
- (d) In addition to the above capital charges arising from delta risk, there will be further capital charges for *gamma* and for *Vega risk*. Banks using the delta-plus method will be required to calculate the gamma and Vega for each option position (including hedge positions) separately. The capital charges should be calculated in the following way:
- i) for ***each individual option*** a "gamma impact" should be calculated according to a Taylor series expansion as:

$$\text{Gamma impact} = \frac{1}{2} \times \text{Gamma} \times \text{VU}^2$$
 where VU = Variation of the underlying of the option.
 - ii) VU will be calculated as follows:
 - for interest rate options if the underlying is a bond, the market value of the underlying should be multiplied by the risk weights set out in Table 5.1. An equivalent calculation should be carried out where the underlying is an interest rate, again based on the assumed changes in the corresponding yield in Table 5.1.

- for options on equities and equity indices: the market value of the underlying should be multiplied by 8%
- for foreign exchange options: the market value of the underlying should be multiplied by 8%;
- iii) For the purpose of this calculation the following positions should be treated as the same underlying for interest rates, each time-band as set out in Table 5.1
 - for equities and stock indices, each national market;
 - for foreign currencies, each currency pair.

The basic rules set out here for interest rate and equity options do not attempt to capture specific risk when calculating gamma capital charges.
- iv) Each option on the same underlying will have a gamma impact that is either positive or negative. These individual gamma impacts will be summed, resulting in a net gamma impact for each underlying that is either positive or negative. Only those net gamma impacts that are negative will be included in the capital calculation.
- v) The total gamma capital charge will be the sum of the absolute value of the net negative gamma impacts as calculated above.
- vi) For **volatility risk**, banks will be required to calculate the capital charges by multiplying the sum of the vegas for all options on the same underlying, as defined above, by a proportional shift in volatility of $\pm 25\%$.
- vii) The **total capital charge** for vega risk will be the sum of the absolute value of the individual capital charges that have been calculated for vega risk.

5.4. Use of Internal Models Approach to measure Market Risk

5.4.1. General criteria

The use of an internal model will be conditional upon the explicit approval of SBP. SBP will only give its approval if at a minimum:

- it is satisfied that the bank's risk management system is conceptually sound and is implemented with integrity;
- the bank has sufficient numbers of staff skilled in the use of sophisticated models not only in the trading area but also in the risk control, audit, and if necessary, back office areas;
- the bank's models have a proven track record of reasonable accuracy in measuring risk;
- the bank regularly conducts stress tests along the lines discussed in.

In addition to these general criteria, banks using internal models for capital purposes will be subject to the requirements specified on following pages.

5.4.2. Qualitative standards

SBP will evaluate before granting permission that the model(s) are in full compliance with the qualitative criteria given below:

- a. The bank should have an independent risk control unit that is responsible for the design and implementation of the bank's risk management system. The unit should produce and analyze daily reports on the output of the bank's risk measurement model, including an evaluation of the relationship between measures of risk exposure

and trading limits. This unit must be independent from business trading units and should report directly to senior management of the bank.

- b. The unit should conduct a regular back testing program, i.e. an ex-post comparison of the risk measure generated by the model against actual daily changes in portfolio value over longer periods of time, as well as hypothetical changes based on static positions.
- c. Board of directors and senior management should be actively involved in the risk control process and must regard risk control as an essential aspect of the business to which significant resources need to be devoted. In this regard, the daily reports prepared by the independent risk control unit must be reviewed by a level of management with sufficient seniority and authority to enforce both reductions of positions taken by individual traders and reductions in the bank's overall risk exposure.
- d. The bank's internal risk measurement model must be closely integrated into the day-to-day risk management process of the bank. Its output should accordingly be an integral part of the process of planning, monitoring and controlling the bank's market risk profile.
- e. The risk measurement system should be used in conjunction with internal trading and exposure limits. In this regard, trading limits should be related to the bank's risk measurement model in a manner that is consistent over time and that is well understood by both traders and senior management.
- f. A routine and rigorous program of stress testing should be in place as a supplement to the risk analysis based on the day-to-day output of the bank's risk measurement model. The results of stress testing should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors. Where stress tests reveal particular vulnerability to a given set of circumstances, prompt steps should be taken to manage those risks appropriately (e.g. by hedging against that outcome or reducing the size of the bank's exposures).
- g. Bank should have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system. The bank's risk measurement system must be well documented, for example, through a risk management manual that describes the basic principles of the risk management system and that provides an explanation of the empirical techniques used to measure market risk.
- h. An independent review of the risk measurement system should be carried out regularly in the bank's own internal auditing process. This review should include both the activities of the business trading units and of the independent risk control unit. 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 adequacy of the documentation of the risk management system and process;
 - the organization of the risk control unit;
 - the integration of market risk measures into daily risk management;
 - the approval process for risk pricing models and valuation systems used by front and back-office personnel;
 - the validation of any significant change in the risk measurement process;
 - the scope of market risks captured by the risk measurement model;

- the integrity of the management information system;
- 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;
- the accuracy and appropriateness of volatility and correlation assumptions;
- the accuracy of valuation and risk transformation calculations;
- the verification of the model's accuracy through frequent back-testing.

5.4.3 Specification of market risk factors

An important part of a bank's internal market risk measurement system is the specification of an appropriate set of market risk factors, i.e. the market rates and prices that affect the value of the bank's trading positions. The risk factors contained in a market risk measurement system should be sufficient to capture the risks inherent in the bank's portfolio of on- and off-balance sheet trading positions. Although banks will have some discretion in specifying the risk factors for their internal models, the following guidelines should be fulfilled.

- For interest rates, there must be a set of risk factors corresponding to interest rates in each currency in which the bank has interest-rate-sensitive on- or off-balance sheet positions.
 - The risk measurement system should model the yield curve using one of a number of generally accepted approaches, for example, by estimating forward rates of zero coupon yields. The yield curve should be divided into various maturity segments in order to capture variation in the volatility of rates along the yield curve; there will typically be one risk factor corresponding to each maturity segment. For material exposures to interest rate movements in the major currencies and markets, banks must model the yield curve using a minimum of six risk factors. However, the number of risk factors used should ultimately be driven by the nature of the bank's trading strategies. For instance, a bank with a portfolio of various types of securities across many points of the yield curve and that engages in complex arbitrage strategies would require a greater number of risk factors to capture interest rate risk accurately.
 - The risk measurement system must incorporate separate risk factors to capture spread risk (e.g. between bonds and swaps). A variety of approaches may be used to capture the spread risk arising from less than perfectly correlated movements between government and other fixed-income interest rates, such as specifying a completely separate yield curve for non-government fixed-income instruments (for instance, swaps or municipal securities) or estimating the spread over government rates at various points along the yield curve.
- For *exchange rates*, the risk measurement system should incorporate risk factors corresponding to the individual foreign currencies in which the bank's positions are denominated. Since the value-at-risk figure calculated by the risk measurement system will be expressed in the bank's domestic currency, any net position denominated in a foreign currency will introduce a foreign exchange risk. Thus, there must be risk factors corresponding to the exchange rate between the domestic currency and each foreign currency in which the bank has a significant exposure.

- c. For *equity prices*, there should be risk factors corresponding to each of the equity markets in which the bank holds significant positions:
- at a minimum, there should be a risk factor that is designed to capture market-wide movements in equity prices (e.g. a market index). Positions in individual securities or in sector indices could be expressed in "beta-equivalents"²⁵ relative to this market-wide index;
 - a somewhat more detailed approach would be to have risk factors corresponding to various sectors of the overall equity market (for instance, industry sectors or cyclical and non-cyclical sectors). As above, positions in individual stocks within each sector could be expressed in beta-equivalents relative to the sector index;
 - the most extensive approach would be to have risk factors corresponding to the volatility of individual equity issues. The sophistication and nature of the modeling technique for a given market should correspond to the bank's exposure to the overall market as well as its concentration in individual equity issues in that market.

5.4.4. Quantitative standards

Banks will have flexibility in devising the precise nature of their models, but the following minimum standards will apply for the purpose of calculating their capital charge. Individual banks or their supervisory authorities will have discretion to apply stricter standards.

- a) "*Value-at-risk*" must be computed on a daily basis.
- b) In calculating the value-at-risk, a 99th percentile, one-tailed *confidence interval* is to be used.
- c) In calculating value-at-risk, an instantaneous price shock equivalent to a 10-day movement in prices is to be used, i.e. the minimum "*holding period*" will be ten trading days. Banks may use value-at-risk numbers calculated according to shorter holding periods scaled up to ten days by the square root of time.
- d) The choice of *historical observation period* (sample period) for calculating value-at-risk will be constrained to a minimum length 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 (that is, the weighted average time lag of the individual observations cannot be less than 6 months).
- e) 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.
- f) No particular *type of model* is prescribed. So long as each model used captures all the material risks run by the bank. Banks will be free to use models based, for example, on variance-covariance matrices, historical simulations, or Monte Carlo simulations.
- g) Banks will have discretion to recognize empirical *correlations* within broad risk categories (e.g. interest rates, exchange rates, equity prices and, including related options volatilities in each risk factor category).

²⁵ A "beta-equivalent" position would be calculated from a market model of equity price returns (such as the CAPM model) by regressing the return on the individual stock or sector index on the risk-free rate of return and the return on the market index.

- h) Banks' models must accurately capture the unique risks associated with *options* within each of the broad risk categories. The following criteria apply to the measurement of options risk:
 - i. banks' models must capture the *non-linear price characteristics* of options positions;
 - ii. banks are expected to ultimately move towards the application of a full 10-day price shock to options positions or positions that display option-like characteristics.
 - iii. each bank's risk measurement system must have a set of risk factors that captures the *volatilities of the rates and prices* underlying option positions, i.e. vega risk.
- i) Each bank must meet, on a daily basis, a *capital requirement* expressed as the higher of (i) its previous day's value-at-risk number measured according to the parameters specified in this section and (ii) an average of the daily value-at-risk measures on each of the preceding sixty business days, multiplied by a multiplication factor.
- j) The *multiplication factor* will be set by SBP on the basis of its assessment of the quality of the bank's risk management system, subject to an absolute minimum of 3. Banks will be required to add to this factor a "plus" directly related to the ex-post performance of the model, thereby introducing a built-in positive incentive to maintain the predictive quality of the model.
- k) Banks using models will also be subject to a capital charge to cover specific risk (as defined under the Standardized Approach) of interest rate related instruments and equity securities.

5.4.5. Stress testing

- (a) Banks that use the internal models approach for meeting market risk capital requirements must have in place a rigorous and comprehensive stress-testing program. Stress testing to identify events or influences that could greatly impact banks is a key component of a bank's assessment of its capital position.
- (b) Bank's stress scenarios need to cover a range of factors that can create extraordinary losses or gains in trading portfolios, or make the control of risk in those portfolios very difficult. These factors include low-probability events in all major types of risks, including the various components of market, credit, and operational risks. Stress scenarios need to shed light on the impact of such events on positions that display both linear and non-linear price characteristics (i.e. options and instruments that have options-like characteristics).
- (c) Banks' stress tests should be both of a quantitative and qualitative nature, incorporating both market risk and liquidity aspects of market disturbances. Quantitative criteria should identify plausible stress scenarios to which banks could be exposed. Qualitative criteria should emphasize that two major goals of stress testing are to evaluate the capacity of the bank's capital to absorb potential large losses and to identify steps the bank can take to reduce its risk and conserve capital. This assessment is integral to setting and evaluating the bank's management strategy and the results of stress testing should be routinely communicated to senior management and, periodically, to the bank's board of directors.

Banks should combine the use of supervisory stress scenarios with stress tests developed by banks themselves to reflect their specific risk characteristics. Specifically, supervisory

authorities may ask banks to provide information on stress testing in three broad areas, which are discussed in turn below.

5.4.5.1. Supervisory scenarios requiring no simulations by the bank

Banks should have information on the largest losses experienced during the reporting period available for SBP review. This loss information could be compared to the level of capital that results from a bank's internal measurement system. For example, it could provide SBP with a picture of how many days of peak day losses would have been covered by a given value-at-risk estimate.

5.4.5.2. Scenarios requiring a simulation by the bank

Banks should subject their portfolios to a series of simulated stress scenarios and provide supervisory authorities with the results. These scenarios could include testing the current portfolio against past periods of significant disturbance, for example, the May 1998 equity crash incorporating both the large price movements and the sharp reduction in liquidity associated with these events. A second type of scenario would evaluate the sensitivity of the bank's market risk exposure to changes in the assumptions about volatilities and correlations. Applying this test would require an evaluation of the historical range of variation for volatilities and correlations and evaluation of the bank's current positions against the extreme values of the historical range. Due consideration should be given to the sharp variation that at times has occurred in a matter of days in periods of significant market disturbance.

5.4.5.3 Scenarios developed by the bank itself to capture the specific characteristics of its portfolio.

In addition to the scenarios prescribed by SBP mentioned above, a bank should also develop its own stress tests which it identifies as most adverse based on the characteristics of its portfolio (e.g. problems in a key region of the world combined with a sharp move in oil prices). Bank should provide supervisory authorities with a description of the methodology used to identify and carry out the scenarios, as well as with a description of the results derived from these scenarios.

The results should be reviewed periodically by senior management and should be reflected in the policies and limits set by management and the board of directors.

5.4.6. External validation

The validation of models' accuracy by external auditors should at a minimum include the following steps:

- a) verifying that the *internal validation processes* are operating in a satisfactory manner;
- b) ensuring that the *formulae* used in the calculation process as well as for the pricing of options and other complex instruments are validated by a qualified unit, which in all cases should be independent from the trading area;
- c) checking that the *structure* of internal models is adequate with respect to the bank's activities and geographical coverage;
- d) checking the results of the banks' *back-testing* of its internal measurement system (i.e. comparing value-at-risk estimates with actual profits and losses) to ensure that the model provides a reliable measure of potential losses over time. This means that bank should make the results as well as the underlying inputs to their value-at-risk

calculations available to their supervisory authorities and/or external auditors on request;

- e) making sure that data flows and processes associated with the risk measurement system are *transparent and accessible*. In particular, it is necessary that auditors are in a position to have easy access, whenever they judge it necessary and under appropriate procedures, to the models' specifications and parameters.

5.4.7. Combination of internal models and the standardized methodology

Unless a bank's exposure to a particular risk factor, such as equity prices, is insignificant, the internal models approach will in principle require banks to have an integrated risk measurement system that captures the broad risk factor categories (i.e. interest rates, exchange rates, and equity prices, with related options volatilities being included in each risk factor category). Thus, banks which start to use models for one or more risk factor categories will, over time, be expected to extend the models to all their market risks. A bank which has developed one or more models will no longer be able to revert to measuring the risk measured by those models according to the standardized methodology (unless SBP withdraws approval for that model). The following conditions will apply to banks using such combinations:

- a) each broad risk factor category must be assessed using a single approach (either internal models or the Standardized Approach), i.e. no combination of the two methods will in principle be permitted within a risk category or across banks' different entities for the same type of risk.
- b) all the criteria laid down in will apply to the models being used;
- c) banks may not modify the combination of the two approaches they use without justifying to SBP that they have a good reason for doing so;
- d) no element of market risk may escape measurement, i.e. the exposure for all the various risk factors, whether calculated according to the Standardized Approach or internal models, would have to be captured;
- e) the capital charges assessed under the Standardized Approach and under the models approach are to be aggregated according to the simple sum method.

5.4.8. Treatment of specific risk

Banks using models will be permitted to base their specific risk capital charge on modeled estimates if they meet all of the qualitative and quantitative requirements for general risk models as well as additional criteria set out below. Banks which are unable to meet these additional criteria will be required to base their specific risk capital charge on the full amount of the standardized-based specific risk charge. The criteria for applying modeled estimates of specific risk require that a bank's model:

- explain the historical price variation in the portfolio;
- demonstrably capture concentration (magnitude and changes in composition);
- be robust to an adverse environment; and
- be validated through back-testing aimed at assessing whether specific risk is being accurately captured.
- In addition, the bank must be able to demonstrate that it has methodologies in place which allow it to adequately capture event and default risk for its traded-debt and equity positions.

Banks which apply modeled estimates of specific risk are required to conduct back-testing aimed at assessing whether specific risk is being accurately captured. The methodology a bank should use for validating its specific risk estimates is to perform separate back-tests on sub-portfolios using daily data on sub-portfolios subject to specific risk. The key sub-portfolios for this purpose are traded-debt and equity positions. However, if a bank itself decomposes its trading portfolio into finer categories (e.g., emerging markets, traded corporate debt, etc.), it is appropriate to keep these distinctions for sub-portfolio back-testing purposes. Banks are required to commit to a sub-portfolio structure and stick to it unless it can be demonstrated to the supervisor that it would make sense to change the structure.

Banks are required to have in place a process to analyze exceptions identified through the back-testing of specific risk. This process is intended to serve as the fundamental way in which banks correct their models of specific risk in the event they become inaccurate.

Appendix 5.1

Prudent valuation guidance

A framework for prudent valuation practices should at a minimum include the following:

1. *Systems and controls*

Banks must establish and maintain adequate systems and controls sufficient to give management and supervisors the confidence that their valuation estimates are prudent and reliable. These systems must be integrated with other risk management systems within the organization (such as credit analysis). Such systems must include:

- Documented policies and procedures for the process of valuation. This includes clearly defined responsibilities of the various areas involved in the determination of the valuation, sources of market information and review of their appropriateness, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations, end of the month and ad-hoc verification procedures; and
- Clear and independent (i.e. independent of front office) reporting lines for the department accountable for the valuation process. The reporting line should ultimately be to a main board executive director.

2. *Valuation methodologies*

(i) *Marking to market*

Marking-to-market is at least the daily valuation of positions at readily available close out prices that are sourced independently. Examples of readily available close out prices include exchange prices, screen prices, or quotes from several independent reputable brokers.

Banks must mark-to-market as much as possible. The more prudent side of bid/offer must be used unless the bank is a significant market maker in a particular position type and it can close out at mid-market.

(ii) *Marking to model*

Where marking-to-market is not possible, banks may mark-to-model, where this can be demonstrated to be prudent. Marking-to-model is defined as any valuation which has to be benchmarked, extrapolated or otherwise calculated from a market input. When marking to model, an extra degree of conservatism is appropriate. SBP will consider the following in assessing whether a mark-to-model valuation is prudent:

- Senior management should be aware of the elements of the trading book which are subject to mark to model and should understand the materiality of the uncertainty this creates in the reporting of the risk/performance of the business.
- Market inputs should be sourced, to the extent possible, in line with market prices. The appropriateness of the market inputs for the particular position being valued should be reviewed regularly.
- Where available, generally accepted valuation methodologies for particular products should be used as far as possible.
- Where the model is developed by the bank itself, it should be based on appropriate assumptions, which have been assessed and challenged by suitably qualified parties independent of the development process. The model should be developed or approved independently of the front office. It should be independently tested. This includes validating the mathematics, the assumptions and the software implementation.
- There should be formal change control procedures in place and a secure copy of the model should be held and periodically used to check valuations.
- Risk management should be aware of the weaknesses of the models used and how best to reflect those in the valuation output.
- The model should be subject to periodic review to determine the accuracy of its performance (e.g. assessing continued appropriateness of the assumptions, analysis of P&L versus risk factors, comparison of actual close out values to model outputs).

Appendix 5.1 (continued)

(iii) Independent price verification

Independent price verification is distinct from daily mark-to-market. It is the process by which market prices or model inputs are regularly verified for accuracy. While daily marking-to-market may be performed by dealers, verification of market prices or model inputs should be performed by a unit independent of the dealing room, at least monthly (or, depending on the nature of the market/trading activity, more frequently). It need not be performed as frequently as daily mark-to-market, since the objective, i.e. independent, marking of positions, should reveal any error or bias in pricing, which should result in the elimination of inaccurate daily marks.

Independent price verification entails a higher standard of accuracy in that the market prices or model inputs are used to determine profit and loss figures, whereas daily marks are used primarily for management reporting in between reporting dates. For independent price verification, where pricing sources are more subjective, e.g. only one available broker quote, prudent measures such as valuation adjustments may be appropriate.

Chapter 6: Operational Risk

6.1. Definition

Operational risk is the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk²⁶, but excludes strategic and reputational risk.

6.2. The measurement methodologies

There are methods for calculating operational risk capital charges. These are;

- Basic Indicator Approach (BIA)
- The Standardized Approach (TSA)
- Alternative Standardized Approach (ASA)
- Advanced Measurement Approach (AMA)

However, as envisaged in the roadmap issued by SBP, banks may choose to adopt either Basic Indicator Approach or Standardized Approach. Adoption of Advanced Approach is not totally ruled out. Depending upon the data availability, sensitivity and the sophistication of risk management framework, banks may employ Advanced Approach subject to fulfilling respective qualifying criteria and obtaining specific approval from SBP. In-fact, banks are encouraged to move along the spectrum of available approaches as they develop more sophisticated operational risk measurement systems and practices. Similar to market risk, these measurement methodologies will directly give the capital requirement against operational risk. Consequently the corresponding Risk Weighted Assets (RWA) will be derived by multiplying the resulting figure with 12.5.

While as a point of entry towards capital calculation against operational risk there is no qualifying criteria for using Basic Indicator Approach, banks are expected to follow the guidelines relating to operational risk management issued vide BSD circular 7 dated 15 August 2003.

6.2.1. Basic Indicator Approach

Under BIA the capital charge for operational risk is a fixed percentage (denoted alpha) of average positive annual gross income of the bank over the past three years. Figures for any year in which annual gross income is negative or zero, should be excluded from both the numerator and denominator when calculating the average. The charge may be expressed as follows:

$$K_{BIA} = \left[\sum (GI_{1...n} \times \alpha) \right] / n$$

Where:-

K_{BIA} = the capital charge under the Basic Indicator Approach

GI = annual gross income, where positive, over the previous three years

n = number of the previous three years for which gross income is positive

α = 15%.

²⁶ Legal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements.

Gross income is defined as the sum of net interest income and net non-interest income and shall be arrived at before accounting for:

- (i) Provisions, including those for credit impairment;
- (ii) operating expenses (including fees in respect of outsourced services)
- (iii) realized profits/ losses from the sale of securities held to maturity and available for sale;
- (iv) extraordinary items, classified as such by accounting standards and conventions; and
- (v) income derived from insurance.

6.2.2. The Standardized Approach (TSA)

In the Standardized Approach, all the business activities of the banks will be divided into eight business lines: corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage. Banks are advised to map their operations to the eight business lines using Appendix 6.1.

Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. The values of Beta for the eight business lines are given in Table 6.1. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. It should be noted that in the Standardized Approach gross income is measured for each business line, not the whole bank, i.e. in corporate finance, the indicator is the gross income generated in the corporate finance business line only.

The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit. However, where the aggregate capital charge across all business lines within a given year is negative, then the input to the numerator for that year will be zero. The total capital charge may be expressed as:

$$K_{TSA} = \{\sum_{\text{years } 1-n} \max[\sum (GI_{1-8} \times \beta_{1-8}), 0]\} / n$$

Where:

- K_{TSA} = the capital charge under the Standardized Approach
- GI_{1-8} = annual gross income in a given year, as defined above in the Basic Indicator Approach, for each of the eight business lines
- β_{1-8} = a fixed percentage, as given table 6.1

Table 6.1

Business Lines Beta Factors	
Corporate finance	18%
Trading and sales	18%
Retail banking	12%
Commercial banking	15%
Payment and settlement	18%
Agency services	15%
Asset management	12%
Retail brokerage	12%

6.2.3. The Alternative Standardized Approach (ASA)

Under the ASA, the operational risk capital charge/methodology is the same as for the Standardized Approach except for two business lines – retail banking and commercial banking. For these business lines, loans and advances – multiplied by a fixed factor ‘m’ replace gross income as the exposure indicator. The betas for retail and commercial banking are unchanged from the Standardized Approach. The ASA operational risk capital charge for retail banking (with the same basic formula for commercial banking) can be expressed as:

$$K_{RB} = \beta_{RB} \times m \times LA_{RB}$$

Where:-

K_{RB} is the capital charge for the retail banking business line

β_{RB} is the beta for the retail banking business line

LA_{RB} is total outstanding retail loans and advances (non-risk weighted and gross of provisions), averaged over the past three years and

m is constant the value of which is **0.035**

For the purposes of the ASA, total loans and advances in the retail banking business line consists of the total drawn amounts in the following credit portfolios: retail, SMEs treated as retail, and purchased retail receivables. For commercial banking, total loans and advances consist of the drawn amounts in the following credit portfolios: corporate, sovereign, bank, specialized lending, SMEs treated as corporate and purchased corporate receivables. The book value of securities held in the banking book should also be included.

Under the ASA, banks may aggregate retail and commercial banking (if they wish to) using a beta of 15%. Similarly, those banks that are unable to disaggregate their gross income into the other six business lines can aggregate the total gross income for these six business lines using a beta of 18%, with negative gross income treated as described above.

As under the Standardized Approach, the total capital charge for the ASA is calculated as the simple summation of the regulatory capital charges across each of the eight business lines.

6.3. Qualifying criteria

6.3.1. The Standardized Approach (TSA)

In order to qualify for use of the Standardized Approach, a bank must satisfy SBP that, at a minimum:

- a) Its board of directors and senior management, as appropriate, are actively involved in the oversight of the operational risk management framework;
- b) It has an operational risk management system with clear responsibilities assigned to an operational risk management function. The operational risk management function is responsible for developing strategies to identify, assess, monitor and control/mitigate operational risk; for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk assessment methodology; and for the design and implementation of a risk-reporting system for operational risk.
- c) As part of the internal operational risk assessment system, the bank has a system to systematically track relevant operational risk data including material losses by business line. Its operational risk assessment system must be closely integrated into the risk management processes. Its output must be an integral part of the process of monitoring and controlling the banks operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, and risk analysis. The bank must have techniques for creating incentives to improve the management of operational risk throughout the organization.
- d) It has a system of reporting of operational risk exposures, including material operational losses, to business unit management, senior management, and to the board of directors. The bank must have procedures for taking appropriate action according to the information within the management reports.
- e) Its operational risk management systems are well documented. The bank must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of noncompliance issues.
- f) Its operational risk management processes and assessment system are subject to validation and regular independent review. These reviews must include both the activities of the business units and of the operational risk management function.
- g) Its operational risk assessment system (including the internal validation processes) is subject to regular review by external auditors.

SBP, before granting permission to use TSA, may require a parallel run for a period of at least one year during which it will closely monitor the capital allocation under intended approach.

Appendix 6.1

Mapping of Business Lines*

Level 1	Level 2	Activity Groups
Corporate Finance	Corporate Finance	Mergers and acquisitions, underwriting, privatizations, securitization, research, debt (government, high yield), equity, syndications, IPO, secondary private placements
	Municipal/Government Finance	
	Merchant Banking	
	Advisory Services	
Trading & Sales	Sales	Fixed income, equity, foreign exchanges, commodities, credit, funding, own position securities, lending and repos, brokerage, debt, prime brokerage
	Market Making	
	Proprietary Positions	
	Treasury	
Retail Banking	Retail Banking	Retail lending and deposits, banking services, trust and estates
	Private Banking	Private lending and deposits, banking services, trust and estates, investment advice
	Card Services	Merchant/commercial/corporate cards, private labels and retail
Commercial Banking	Commercial Banking	Project finance, real estate, export finance, trade finance, factoring, leasing, lending, guarantees, bills of exchange
Payment and Settlement**	External Clients	Payments and collections, funds transfer, clearing and & Settlement
Agency Services	Custody	Escrow, depository receipts, securities lending (customers) corporate actions
	Corporate Agency	Issuer and paying agents
	Corporate Trust	
Asset Management	Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open, private Equity
	Non-Discretionary Fund Management	Pooled, segregated, retail, institutional, closed, open
Retail Brokerage	Retail Brokerage	Execution and full service

* Supplementary business line mapping guidance

There are a variety of valid approaches that banks can use to map their activities to the eight business lines, provided the approach used meets the business line mapping principles. The following is an example of one possible approach that could be used by a bank to map its gross income:

Gross income for retail banking consists of net interest income on loans and advances to retail customers and SMEs treated as retail, plus fees related to traditional retail activities, net income from swaps and derivatives held to hedge the retail banking book, and income on purchased retail receivables. To calculate net interest income for retail banking, a bank/DFI takes the interest earned on its loans and advances to retail customers less the weighted average cost of funding of the loans (from whatever source — retail or other deposits).

Similarly, gross income for commercial banking consists of the net interest income on loans and advances to corporate (plus SMEs treated as corporate), inter-bank and sovereign customers and income on purchased corporate receivables, plus fees related to traditional commercial banking activities including commitments, guarantees, bills of exchange, net income (e.g. from coupons and dividends) on securities held in the banking book, and profits/losses on swaps and derivatives held to hedge the commercial banking book. Again, the calculation of net interest income is based on interest earned on loans and advances to corporate, inter-bank and sovereign customers less the weighted average cost of funding for these loans (from whatever source).

For trading and sales, gross income consists of profits/losses on instruments held for trading purposes (i.e. in the mark-to-market book), net of funding cost, plus fees from wholesale broking.

For the other five business lines, gross income consists primarily of the net fees/commissions earned in each of these businesses. Payment and settlement consists of fees to cover provision of payment/settlement facilities for wholesale counterparties. Asset management is management of assets on behalf of others.

** Payment and settlement losses related to a bank's own activities would be incorporated in the loss experience of the affected business line.

Principles for business line mapping

- a) All activities must be mapped into the eight level-1 business lines in a mutually exclusive and jointly exhaustive manner.
- b) Any banking or non-banking activity which cannot be readily mapped into the business line framework, but which represents an ancillary function to an activity included in the framework, must be allocated to the business line it supports. If more than one business line is supported through the ancillary activity, an objective mapping criteria must be used.
- c) When mapping gross income, if an activity cannot be mapped into a particular business line then the business line yielding the highest charge must be used. The same business line equally applies to any associated ancillary activity.
- d) Banks may use internal pricing methods to allocate gross income between business lines provided that total gross income for the bank (as would be recorded under the Basic Indicator Approach) still equals the sum of gross income for the eight business lines.
- e) The mapping of activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations in other risk categories, i.e. credit and market risk. Any deviations from this principle must be clearly motivated and documented.
- f) The mapping process used must be clearly documented. In particular, written business line definitions must be clear and detailed enough to allow third parties to replicate the business line mapping. Documentation must, among other things, clearly motivate any exceptions or overrides and be kept on record.
- g) Processes must be in place to define the mapping of any new activities or products.
- h) Senior management is responsible for the mapping policy (which is subject to the approval by the board of directors).
- i) The mapping process to business lines must be subject to independent review.

Table 6.2
Detailed Loss Event Type Classification

Event Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Internal fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity/discrimination events, which involves at least one internal party	Unauthorized Activity	Transactions not reported (intentional) Transaction type unauthorized (w/monetary loss) Mis-marking of position (intentional)
		Theft and Fraud	Fraud / credit fraud / worthless deposits Theft / extortion / embezzlement / robbery Misappropriation of assets Malicious destruction of assets Forgery Check kiting Smuggling Account take-over / impersonation / etc. Tax non-compliance / evasion (willful) Bribes / kickbacks Insider trading (not on firm's account)
External Fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party	Theft and Fraud	Theft/Robbery Forgery Check kiting
		Systems Security	Hacking damage Theft of information (w/monetary loss)
Employment Practices and Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity / discrimination events	Employee Relations	Compensation, benefit, termination issues Organized labor activity
		Safe Environment	General liability (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity & Discrimination	All discrimination types

Event Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
Clients, Products & Business Practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product.	Suitability, Disclosure & Fiduciary	Fiduciary breaches / guideline violations Suitability / disclosure issues (KYC, etc.) Retail customer disclosure violations Breach of privacy Aggressive sales Account churning Misuse of confidential information Legal Liability
		Improper Business or Market Practices	Antitrust Improper trade / market practices Market manipulation Insider trading (on firm's account) Unlicensed activity Money laundering
		Product Flaws	Product defects (unauthorized, etc.) Model errors
		Selection, Sponsorship & Exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory Activities	Disputes over performance of advisory activities
Damage to Physical Assets	Losses arising from loss or damage to physical assets from natural disaster or other events.	Disasters and other events	Natural disaster losses Human losses from external sources (terrorism, vandalism)
Business disruption and system failures	Losses arising from disruption of business or system failures	Systems	Hardware, Software, Telecommunications, Utility outage / disruptions
Execution, Delivery & Process Management	Losses from failed transaction processing or process management, from relations with trade counterparties and vendors	Transaction Capture, execution & Maintenance	Miscommunication Data entry, maintenance or loading error Missed deadline or responsibility Model / system mis-operation Accounting error / entity attribution error Other task mis-performance Delivery failure Collateral management failure Reference Data Maintenance

Event Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
		Monitoring and Reporting	Failed mandatory reporting obligation Inaccurate external report (loss incurred)
		Customer Intake and Documentation	Client permissions / disclaimers missing Legal documents missing / incomplete
		Customer / Client Account Management	Unapproved access given to accounts Incorrect client records (loss incurred) Negligent loss or damage of client assets
		Trade Counterparties	Non-client counterparty misperformance Misc. non-client counterparty disputes
		Vendors & suppliers	Outsourcing Vendor disputes

Part II

Supervisory Review Process

Internal capital adequacy assessment process (ICAAP)

The key principle of the ICAAP is that banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels. Banks must be able to demonstrate that chosen internal capital targets are well founded and that these targets are consistent with their overall risk profile and current operating environment. In assessing capital adequacy, bank management needs to be mindful of the particular stage of the business cycle in which the bank is operating. Rigorous, forward-looking stress testing that identifies possible events or changes in market conditions that could adversely impact the bank should be performed. Bank management clearly bears primary responsibility for ensuring that the bank has adequate capital to support its risks. The ICAAP is a rigorous process which includes; the board of directors and senior management oversight; sound capital assessment; comprehensive assessment of risks; monitoring and reporting and internal control reviews. The main features of an effective ICAAP are discussed below.

1. Board and senior management oversight

A sound risk management process is the foundation for an effective assessment of the adequacy of a bank's capital position. Bank management is responsible for understanding the nature and level of risk being taken by the bank and how this risk relates to adequate capital levels. It is also responsible for ensuring that the formality and sophistication of the risk management processes commensurate with the complexity of operations of the bank.

The analysis of a bank's current and future capital requirements in relation to its strategic objectives is a vital element of the strategic planning process. The strategic plan should clearly outline the bank's capital needs, anticipated capital expenditures, desirable capital level, and external capital sources. Senior management and the board should view capital planning as a crucial element in being able to achieve its desired strategic objectives.

The bank's board of directors has responsibility for setting the bank's level of risk tolerance. It should also ensure that management establishes a framework for assessing the various risks, develops a system to relate risk to the bank's capital level, and establishes a method for monitoring compliance with internal policies. It is likewise important that the board of directors adopts and supports strong internal controls and written policies and procedures and ensures that management effectively communicates these throughout the organization.

2. Sound capital assessment

The fundamental elements of sound capital assessment include:

- Policies and procedures designed to ensure that the bank identifies, measures, and reports all material risks;
- A process that relates capital to the level of risk;
- A process that states capital adequacy goals with respect to risk, taking account of the bank's strategic focus and business plan; and

- A process of internal controls, reviews and audit to ensure the integrity of the overall management process.

3. Comprehensive assessment of risks²⁷

All material risks faced by the bank should be addressed in the capital assessment process. SBP recognizes that not all risks can be measured precisely, a process should be developed to estimate risks. Therefore, the following risk exposures, which by no means constitute a comprehensive list of *all* risks, should be considered.

Credit risk: Banks should have methodologies that enable them to assess the credit risk involved in exposures to individual borrowers or counterparties as well as at the portfolio level. The credit review assessment of capital adequacy, at a minimum, should cover risk rating systems, portfolio analysis/aggregation, large exposures and risk concentrations.

Internal risk ratings are an important tool in monitoring credit risk. Internal risk ratings should be adequate to support the identification and measurement of risk from all credit exposures, and should be integrated into a bank's overall analysis of credit risk and capital adequacy. The ratings system should provide detailed ratings for all assets, not only for problem assets. Loan loss reserves should be included in the credit risk assessment for capital adequacy.

The analysis of credit risk should adequately identify any weaknesses at the portfolio level, including any concentrations of risk. It should also adequately take into consideration the risks involved in managing credit concentrations and other portfolio issues through such mechanisms as securitization programs and complex credit derivatives.

Operational risk:

The failure to properly manage operational risk can result in a misstatement of an institution's risk/return profile and expose the institution to significant losses. Banks should develop a framework for managing operational risk and evaluate the adequacy of capital given this framework. The framework should cover the bank's appetite and tolerance for operational risk, as specified through the policies for managing this risk, including the extent and manner in which operational risk is transferred outside the bank. It should also include policies outlining the bank's approach to identifying, assessing, monitoring and controlling/mitigating the risk.

Market risk:

Banks should have methodologies that enable them to assess and actively manage all material market risks, wherever they arise, at position, desk, business line and bank-wide level. For more sophisticated banks, their assessment of internal capital adequacy for market risk, at a minimum, should be based on both VaR modelling and stress testing, including an assessment of concentration risk and the assessment of illiquidity under stressful market scenarios, although all banks' assessments should include stress testing appropriate to their trading activity. In the bank's internal capital assessment it must demonstrate that it has enough capital to not only meet the minimum capital requirements but also to withstand a range of severe but plausible market shocks.

²⁷ For further elaboration on the subject, risk management guidelines for banks issued by SBP may be referred to.

Interest rate risk in the banking book:

The measurement process should include all material interest rate positions of the bank and consider all relevant repricing and maturity data. Such information will generally include current balance and contractual rate of interest associated with the instruments and portfolios, principal payments, interest reset dates, maturities, the rate index used for repricing, and contractual interest rate ceilings or floors for adjustable-rate items. The system should also have well-documented assumptions and techniques.

Regardless of the type and level of complexity of the measurement system used, bank management should ensure the adequacy and completeness of the system. Because the quality and reliability of the measurement system is largely dependent on the quality of the data and various assumptions used in the model, management should give particular attention to these items.

Liquidity risk:

Liquidity is crucial to the ongoing viability of any financial institution. The capital positions can have an effect on institution's ability to obtain liquidity, especially in a crisis. Each bank must have adequate systems for measuring, monitoring and controlling liquidity risk. Banks should evaluate the adequacy of capital given their own liquidity profile and the liquidity of the markets in which they operate.

Other risks: Although the 'other' risks, such as reputational and strategic risk, are not easily measurable, banks are expected to further develop techniques and follow the international best practices for managing all aspects of these risks.

4. Monitoring and reporting

The bank should establish an adequate system for monitoring and reporting risk exposures and assessing how the bank's changing risk profile affects the need for capital.

The bank's senior management or board of directors should, on a regular basis, receive reports on the bank's risk profile and capital needs. These reports should allow senior management to:

- Evaluate the level and trend of material risks and their effect on capital levels;
- Evaluate the sensitivity and reasonableness of key assumptions used in the capital assessment measurement system;
- Determine that the bank holds sufficient capital against the various risks and is in compliance with established capital adequacy goals; and
- Assess its future capital requirements based on the bank's reported risk profile and make necessary adjustments to the bank's strategic plan accordingly.

5. Internal control review

The bank's internal control structure is essential to the capital assessment process. Effective control of the capital assessment process includes an independent review and, where appropriate, the involvement of internal or external audits. The bank's board of directors has a responsibility to ensure that management establishes a system for assessing the various risks, develops a system to relate risk to the bank's capital level, and establishes a method for monitoring compliance with internal policies. The board

should regularly verify whether its system of internal controls is adequate to ensure well-ordered and prudent conduct of business.

The bank should conduct periodic reviews of its risk management process to ensure its integrity, accuracy, and reasonableness. Areas that should be reviewed include:

- Appropriateness of the bank's capital assessment process given the nature, scope and complexity of its activities;
- Identification of large exposures and risk concentrations;
- Accuracy and completeness of data inputs into the bank's assessment process;
- Reasonableness and validity of scenarios used in the assessment process; and
- Stress testing and analysis of assumptions and inputs.

Appendix - A
The Simplified Standardized Approach

This approach, rather than being another approach for determining regulatory capital, sums up at one place the simplest options for calculating risk-weighted assets for credit and operational risks.

Exposures should be risk weighted net of specific provisions. Other provisions where made part of the Tier-2 capital would remain part of the respective asset and will be risk weighted accordingly. The differentiation of risk weights for claims on sovereigns, central banks, PSEs and banks has been made on the basis of the consensus country scores (assigned to the respective country of origination of these claims) of export credit agencies (ECA) participating in the “Arrangement on Officially Supported Export Credits”, available on the website of OECD. All other claims have been assigned standardized risk weights. The risk weights for different on-balance sheet and off-balance sheet items have been enumerated hereinafter;

Risk Weights - On-Balance Sheet Items

Table-A

	Exposure Type	ECA Scores of Sovereigns mapped with SBP rating grades	Risk Weight
a.	Cash and Cash Equivalents		0%
b.	Claims on Government of Pakistan (federal or provincial governments) and SBP, denominated in PKR.		0%
c.	Foreign Currency claims on SBP arising out of statutory obligations of banks in Pakistan		0%
d.	Claims on other sovereigns and on Government of Pakistan or provincial governments or SBP denominated in currencies other than PKR	1 2 3 4,5 6	0% 20% 50% 100% 150%
e.	Claims on Bank for International Settlements, International Monetary Fund, European Central Bank, and European Community		0%
f.	Claims on Multilateral Development Banks ²⁸		100%
g.	Claims on Public Sector Entities ²⁹	1 2 3 - 5 6	20% 50% 100% 150%
h.	Claims on Banks	1 2 3 - 5 6	20% 50% 100% 150%

²⁸ Claims against following MDBs may however be assigned a risk weight of 0% : The World Bank Group comprised of the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), the Inter-American Development Bank (IADB), the European Investment Bank (EIB), the European Investment Fund (EIF), the Nordic Investment Bank (NIB), the Caribbean Development Bank (CDB), the Islamic Development Bank (IDB), and the Council of Europe Development Bank (CEDB).

²⁹ Certain PSEs maybe treated as sovereigns for lower risk weights. The names of these PSEs will be notified separately.

	Exposure Type	ECA Scores of Sovereigns mapped with SBP rating grades	Risk Weight
i.	Claims, denominated in PKR, on banks with original maturity of 3 months or less		20%
j.	Claims on Corporates (including equity exposures)		100%
k.	Claims categorized as retail portfolio		75%
l.	Claims fully secured by residential property (Residential Mortgage Finance as defined in Section 2.1)		35%
m.	<p>Past Due loans:</p> <ol style="list-style-type: none"> The unsecured portion of any claim (other than loans and claims secured against eligible residential mortgages as defined in Section 2.1) that is past due for more than 90 days and/or impaired will attract risk weight as follows: <ul style="list-style-type: none"> where specific provisions are less than 20 per cent of the outstanding amount of the past due claim ; where specific provisions are no less than 20 per cent of the outstanding amount of the past due claim. where specific provisions are more than 50 per cent of the outstanding amount of the past due claim. Loans and claims fully secured against eligible residential mortgages that are past due for more than 90 days and/or impaired Loans and claims fully secured against eligible residential mortgage that are past due by 90 days and /or impaired and specific provision held there-against is more than 20% of outstanding amount 		<p>150%</p> <p>100%</p> <p>50%</p> <p>100%</p> <p>50%</p>
n.	Unlisted equity investments (other than those deducted from capital) held in banking book		150%
o.	Investments in venture capital		150%
p.	All other assets not mentioned elsewhere		100%

Off-balance sheet items

- Off-balance sheet items under the Simplified Standardized Approach will be converted into credit exposure equivalents through the use of credit conversion factors (CCF). Counterparty risk weights for OTC derivative transactions will not be subject to any specific ceiling.
- Commitments with an original maturity up to one year and commitments with an original maturity over one year will receive a CCF of 20% and 50%, respectively. However, any commitments that are unconditionally cancelable at any time by the bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness, will receive a 0% credit conversion factor.
- A CCF of 100% will be applied to the lending of banks' securities or the posting of securities as collateral by banks, including instances where these arise out of repo-style transactions (i.e. repurchase/reverse repurchase and securities lending/securities borrowing transactions). See Section on CRM for the calculation of risk-weighted assets where the credit converted exposure is secured by eligible collateral.
- For short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralized by the underlying shipment), a 20% credit conversion factor will be applied to both issuing and confirming banks.
- Where there is an undertaking to provide a commitment on an off-balance sheet items, banks are to

apply the lower of the two applicable CCFs.

- (f) CCFs not specified herein remain as defined in our BSD circular No. 12 dated 25 August 2004. The credit equivalent amount of transactions that expose banks to counterparty credit risk must be calculated under current exposure method detailed in Section 2.4.2.1.

Credit risk mitigation (CRM)

A- Conditions for usage of Simplified Standardized Approach

Under the Simplified Standardized Approach following general, specific and minimum conditions should be observed for the techniques to be eligible for Credit Risk Mitigation.

1- General Conditions

- (a) No transaction in which CRM techniques are used should receive a higher capital requirement than an otherwise identical transaction where such techniques are not used.
- (b) The effects of CRM shall not be double counted. Therefore, no additional supervisory recognition of CRM for regulatory capital purposes will be granted on claims for which an issue-specific rating is used that already reflects that CRM. Principal-only ratings will also not be allowed within the framework of CRM.
- (c) CRM techniques are used to reduce their credit risk. These techniques give rise to risks (residual risks) which may render the overall risk reduction less effective. Where these risks are not adequately controlled, SBP may impose additional capital charges or take other supervisory actions under Pillar 2.
- (d) The use of CRM techniques reduces or transfers credit risk. However, it may simultaneously increase other risks to the bank, such as legal, operational, liquidity and market risks. Therefore, it is imperative that bank must 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.
- (e) The requirements of market discipline and transparency must also be observed for banks to obtain capital relief in respect of any CRM techniques. In this regard banks must follow the instructions issued by SBP regarding disclosures in the Annual Accounts.

2- Specific Conditions

- (a) **Legal Certainty**:- In order for banks to obtain capital relief, all documentation used in collateralized transactions and for documenting guarantees must be binding on all parties and legally enforceable in all relevant jurisdictions. 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.
- (b) **Proportional Cover**:-Where the amount collateralized or 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 the collateral or counterparty, with the remainder treated as unsecured.
- (c) **Collateralization**:-A collateralized transaction is one in which:
 - Banks have a credit exposure or potential credit exposure; and
 - that credit exposure or potential credit exposure is hedged in whole or in part by collateral posted by the counterparty or by a third party on behalf of the counterparty.
- (d) **Substitution**:- Under the simplified Standardized Approach, only the Simple Approach from the Standardized Approach will apply i.e. substitution of risk weighting of the collateral for the risk weighting of the counterparty for the collateralized portion of the exposure (generally subject to a 20% floor). Partial collateralization is recognized. Mismatches in the maturity or currency of the underlying exposure and the collateral will not be allowed.

3. Minimum Conditions

- (a) In addition to the general requirements for legal certainty mentioned earlier, the following operational requirements must be met.
- (b) The collateral must be pledged for at least the life of the exposure and it must be marked to market and

revalued with a minimum frequency of six months.

- (c) In order for collateral to provide protection, the credit quality of the counterparty and the value of the collateral must not have a material positive correlation. For example, securities issued by the counterparty — or by any related group entity — would provide little protection and so would be ineligible.
- (d) The bank must have clear and robust procedures for the timely liquidation of collateral.
- (e) Where the collateral is held by a custodian, banks must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.
- (f) Where a bank, acting as agent, arranges a repo-style transaction (i.e. repurchase/reverse repurchase and securities lending/borrowing transactions) between a customer and a third party and provides a guarantee to the customer that the third party will perform on its obligations, then the risk to the bank is the same as if the bank had entered into the transaction as principal. In such circumstances, banks will be required to calculate capital requirements as if they were themselves the principal.

B-Eligible collateral

The following collateral instruments are eligible for recognition:

- Cash (as well as certificates of deposit or comparable instruments) on deposit with the bank which is incurring the counterparty exposure
- Gold,
- Debt securities issued by Government of Pakistan (Federal or Provincial) or PSEs notified as equivalent to sovereigns,
- Debt securities issued by sovereigns rated category 4 by ECA or above, and
- Debt securities issued by PSE that are treated as sovereigns with rated category of 4 and above by ECA representing country risk.

C-Risk weights

- (a) Those portions of claims collateralized by the market value of recognized collateral receive the risk weight applicable to the collateral instrument. The risk weight on the collateralized portion will be subject to a floor of 20%. The remainder of the claim should be assigned to the risk weight appropriate to the counterparty. A capital requirement will be applied to banks on either side of the collateralized transaction: for example, both repos and reverse repos will be subject to capital requirements.
- (b) The 20% floor for the risk weight on a collateralized transaction will not be applied and a 0% risk weight can be provided where the exposure and the collateral are denominated in the same currency, and either:
 - the collateral is cash on deposit; or
 - the collateral is in the form of sovereign/PSE securities eligible for a 0% risk weight, and its market value has been discounted by 20%.

D-Guaranteed transactions

Subject to meeting following conditions, guarantees would be allowed to be taken as an eligible credit protection in calculating capital requirements.

- i) A guarantee (counter-guarantee) 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 increase the effective cost of cover as a result of deteriorating credit quality in the hedged exposure. It must also be unconditional; there should be no clause in the protection contract outside the 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) Cash funded credit linked notes issued by the bank against exposures in the banking book which fulfill the criteria for credit derivatives will be treated as cash collateralized transactions. When cash on deposit, certificates of deposit or comparable instruments issued by the lending bank are held as collateral at a third-party bank in a non-custodial arrangement, if they are openly pledged/assigned to the lending bank and if the pledge/assignment is unconditional and irrevocable, the exposure amount

covered by the collateral (after any necessary haircuts for currency risk) will receive the risk weight of the third-party bank. The rating category refers to the ECA country risk score as described earlier.

- iii) In addition to the legal certainty requirements, the following conditions must be satisfied:
 - a) On the qualifying default or non-payment of the counterparty, the bank may in a timely manner pursue the guarantor for any monies outstanding under the documentation governing the transaction. The guarantor may make one lump sum payment of all monies 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.
 - b) The guarantee is an explicitly documented obligation assumed by the guarantor.
 - c) Except as noted in the following sentence, the guarantee covers all types of payments the underlying obligor 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.
- iv) Eligible guarantors (counter-guarantors). Credit protection given by the following entities will be recognized: sovereign entities, PSEs and other entities with a risk weight of 20% or better and a lower risk weight than the counterparty.
- v) Risk weights:-The protected portion is assigned the risk weight of the protection provider. The uncovered portion of the exposure is assigned the risk weight of the underlying counterparty. A lower risk weight may be applied to a bank's exposure guaranteed by a sovereign (or central bank) where the exposure is denominated in domestic currency of that sovereign and funded in that currency.
- vi) Treatment of pools of CRM techniques:-In the case where a bank has multiple CRM covering a single exposure (e.g. a bank has both collateral and guarantee partially covering an exposure), the bank will be required to subdivide the exposure into portions covered by each type of CRM tool (e.g. portion covered by collateral, portion covered by guarantee) and the risk-weighted assets of each portion must be calculated separately. When credit protection provided by a single protection provider has differing maturities, they must be subdivided into separate protection as well.

E. Credit risk — Securitization framework

1. Scope of transactions covered under the securitization framework

- i) A traditional securitization is a structure where the cash flow from an underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk. Payments to the investors depend upon the performance of the specified underlying exposures, as opposed to being derived from an obligation of the entity originating those exposures.
- ii) The stratified/tranched structures that characterize securitizations differ from ordinary senior/subordinated debt instruments in that junior securitization tranches can absorb losses without interrupting contractual payments to more senior tranches, whereas subordination in a senior/subordinated debt structure is a matter of priority of rights to the proceeds of liquidation. Banks' exposures to securitization are referred to as "securitization exposures".

2. Permissible role of banks

- i) A bank operating under the Simplified Standardized Approach can only assume the role of an investing bank in a traditional securitization. An investing bank is an institution, other than the originator or the servicer that assumes the economic risk of a securitization exposure.
- ii) A bank is considered to be an originator if it originates directly or indirectly credit exposures included in the securitization. A servicer bank is one that manages the underlying credit exposures of a securitization on a day-to-day basis in terms of collection of principal and interest, which is then forwarded to investors in securitization exposures. A bank under the Simplified Standardized Approach should not offer credit enhancement, liquidity facilities or other financial support to a

securitization.

3. Treatment of Securitization Exposures

- i) Banks using the simplified Standardized Approach to credit risk for the type of underlying exposure(s) securitized are permitted to use a simplified version of the Standardized Approach under the securitization framework.
- ii) The standard risk weight for securitization exposures for an investing bank will be 100%. For first loss positions acquired, deduction from capital will be required. The deduction will be taken 50% from Tier 1 and 50% from Tier 2 capital.

F. Operational Risk

The Simplified Standardized Approach for operational risk is the Basic Indicator Approach under which banks must hold capital equal to a fixed percentage (15%) of average annual gross income, where positive, over the previous three years.

Gross income is defined as net interest income plus net non-interest income. This measure should:

- i) be gross of any provisions (e.g. for unpaid interest);
- ii) be gross of operating expenses, including fees paid to outsourcing service providers^{*};
- iii) exclude realized profits/losses from the sale of securities in the banking book^{**}; and
- iv) exclude extraordinary or irregular items as well as income derived from insurance.

^{*} *In contrast to fees paid for services that are outsourced, fees received by banks that provide out-sourcing services shall be included in the definition of gross income.*

^{**} *Realized profit / losses from securities classified as "held to maturity" which typically constitute items of the banking book, are also excluded from the definition of gross-income*