

RESERVE BANK OF ZIMBABWE



BANK LICENSING, SUPERVISION & SURVEILLANCE

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**Technical Guidance on the Implementation of the Revised Capital
Adequacy Framework in Zimbabwe**

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ABBREVIATIONS

ABCP	Asset-backed commercial paper
ADC	Acquisition, development and construction
AMA	Advanced measurement approaches
ASA	Alternative standardised approach
CCF	Credit conversion factor
CCR	Counterparty credit risk
CDR	Cumulative default rate
CEM	Current exposure method
CF	Commodities finance
CMV	Current market value
CRM	Credit risk mitigation
DvP	Delivery-versus-payment
EAD	Exposure at default
EC	Economic Capital
ECA	Export credit agency
ECAI	External credit assessment institution
EL	Expected loss
EPE	Expected positive exposure
FMI	Future margin income
HVCRE	High-volatility commercial real estate
IAA	Internal assessment approach
IMM	Internal model method
IPRE	Income-producing real estate
I/O	Interest-only strips
IRB	Internal ratings-based
LGD	Loss given default
M	Effective maturity
MDB	Multilateral development bank
NIF	Note issuance facility
OF	Object finance
PD	Probability of default

PF	Project finance
PSE	Public sector entity
PvP	Payment-versus-payment
QRRE	Qualifying revolving retail exposures
RBA	Ratings-based approach
RC	Regulatory Capital
SRS	Supervisory Rating Scale
RUF	Revolving underwriting facility
SF	Supervisory formula
SFT	Securities financing transaction
SL	Specialised lending
SM	Standard method
SME	Small- and medium-sized entity
SPE	Special purpose entity
UCITS	Undertakings for collective investments in transferable securities
UL	Unexpected loss

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1. INTRODUCTION

- 1.1 In line with initiatives designed to ensure convergence of supervisory standards with international best practice, the Reserve Bank initially issued guidelines to the market on the measurement of capital adequacy in July 1995.
- 1.2 The guidelines, which were based on the Basel Committee's 1988 Capital Accord, provided for the measurement of capital adequacy through risk based capital ratios. This approach related a bank's capital to the credit risk in its portfolio.
- 1.3 The introduction of the guidelines marked the adoption of the Basel Standards on the measurement of capital adequacy. All banks in Zimbabwe were expected to be in full compliance with the minimum capital adequacy requirements by June 30, 1999.
- 1.4 Subsequently, in 2004, the Basel Committee on Banking Supervision made valuable improvements and updates to the 1988 recommendations on supervisory regulations governing the capital adequacy of banking institutions.
- 1.5 The revised framework, which is contained in a document entitled "**International convergence of Capital Measurement and Capital Standards: A Revised Framework**" sets out the details.
- 1.6 The fundamental objective of the Revised Framework, popularly known as Basel II, is to promote the adoption of stronger risk management practices by the banking industry, and to develop more risk-sensitive capital requirements.
- 1.7 The Committee retained key elements of the 1988 capital adequacy framework, including the definition of eligible capital, the general requirement for banks to hold total capital in relation to their risk-weighted assets and the basic structure of the 1996 Market Risk Amendment regarding the treatment of market risk.
- 1.8 In summary, the Basel II framework consists of three mutually reinforcing pillars. Under Pillar 1, the framework allows for a continuum of approaches for computing regulatory capital in respect of credit, market and operational risks. The measurement approaches range from simple to advanced methods. The simple methods are standardised methods which are prescribed by supervisors whereas the advanced approaches are based on the use of a bank's own internal models.
- 1.9 To this extend, the Revised Framework narrows the gap between regulatory capital as set by regulatory authorities and economic capital, as measured by the bank's internal models.

- 1.10** The Revised Framework allows for capital charges that reward sound risk management and relies on continuous review of a bank's risk management processes by the regulator (Pillar II). The Revised Framework also encourages more public disclosure (Pillar III) by banking institutions in respect of published reports covering their financial structure, performance and risk profiles.
- 1.11** This technical guideline outlines the methodology and requirements for implementing Basel II in Zimbabwe. It is divided into four parts. The first part, deals with definition of capital, while the second outlines the calculation of the minimum capital requirements (Pillar I) for credit risk, operational risk, and market risk. The third and fourth parts cover supervisory review (Pillar II) and market discipline (Pillar III), respectively.

2. SCOPE OF APPLICATION

- 2.1** The scope of application of this Framework will include, on a fully consolidated basis, all banking and other relevant financial activities at every tier within a banking group, in line with Guideline No.02-2007/BSD: Consolidated Supervision Policy Framework.

3. CAPITAL REQUIREMENTS FOR BANKING INSTITUTIONS

3.1 Introduction

- 3.1.1 Reserve Bank's approach to the assessment of a banking institution's capital adequacy is based on the risk-based capital adequacy framework set out in the Basel Committee on Banking Supervision's publication entitled, *International Convergence of Capital Measurement and Capital Standards: A Revised Framework*.
- 3.1.2 Under the framework, a banking institution's capital position is measured through a risk-based capital ratio calculated by dividing its capital base by total risk-weighted assets, as follows:

$$CAR = \frac{\text{NetCapitalbase}}{\text{Credit RWA} + \text{Operational Risk Equivalent Assets} + \text{Market Risk Equivalent Assets}}$$

Where:

- CAR refers to Capital Adequacy Ratio.
- Net capital base refers to the sum of qualifying components of capital net of required deductions.
- Total risk-weighted assets are the sum of credit risk-weighted assets, operational risk assets, and market risk assets.

3.2 Definition of Capital Elements

- 3.2.1 The following definitions are used throughout this guideline:
- a. **Net capital base** or **total capital** means the net capital of a banking institution arrived at by deducting from its gross capital any:
 - i). investments in or lending of a capital nature to subsidiaries engaged in banking and financial activities which are not consolidated;
 - ii). encumbered assets, that is, those funds acquired by using the bank's capital funds which have subsequently been pledged as collateral for borrowings or are encumbered by any caveats rendering them unavailable to meet losses arising from the institution's operations;
 - b. **conversion factor** means a factor fixed by the Reserve Bank under its prudential guidelines issued to banking institutions from time to time for the purpose of bringing any class of off-balance sheet asset to its on-balance sheet equivalent;
 - c. **core capital** (or tier 1 capital) means capital representing a permanent commitment of funds by the shareholders of the banking institution (net of any loans and advances given to

- an insider) which is available to meet losses incurred without imposing a fixed unavoidable charge on the institution's earnings, and includes such of the following elements as are available to the institution after making any required deductions:
- i). issued and fully paid up ordinary shares or common stock;
 - ii). paid up non-cumulative irredeemable preference shares;
 - iii). reserves consisting of:
 - a) non-repayable share premiums;
 - b) disclosed reserves created by a charge to net income in the financial year immediately preceding the current one;
 - c) published retained earnings for the current year, including interim earnings, where these have been verified by external auditors;
 - iv). minority interests in subsidiaries arising on consolidation;
- d. **supplementary capital** (or "tier 2 capital") means capital other than core capital which imparts strength to a banking institution, and includes such of the following elements as are available to the institution:
- i). the current financial year's unpublished profits where provisions for taxation, dividends and bad debts have been made;
 - ii). the full extent of fixed assets revaluation reserves where they are carried through to the balance sheet;
 - iii). revaluation reserves arising from the holding of equity securities at historic cost and not at market values to the extent of 55% of the reserve;
 - iv). general bad debt provisions to the extent of 1,25% of total risk weighted assets;
 - v). the full extent of any subordinated term debt (loan capital) whose remaining term to maturity is more than five years, and so much of any subordinated term debt whose remaining term to maturity is five years or less as is calculated by amortising or discounting such debt by a cumulative factor of 20% per year of the remaining term to maturity, provided that this element will not be included to the extent that it exceeds 50% of the core capital of the banking institution;
 - vi). hybrid (debt/equity) capital instruments such as cumulative preference shares which are unsecured and fully paid up and are available to meet losses;
 - vii). equity funded through the capitalisation of revaluation reserves;
 - viii). the full extent of any minority interests in cumulative redeemable preference shares;

- ix). such hidden reserves as the Reserve Bank may agree to be included in supplementary capital;
- e. **core risk-based capital ratio** means the ratio of core capital to total risk-based assets;
- f. **gross capital** means the sum of the core capital and supplementary capital of a banking institution;
- g. **leverage capital ratio** means the ratio of core capital to total assets;
- h. **required deductions**, in relation to core capital, means the following deductions required to be made from core capital where they arise—
 - i). the current financial year's unpublished losses;
 - ii). goodwill;
 - iii). equity funded through the capitalisation of revaluation reserves;
- i. **risk weight** means a risk weight assigned by the Reserve Bank to any class of asset under the Reserve Bank's prudential guidelines issued to banking institutions from time to time;
- j. **Total risk-based capital ratio** means the ratio of total capital to total risk-based assets.

3.3 Risk weights

- 3.3.1 The focus of the risk weights assigned by the Reserve Bank is to match the risk of losses posed by each exposure in a bank's portfolio to an appropriate level of capital.
- 3.3.2 In applying a risk weight to off-balance sheet items, the conversion factors (based on the estimated size and likely occurrence of the credit exposure and relative degree of credit risk) fixed by the Reserve Bank in relation to such items are used to bring the off balance sheet assets to their on-balance sheet equivalent.
- 3.3.3 After the off-balance sheet amount is converted to its on-balance sheet equivalent, the equivalent on-balance sheet risk weights are then applied to the assets.

3.4 Minimum ratios, Limits and Restrictions

- 3.4.1 The core capital of a banking institution shall comprise not less than 50% of the capital base of the institution.
- 3.4.2 The total of Tier 2 (supplementary) elements will be limited to a maximum of 100% of the total of Tier 1 elements.
- 3.4.3 The minimum leverage capital ratio for a banking institution shall be 6%.
- 3.4.4 The minimum core risk-based capital ratio for a banking institution shall be 5%.

3.4.5 The minimum total risk-based capital ratio for a banking institution shall be 10%.

A) ALLOCATING CAPITAL FOR CREDIT RISK

3.5 Introduction

- 3.5.1 The Reserve Bank recognises both the **Standardised Approach** and the **Internal Ratings Based approach** (IRB) for assessing minimum regulatory capital for credit risk.
- 3.5.2 The following paragraphs provide an outline of these approaches adopted from Basel II, incorporating necessary adjustments in line with local environment.

3.6 Modified Standardised Approach for Credit Risk

- 3.6.1 The Basel II framework recommends a Standardised Approach based on ratings assigned by eligible external credit rating agencies and export credit rating agencies to determine risk weights for a bank's counterparties in order to set regulatory capital for credit risk.
- 3.6.2 However, the external ratings market has not yet expanded to cover an acceptable volume of the credit market in Zimbabwe. As such the majority of bank borrowers from various industries are not rated.
- 3.6.3 In this regard, the Reserve Bank has adopted a modified version of the Standardised Approach for the determination of regulatory capital for credit risk, as outlined hereunder.

3.7 Credit Risk-Weighted Assets

- 3.7.1 A banking institution's credit risk-weighted assets equal the sum of the risk-weighted amount of each on- and off-balance sheet assets it holds.
- 3.7.2 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.
- 3.7.3 In line with Basel II provisions, the Modified Standardised Approach recognises the treatment of credit risk mitigation techniques through two methodologies, i.e. the Simple Approach and the Comprehensive Approach, as explained in the subsequent sections.

3.8 Classification of Exposures

- 3.8.1 In terms of the Modified Standardised Approach, a banking institution should classify its credit exposures into the following asset classes, for risk weighting purposes:
- a) Domestic Sovereigns;
 - b) Foreign Sovereigns;

- c) Public Sector entities;
- d) Multilateral Development Banks;
- e) Banks;
- f) Securities firms;
- g) Corporates;
- h) Regulatory Retail Exposures;
- i) Residential Mortgages;
- j) Commercial Real Estate;
- k) Securitisation Exposures;
- l) Past due exposures; and
- m) Other exposures.

3.8.2 The standardised portfolios listed above should be mutually exclusive.

3.9 Supervisory Loan Classification System

3.9.1 In order to operationalise the Modified Standardised Approach, in the absence of External Credit Rating Agencies, the Reserve Bank has expanded the supervisory loan classification system from five classes (i.e. pass, special mention, substandard, doubtful and loss) to a new Supervisory Rating Scale (SRS) with ten main classes, along with several subclasses.

Table 1 Supervisory Loan Classification System

SRS Numerical Classification		Descriptive Classification	Risk level	Five Tier Loan Classification
Rating Classification	Sub-rating			
1	-	Prime Grade	Insignificant	Pass
2	2a	Strong	Modest	
	2b			
	2c			
3	3a	Satisfactory	Average	
	3b			
	3c			
4	4a	Moderate	Acceptable	Special Mention
	4b			

SRS Numerical Classification		Descriptive Classification	Risk level	Five Tier Loan Classification
Rating Classification	Sub-rating			
	4c			
5	5a	Fair	Acceptable with care	
	5b			
	5c			
6	6a	Speculative	Management Attention	
	6b			
	6c			
7	7a	Highly Speculative	Special Attention	
	7b			
	7c			
8		Substandard	Vulnerable	Substandard
9		Doubtful	High Default	Doubtful
10		Loss	Bankrupt	Loss

- 3.9.2 The detailed description of each grade is provided in Appendix 1.
- 3.9.3 Of the ten (10) supervisory rating grades, only classes 2 to 9 may have modifiers (i.e. 2a, 2b, 2c, 3a, 3b, 3c etc), making the new rating scale more granular.
- 3.9.4 Banking institutions that require more granularities in the non-investment grades 8 and 9 may also use modifiers such as 8a, 8b, and 8c. However, rating classes 1 and 10 shall not have any modifiers under any circumstances.
- 3.9.5 The factors that should be considered in arriving at the ratings should include quantitative and qualitative factors some of which measure:
- a) the likelihood of a borrower to meet financial commitments such as interest and repayment of principal;
 - b) nature of the obligation, guarantee or collateral; and

- c) protection afforded by and relative position of the obligation in the event of bankruptcy, reorganisation, or any other arrangement.

3.9.6 Banking institutions must document the criteria for mapping their internal ratings to the SRS.

3.10 Mapping SRS to Rating Agency equivalent

3.10.1 The following table shows how the new rating scale may be mapped to common rating agency scales:

Table 2 Mapping of the new Reserve Bank rating scale¹

No	Reserve Bank Scale	Standard & Poors/Fitch/GCR	Moody's
1	1	AAA	Aaa
2	2a	AA+	Aa1
3	2b	AA	Aa2
4	2c	AA-	Aa3
5	3a	A+	A1
6	3b	A	A2
7	3c	A-	A3
8	4a	BBB+	Baa1
9	4b	BBB	Baa2
10	4c	BBB-	Baa3
11	5a	BB+	Ba1
12	5b	BB	Ba2
13	5c	BB-	Ba3
14	6a	B+	B1
15	6b	B	B2
16	6c	B-	B3
17	7a	CCC+	Caa1
18	7b	CCC	Caa2
19	7c	CCC-	Caa3
20	8	CC	Ca
21	9	C	C
22	10	D	D

3.10.2 Table 2 above is provided as a guidance to banking institutions that have internal rating systems in place or those that may develop their own rating systems in future, on how to map internal rating scales, via their rating agency equivalent, to the regulatory scale.

¹ All ratings below 5- (in grey cells) are sub-investment.

3.11 Credit ratings data requirements

- 3.11.1 A banking institution should validate the ratings at least once a year to assess the integrity of the internal ratings.
- 3.11.2 The rating philosophy of the rating system should be either, Through-the-Cycle (TTC) or hybrid, i.e. both Point-in-Time (PIT) and TTC. Where a bank's rating system is found to be PIT, the bank may be required to set higher capital levels for certain credit exposures. TTC requirements for ratings used for setting capital levels are consistent with the requirements in the corresponding section under the IRB approach.
- 3.11.3 In order to allow for the backtesting of rating systems in use, all banking institutions should ensure that they store ratings information for current and historical ratings that were assigned to all borrowers in the past. In that respect all the quantitative and qualitative factors used to arrive at all ratings should also be stored.
- 3.11.4 As minimum guidance, for every counterparty/borrower, banking institutions must store the following ratings information:
- a) borrower name;
 - b) account number or unique ID;
 - c) rating at the start of the year;
 - d) rating at the end of the year;
 - e) worst rating during the year;
 - f) date at which each rating revision is done;
 - g) total credit limit and utilisation at the end of every month;
 - h) monthly interest rate on the drawn amount;
 - i) industrial sector of borrower;
 - j) business unit responsible for relationship;
 - k) default date if applicable;
 - l) external rating if available; and
 - m) all data used to arrive at each internal rating i.e. values of all factors used to arrive at the rating.
- 3.11.5 If a new rating is assigned to counterparty, the old rating and all the associated information should be stored.

3.11.6 The above information should be available for all the years the relationship with the counterparty is in place.

3.11.7 Similarly for defaulted obligors, a banking institution must store the following additional information:

- a) credit rating before default;
- b) facility type;
- c) date of resolution;
- d) collateral recovery data; and
- e) guarantee recovery data.

3.12 Regulatory Ratings Validations

3.12.1 A banking institution must perform validation tests on ratings and rating systems, at least annually, to assess their discriminatory and calibration powers.

3.12.2 A banking institution should ensure that the rating systems are also validated to review the performance of all factors used in the models. Rating models that fail these tests will need to be enhanced.

3.12.3 A banking institution must have policies and procedures that cover the use of rating models, their implementation, review and internal validations.

3.13 Provisioning Requirements

3.13.1 A banking institution must maintain provisions in respect of outstanding balances on loans and advances as outlined hereunder:

Table 3 Level of provisions under the SRS

Grade	Provisioning Percentage (of Exposure)
1 to 3	1%
4 to 5	5%
6 to 7	10%
8	30%
9	50%
10	100%

3.14 Risk Weighting Exposures

Claims on Domestic Sovereigns ...

3.14.1 The risk weight applicable to government exposures will also apply to the exposures to the Reserve Bank and government guaranteed exposures and securities.

3.14.2 The government and the central bank exposures will be risk weighted as follows:

Table 4 Risk Weights for Domestic Sovereigns

Sovereign	Direct exposures	Guaranteed exposures
Government	0%	0%
Central Bank	0%	0%

3.14.3 The risk weight of 0% for government guaranteed exposures apply only to the extent that the exposures are classified as performing. Where the exposures become non-performing, they attract risk weights applicable to NPAs.

Claims on Foreign Sovereigns ...

3.14.4 Exposures on foreign sovereigns and their central banks attract risk weights corresponding to the rating assigned by a rating agency and/or export credit agency as follows:

Table 5 Risk Weights for Foreign Sovereigns

Supervisory Rating Scale	1 to 2	3	4	5 to 6	Below 7
Credit Assessment of ECRAs	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
Export Credit Agencies	1	2	3	4 – 6	7
Risk Weights	0%	20%	50%	100%	150%

3.14.5 Exposures denominated in domestic currency of a foreign sovereign funded in the same currency of that sovereign will, however, attract a risk weight of zero percent.

Claims on public sector entities (PSEs) ...

3.14.6 Claims on domestic public sector entities will be risk weighted as corporates.

Claims on MDBs, BIS and IMF ...

- 3.14.7 A zero per cent (0%) risk weight will be applied to the exposures on the Bank for International Settlements, the International Monetary Fund and other highly rated Multilateral Development Banks (MDBs) such as African Export-Import Bank, World Bank, and African Development Bank, among others.
- 3.14.8 Exposures guaranteed by the MDBs will also attract a 0% risk weight.

Claims on Banks...

- 3.14.9 The risk weight relating to claims on banks should be based on external credit assessments. A preferential risk weight may be applied to claims with an original maturity of three months or less, subject to a floor of 20%. This treatment will be available to all bank claims, but not to banks allocated a credit rating attracting a risk weighted at or above 150%.

Table 6 Risk Weights for Claims on Banks

Supervisory Rating Scale	1 to 2	3	4	5 to 6	Below 7
Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
Risk weight	20%	50%	50%	100%	150%
Risk weight for short-term claims	20%	20%	20%	50%	150%

Claims on Securities firms...

- 3.14.10 Claims on securities firms shall be treated as claims on corporates.

Claims on corporates...

- 3.14.11 Claims on corporates shall be risk weighted as per the ratings assigned by the banks internal rating system. The table below indicates the risk weight applicable to claims on corporates.

Table 7 Risk Weights for Claims on Corporates

Supervisory Rating Scale	1 to 2	3	4 to 5	6 to 7	8 and Below
Credit Assessment	AAA to AA-	A+ to A-	BBB+ to BB-	B+ to CCC-	Below CCC-
Risk weight	20%	50%	100%	120%	150%

Claims included in the regulatory retail portfolios...

3.14.12 Regulatory retail exposures should be risk-weighted at 75%, except as provided for past due loans. To be included in the regulatory retail portfolio, claims must meet the following four criteria:

- a) **Orientation criterion:** the exposure is to an individual person or persons or to a small business;
- b) **Product criterion:** the exposure takes the form of any of the following: revolving credits and lines of credit (including credit cards and overdrafts), personal term loans and leases (e.g. installment loans, car loans and leases, student and educational loans, personal finance) and small business facilities and commitments. Securities (such as bonds and equities), whether listed or not, are specifically excluded from this category. Mortgage loans are excluded to the extent that they qualify for treatment as claims secured by residential property.
- c) **Granularity criterion:** the regulatory retail portfolio should be sufficiently diversified to a degree that reduces the risks in the portfolio, warranting the 75% risk weight. In that respect, no aggregate exposure to one counterpart can exceed 0.2% of the overall regulatory retail portfolio and past due loans should be excluded for purposes of assessing this granularity criteria; and.
- d) **Low value of individual exposures:** The maximum aggregated retail exposure to one counterpart cannot exceed an absolute threshold of **USD100,000.00**

Claims secured by residential property ...

3.14.13 Lending fully secured by mortgages on residential property that is or will be occupied by the borrower, or that is rented, shall be risk weighted at 35%. Investment in asset-backed securities, which are backed by mortgages of residential property of the above nature, shall also be risk weighted at 35%.

3.14.14 The 35% risk weight applies to residential mortgages where a margin of additional security of at least 25% exists over the amount of the loan based on strict valuation rules.

3.14.15 All other claims secured by residential property would attract a higher risk weight of 75%.

Claims secured by commercial real estate ...

3.14.16 Claims secured by mortgages on commercial real estate will attract a risk weight of 100%.

Securitisation Exposures...

3.14.17 The guidelines on the treatment of securitisation exposures are covered in Guideline No. 01-2007/BSD: Special Purpose Vehicles, Securitisation and Structured Finance.

Non-performing assets (NPAs)...

3.14.18 The unsecured portion of NPA (other than a qualifying residential mortgage loan), net of specific provisions (including partial write-offs), will be risk-weighted as follows:

Table 8: Risk Weights for Non-Performing Assets

Level of Provisions	Risk Weight
Specific provisions are less than 20% of the outstanding amount of the NPA	150%
Specific provisions are between 20% and 50% of the outstanding amount of the NPA	100%
Specific provisions are more than 50% of the outstanding amount of the NPA	50%

3.14.19 In terms of the prudential norms, asset classification is identified borrower-wise and not facility-wise. Accordingly, for the purpose of computing the level of specific provisions in NPAs for deciding the risk-weighting, all funded exposures of a single counterparty should be reckoned.

3.14.20 For the purpose of defining the secured portion of the NPA, eligible collateral and guarantees will be the same as recognised for credit risk mitigation purposes.

3.14.21 In addition to the above, where a NPA is fully secured by the following forms of collateral that are not recognised for credit risk mitigation purposes, either independently or along with other eligible collateral, a 100% risk weight may apply, net of specific provisions, when provisions reach 15% of the outstanding amount:

a) land and building which are valued by an expert valuer and where the valuation is not more

than three years old; and

- b) plant and machinery in good working condition at a value not higher than the depreciated value as reflected in the audited balance sheet of the borrower.

3.14.22 The above types of collateral will be recognized only where the bank is having clear title to realize the sale proceeds thereof and appropriate the same towards the amounts due to the bank. The bank's title to the collateral should also be well documented. These forms of collateral are not recognised anywhere else under the standardised approach.

3.14.23 In the case of claims secured by residential property, which are NPA they will be risk weighted at 100% net of specific provisions. If the specific provisions in such loans are at least 20% of their outstanding amount, the risk weight applicable to the loan net of specific provisions will be 75%.

3.14.24 The Reserve Bank may, request a bank to apply a 150% or higher risk weight reflecting the higher risks associated with any exposures that may be identified as high risk exposures.

Other Exposures ...

Securitisation exposures...

3.14.25 All other assets not falling into any of the above categories will attract a uniform risk weight of 100%. Investments in equity or regulatory capital instruments issued by banks or securities firms will be risk weighted at 100%, unless deducted from capital according to relevant regulatory requirements.

Off-Balance Sheet Items...

3.14.26 The credit risk exposure attached to off-balance sheet items has to be first calculated by multiplying the face value of each of the off-balance sheet items by relevant credit conversion factors (CCF). This will then have to be again multiplied by the weights attributable to the relevant counter-party as specified above.

3.14.27 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 cancellable 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% CCF.

- 3.14.28 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).
- 3.14.29 For short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralised by the underlying shipment), a 20% CCF will be applied to both issuing and confirming banks.
- 3.14.30 Where there is an undertaking to provide a commitment on an off-balance sheet item, banks are to apply the lower of the two applicable CCFs.
- 3.14.31 CCFs not specified in the above paragraphs remain as defined in the 1988 Accord, as outlined below.

Table 9: Credit Conversion Factors

	Instruments	Credit Conversion Factor
1.	Direct credit substitutes e.g. general guarantees of indebtedness (including standby L/Cs serving as financial guarantees for loans and securities) and acceptances (including endorsements with the character of acceptance).	100%
2.	Certain transaction-related contingent items (e.g. performance bonds, bid bonds, warranties and standby L/Cs related to particular transactions).	50%
3.	Short-term self-liquidating trade-related contingencies (such as documentary credits collateralised by the underlying shipments) for both issuing bank and confirming bank.	20%
4.	Sale and repurchase agreement and asset sales with recourse, where the credit risk remains with the bank.	100%
5.	Forward asset purchases, forward deposits and partly paid shares and securities, which represent commitments with certain drawdown.	100%
6.	Note issuance facilities and revolving underwriting facilities.	50%
7.	Other commitments (e.g. formal standby facilities and credit lines) with an original maturity of over one year.	50%
8.	Similar commitments with an original maturity up to one year	20%
9.	Commitments that are unconditionally cancellable at any time by the bank without prior notice	0%
10.	Take-out Finance in the books of taking-over institution	
	a. Unconditional take-out finance	100%
	b. Conditional take-out finance	50%

3.14.32 In regard to off-balance sheet items, the following transactions with non-bank counterparties will be treated as claims on banks:

- a) guarantees issued by banks against the counter guarantees of other banks; and
- b) rediscounting of documentary bills accepted by banks. Bills discounted by banks which have been accepted by another bank will be treated as a funded claim on a bank.

3.14.33 In all the above cases banks should be fully satisfied that the risk exposure is in fact on the other bank.

3.15 External Credit Assessments

3.15.1 A banking institution with counterparties that are rated by an approved external rating agency may use the corresponding ratings for purposes of setting capital. The use of external ratings is subject to the conditions spelt out in the following paragraphs.

The recognition process...

3.15.2 The Reserve Bank is responsible for approving the use of ratings from specific rating agencies in accordance with the requirements of **Guideline No.04-2004 /BSD Accreditation of Credit Rating Agencies**.

Implementation considerations...

3.15.3 For externally rated counterparties, a bank must use ratings from a specific ECAI, consistently for each type of claim, for both risk weighting and risk management purposes.

3.15.4 A banking institution must disclose the ECAI that it uses for the risk weighting of assets by type of claims, the risk weights associated with the particular rating grades as determined by the SRS as well as the aggregated risk-weighted assets for each risk weight based on the assessments of each eligible ECAI.

Multiple assessments...

3.15.5 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.

3.15.6 If there are two assessments by ECAIs chosen by a bank which map into different risk weights, the higher risk weight will be applied.

3.15.7 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.

Issuer versus issues assessment...

3.15.8 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.

a) 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 unassessed claim will receive the risk weight for unrated claims; and

- b) 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.

3.15.9 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.

3.15.10 In order to avoid any double counting of credit enhancement factors, no supervisory recognition of credit risk mitigation techniques will be taken into account if the credit enhancement is already reflected in the issue specific rating.

Domestic currency and foreign currency assessments...

3.15.11 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.

Short-term/long-term assessments...

3.15.12 For risk-weighting purposes, short-term assessments are deemed to be issue specific. They can only be used to derive risk weights for claims arising from the rated facility.

3.15.13 In no event can a short-term rating be used to support a risk weight for an unrated long-term claim. Short-term assessments may only be used for short-term claims against banks and corporates. The table below provides a framework for banks' exposures to specific short-term facilities, such as a particular issuance of commercial paper:

Table 10: Risk weights for short-term ratings

Credit assessment	A-1/P-1	A-2/P-2	A-3/P-3	Others
Risk weight	20%	50%	100%	150%

- 3.15.14 If a short-term rated facility attracts a 50% risk-weight, unrated short-term claims cannot attract a risk weight lower than 100%. If an issuer has a short-term facility with an assessment that warrants a risk weight of 150%, all unrated claims, whether long-term or short-term, should also receive a 150% risk weight, unless the bank uses recognised credit risk mitigation techniques for such claims.
- 3.15.15 Since the Reserve Bank has opted to implement option 2 under the standardised approach to short term interbank claims on banks, the interaction with specific short-term assessments is expected to be the following:
- a) the general preferential treatment for short-term claims, applies to all claims on banks of up to three months original maturity when there is no specific short-term claim assessment;
 - b) when there is a short-term assessment and such an assessment maps into a risk weight that is more favourable (i.e. lower) or identical to that derived from the general preferential treatment, the short-term assessment should be used for the specific claim only. Other short-term claims would benefit from the general preferential treatment; and
 - c) when a specific short-term assessment for a short term claim on a bank maps into a less favourable (higher) risk weight, the general short-term preferential treatment for interbank claims cannot be used. All unrated short-term claims should receive the same risk weighting as that implied by the specific short-term assessment.
- 3.15.16 When a short-term assessment is to be used, the institution making the assessment needs to meet all of the eligibility criteria for recognising ECAIs as presented in Chapter 4 of Guideline No. 02-2007/BSD: Accreditation of Credit rating Agencies in terms of its short-term assessment.

Level of application of the assessment...

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

Unsolicited ratings...

- 3.15.18 As a general rule, a banking institution should use solicited ratings from eligible ECAIs. A banking institution may use unsolicited ratings in the same way as solicited ratings, subject to prior approval by the Reserve Bank.

3.16 Credit Risk Mitigation under the Modified Standardised Approach

- 3.16.1 Where a banking institution utilises credit risk mitigation techniques, such as cash or securities-backed exposures, guarantees etc, which meet the requirements for legal certainty as described in paragraph 3.16.4 below, these will be recognised for regulatory capital purposes under the Revised Capital Accord.
- 3.16.2 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, banking institutions must employ robust procedures and processes to control these risks e.g. controlling of roll-off risks and the management of concentration risk arising from the bank's use of CRM techniques and its interaction with the bank's overall credit risk profile.
- 3.16.3 Where these risks are not adequately controlled, the Reserve Bank may impose additional capital charges or take appropriate supervisory action in line with the Supervisory Review Process (Pillar II).

Legal certainty...

- 3.16.4 The following are the minimum legal documentation requirements with respect to CRM techniques:
- a) all documentation used in collateralised transactions and for documenting on-balance sheet netting, guarantees and credit derivatives must be binding on all parties and legally enforceable in all relevant jurisdictions; and
 - b) 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.

Collateralised transactions...

- 3.16.5 The Reserve Bank will recognise a collateralised transaction as one in which:

- a) A banking institution has a credit exposure or potential credit exposure; and
 - b) that credit exposure or potential credit exposure is hedged in whole or in part by collateral posted by a counterparty or by a third party on behalf of the counterparty.
- 3.16.6 Where a banking institution take eligible financial collateral (e.g. cash or securities, more specifically defined in paragraphs 3.16.33 and 3.16.34 below), it is allowed to reduce the credit exposure to a counterparty when calculating capital requirements to take account of the risk mitigating effect of the collateral.

Overall framework and minimum conditions...

- 3.16.7 A banking institution may opt for either:
- a) the simple approach, which substitutes the risk weighting of the collateral for the risk weighting of the counterparty for the collateralised portion of the exposure (generally subject to a 20% floor); or
 - b) the comprehensive approach, which allows offsetting of collateral against exposures, thereby effectively reducing the exposure amount by the value ascribed to the collateral.
- 3.16.8 A banking institution may operate under either, but not both, approaches in the banking book, but only under the comprehensive approach in the trading book. Partial collateralisation is recognised in both approaches. Mismatches in the maturity of the underlying exposure and the collateral will only be allowed under the comprehensive approach.
- 3.16.9 However, before capital relief will be granted in respect of any form of collateral, the standards set out below in paragraphs 3.16.10 to 3.16.14 must be met under either approach.
- 3.16.10 In addition to paragraph 3.16.4 above, the legal mechanism by which collateral is pledged or transferred must ensure that the banking institution has the right to liquidate or take legal possession of it, in a timely manner, in the event of 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).
- 3.16.11 Further, a banking institution must take the steps necessary to fulfill those requirements under the law applicable to the banking institution'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 title transfer collateral.

- 3.16.12 The credit quality of the counterparty and the value of the collateral must not have a material positive correlation.
- 3.16.13 A banking institution establish adequate procedures for the timely liquidation of collateral to ensure that any legal conditions required for declaring the default of the counterparty and liquidating the collateral are observed, and that collateral can be liquidated promptly.
- 3.16.14 Where the collateral is held by a custodian, a bank must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.
- 3.16.15 Where a banking institution, 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.

The simple approach...

- 3.16.16 In the simple approach the risk weighting of the collateral instrument collateralising or partially collateralising the exposure is substituted for the risk weighting of the counterparty. Details of this framework are provided in paragraphs 3.16.74 to 3.16.77.

The comprehensive approach...

- 3.16.17 In the comprehensive approach, when taking collateral, banking institutions should calculate its adjusted exposure to a counterparty for capital adequacy purposes in order to take account of the effects of that collateral.
- 3.16.18 A banking institution is required to adjust both the amount of the exposure to the counterparty and the value of any collateral, using haircuts, to take account of possible future fluctuations in the value of either, occasioned by market movements. 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 (before adjustment) and for the collateral it will be lower.

- 3.16.19 Additionally where the exposure and collateral are held in different currencies an additional downwards adjustment must be made to the volatility adjusted collateral amount to take account of possible future fluctuations in exchange rates.
- 3.16.20 Where the volatility-adjusted exposure amount is greater than the volatility-adjusted collateral amount (including any further adjustment for foreign exchange risk), banks 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 set out in paragraphs 3.16.35 to 3.16.38.
- 3.16.21 There are two ways of calculating the haircuts:
- a) standard supervisory haircuts, using parameters set by the supervisory authorities; and
 - b) own-estimate haircuts, using banks' own internal estimates of market price volatility.
- 3.16.22 A bank should obtain prior Reserve Bank approval to use own-estimate haircuts. The approval will be granted when a bank meets specific qualitative and quantitative criteria outlined in paragraphs 3.16.45 to 3.16.54).
- 3.16.23 Where a bank is authorised to use own-estimate haircuts, it must do so for the full range of instrument types for which it would be eligible to use own-estimates, the exception being immaterial portfolios where they may use the standard supervisory haircuts.
- 3.16.24 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.
- 3.16.25 For certain types of repo-style transactions (broadly speaking government bond repos as defined in paragraphs 3.16.60 and 3.16.61) The Reserve Bank may allow banks using standard supervisory haircuts or own-estimate haircuts not to apply these in calculating the exposure amount after risk mitigation.
- 3.16.26 The effect of master netting agreements covering repo-style transactions can be recognised for the calculation of capital requirements subject to the conditions in paragraph 3.16.63.
- 3.16.27 As a further alternative to standard supervisory haircuts and own-estimate haircuts banks may use VaR models for calculating potential price volatility for repo-style transactions and other similar SFTs, as set out in paragraphs 3.16.68 to 3.16.71 below. Alternatively, subject to Reserve Bank approval, they may also calculate, for these transactions, an expected positive exposure.

On-balance sheet netting...

3.16.28 Where a banking institution has legally enforceable netting arrangements for loans and deposits it may calculate capital requirements on the basis of net credit exposures subject to the conditions in paragraph 3.16.78.

Guarantees and credit derivatives...

3.16.29 Where guarantees or credit derivatives are direct, explicit, irrevocable and unconditional, and the Reserve Bank is satisfied that banks fulfill certain minimum operational conditions relating to risk management processes, banks may be allowed to take account of such credit protection in calculating capital requirements.

3.16.30 A range of guarantors and protection providers are recognised. As under the 1988 Accord (Basel I), 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.

Maturity mismatch...

3.16.31 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 recognised for capital purposes. In other cases where there is a maturity mismatch, partial recognition is given to the CRM for regulatory capital purposes as detailed below in paragraphs 3.16.91 to 3.16.93.

3.16.32 Under the simple approach for collateral maturity mismatches will not be allowed.

Collateral

Eligible financial collateral...

3.16.33 The following collateral instruments are eligible for recognition in the simple approach:

- a) Cash (as well as certificates of deposit or comparable instruments issued by the lending bank) on deposit with the bank which is incurring the counterparty exposure;
- b) Gold;
- c) Debt securities rated by a recognised external credit assessment institution where these are either:
 - at least BB- when issued by sovereigns or PSEs that are treated as sovereigns by the national supervisor; or
 - at least BBB- when issued by other entities (including banks and securities firms); or
 - at least A-3/P-3 for short-term debt instruments.
- d) Debt securities not rated by a recognised external credit assessment institution where these are:
 - issued by a bank; and
 - listed on a recognised exchange; and
 - classified as senior debt; and
 - all rated issues of the same seniority by the issuing bank must be rated at least BBB- or A-3/P-3 by a recognised external credit assessment institution; and
 - the bank holding the securities as collateral has no information to suggest that the issue justifies a rating below BBB- or A-3/P-3 (as applicable); and
 - the supervisor is sufficiently confident about the market liquidity of the security.
- e) Equities (including convertible bonds) that are included in a main index;
- f) Undertakings for Collective Investments in Transferable Securities (UCITS) and unit trust / mutual funds where:
 - a price for the units or NAV is publicly quoted daily; and
 - the UCITS/mutual fund is limited to investing in the instruments listed in this paragraph.

3.16.34 The following collateral instruments are eligible for recognition in the comprehensive approach:

- a) all of the instruments in paragraph 3.16.33;
- b) equities (including convertible bonds) which are not included in a main index but which are listed on a recognised exchange; and
- c) UCITS/mutual funds which include such equities.

The comprehensive approach...

Calculation of capital requirement...

3.16.35 For a collateralised transaction, the exposure amount after risk mitigation is calculated as follows:

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

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.

3.16.36 The exposure amount after risk mitigation will be multiplied by the risk weight of the counterparty to obtain the risk-weighted asset amount for the collateralised transaction.

3.16.37 The treatment for transactions where there is a mismatch between the maturity of the counterparty exposure and the collateral is given in paragraphs 3.16.91 to 3.16.93.

3.16.38 Where the collateral is a basket of assets, the haircut on the basket will be:

$$H = \sum_i a_i H_i$$

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

Standard supervisory haircuts...

3.16.39 These are the standard supervisory haircuts (assuming daily mark-to-market, daily re-margining and a 10-business day holding period), expressed as percentages:

Table 11: Standard Supervisory Haircuts

Issue rating for debt securities	Residual Maturity	Sovereigns	Other issuers
AAA to AA-/A-1	≤ 1 year	0.5	1
	> 1 year, ≤ 5 years	2	4
	> 5 years	4	8
A+ to BBB-/ A-2/A-3/P-3 and unrated bank securities per para. 3.16.33 (d)	≤ 1 year	1	2
	> 1 year, ≤ 5 years	3	6
	> 5 years	6	12
BB+ to BB-	All	15	
Main index equities (including convertible bonds) and Gold		15	
Other equities (including convertible bonds) listed on a recognised exchange		25	
UCITS/Mutual funds		Highest haircut applicable to any security in which the fund can invest	
Cash in the same currency		0	

3.16.40 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).

3.16.41 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 recognised exchange that is not part of a main index.

Own estimates for haircuts...

3.16.42 The Reserve Bank may permit banks to calculate haircuts using their own internal estimates of market price volatility and foreign exchange volatility. Permission to do so will be conditional on the satisfaction of minimum qualitative and quantitative standards stated in paragraphs 3.16.45 to 3.16.54. When debt securities are rated BBB-/A-3 or higher, the Reserve Bank may allow banks to calculate a volatility estimate for each category of security. In determining relevant categories, institutions must take into consideration:

- a) the type of issuer of the security;
- b) its rating;
- c) its residual maturity; and
- d) its modified duration.

3.16.43 Volatility estimates must be representative of the securities actually included in the category for that bank. For debt securities rated below BBB-/A-3 or for equities eligible as collateral

(boxes shaded olive green in the above table), the haircuts must be calculated for each individual security.

- 3.16.44 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 (see paragraphs 3.16.91 to 3.16.93 for the approach to maturity mismatches).

Quantitative criteria...

- 3.16.45 In calculating the haircuts, a 99th percentile, one-tailed confidence interval is to be used.
- 3.16.46 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 paragraph 3.16.34. 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.
- 3.16.47 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.
- 3.16.48 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).
- 3.16.49 Banks should update their data sets no less frequently than once every three months and should also reassess them whenever market prices are subject to material changes. This implies that haircuts must be computed at least every three months. The Reserve Bank may also require a bank to calculate its haircuts using a shorter observation period if, in the Reserve Bank’s judgement, this is justified by a significant upsurge in price volatility.
- 3.16.50 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 criteria...

- 3.16.51 The estimated volatility data (and holding period) must be used in the day-to-day risk management process of the bank.
- 3.16.52 Banks should have robust processes in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system.
- 3.16.53 The risk measurement system should be used in conjunction with internal exposure limits.
- 3.16.54 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:
- a) the integration of risk measures into daily risk management;
 - b) the validation of any significant change in the risk measurement process;
 - c) the accuracy and completeness of position data;
 - d) the verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources; and
 - e) the accuracy and appropriateness of volatility assumptions.

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

- 3.16.55 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.
- 3.16.56 The minimum holding period for various products is summarised in the following table.

Table 12: Minimum holding period for various products

Transaction type	Minimum holding Period	Condition
Repo-style transaction	five (5) business days	daily remargining
Other capital market transactions	ten (10) business days	daily remargining
Secured lending	twenty (20) business days	daily revaluation

3.16.57 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.

3.16.58 When a bank calculates the volatility on a TN 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_M = haircut based on the holding period T_N

3.16.59 For example, for banks using the standard supervisory haircuts, the 10-business day haircuts provided in paragraph 3.16.39 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

Conditions for zero H...

3.16.60 For repo-style transactions where the following conditions are satisfied, and the counterparty is a core market participant, the Reserve Bank 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 modelling approaches as described in paragraphs 3.16.68 to 3.16.73.

- a) both the exposure and the collateral are cash or a sovereign security or PSE security qualifying for a 0% risk weight in the standardised approach;
- b) both the exposure and the collateral are denominated in the same currency;
- c) either the transaction is overnight or both the exposure and the collateral are marked-to-market daily and are subject to daily remargining;
- d) 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;
- e) the transaction is settled across a settlement system proven for that type of transaction;
- f) the documentation covering the agreement is standard market documentation for repo-style transactions in the securities concerned;
- g) the transaction is governed by documentation specifying that if the counterparty fails to satisfy an obligation to deliver cash or securities or to deliver margin or otherwise defaults, then the transaction is immediately terminable; and
- h) upon any default event, regardless of whether the counterparty is insolvent or bankrupt, the bank has the unfettered, legally enforceable right to immediately seize and liquidate the collateral for its benefit.

3.16.61 Core market participants may include, the following entities:

- a) Sovereigns, Central banks and PSEs;
- b) Banking institutions and securities firms;
- c) other financial companies (including insurance companies) eligible for a 20% risk weight in the standardised approach;
- d) regulated mutual funds (e.g. Unit Trusts) that are subject to capital or leverage requirements;
- e) regulated pension funds; and
- f) recognised clearing organisations.

3.16.62 The Reserve Bank allows a banking institution incorporated in Zimbabwe with a subsidiary operating in a jurisdiction where the local supervisor applies a specific carve-out to repo-style transactions in securities issued by its domestic government, to adopt the same approach to the same transactions.

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

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

- a) provide the non-defaulting party the right to terminate and close-out in a timely manner all transactions under the agreement upon an event of default, including in the event of insolvency or bankruptcy of the counterparty;
- b) provide for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it so that a single net amount is owed by one party to the other;
- c) allow for the prompt liquidation or setoff of collateral upon the event of default; and
- d) be, together with the rights arising from the provisions required in (a) to (c) above, legally enforceable upon the occurrence of an event of default and regardless of the counterparty's insolvency or bankruptcy.

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

- a) all transactions are marked to market daily; and
- b) the collateral instruments used in the transactions are recognised as eligible financial collateral in the banking book.

3.16.65 The formula in paragraph 3.16.35 will be adapted to calculate the capital requirements for transactions with netting agreements.

3.16.66 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:

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

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

3.16.67 The formula results in a net exposure amount after netting of the exposures and collateral as well as an add-on amount reflecting possible price changes for the securities involved in the transactions and for foreign exchange risk if any. The net long or short position of each security included in the netting agreement will be multiplied by the appropriate haircut. All other rules regarding the calculation of haircuts stated in paragraphs 3.16.35 to 3.16.62 equivalently apply for banks using bilateral netting agreements for repo-style transactions.

Use of models...

3.16.68 As an alternative to the use of standard or own-estimate haircuts, banks may be permitted to use 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. Firms are also eligible to use the VaR model approach for margin lending transactions, if the transactions are covered under a bilateral master netting agreement that meets the requirements of paragraphs 3.16.63 and 3.16.64. The VaR models approach is available to a banking institution that has received approval for the use of an

internal market risk model under the Market Risk Amendment. Banking institutions which have not received supervisory recognition for use of models under the Market Risk Amendment can separately apply for supervisory recognition to use their internal VaR models for calculation of potential price volatility for repo-style transactions.

3.16.69 Internal models will only be accepted when a bank can prove the quality of its model to the Reserve Bank through the back-testing of its output using one year of historical data. Banks must meet the model validation requirements to use VaR for repo-style and other SFTs. In addition, other transactions similar to repo style transactions (like prime brokerage) that meet the requirements for repo-style transactions, are also eligible to use the VaR models approach provided the model used meets the operational requirements.

3.16.70 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 Amendment. 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.

3.16.71 The calculation of the exposure E^* for banks using their internal model will be the following:

$$E^* = \max\left\{0, \left[\left(\sum E - \sum C\right) + VaR \text{ output from internal model}\right]\right\}$$

3.16.72 In calculating capital requirements banks will use the previous business day's VaR number.

3.16.73 Subject to Reserve Bank approval, instead of using the VaR approach, banks may also calculate an expected positive exposure for repo-style and other similar SFTs, in accordance with the Internal Model Method.

The simple approach:

Minimum conditions...

3.16.74 For collateral to be recognised in the simple approach, 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. Those portions of claims collateralised by the market value of

recognised collateral receive the risk weight applicable to the collateral instrument. The risk weight on the collateralised portion will be subject to a floor of 20% except under the conditions specified in paragraphs 3.16.75 to 3.16.77. 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 collateralised transaction: for example, both repos and reverse repos will be subject to capital requirements.

Exceptions to the risk weight floor...

- 3.16.75 Transactions which fulfill the criteria outlined in paragraph 3.16.39 and are with a core market participant, as defined in 3.16.40; 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%.
- 3.16.76 OTC derivative transactions subject to daily mark-to-market, collateralised by cash and where there is no currency mismatch should receive a 0% risk weight. Such transactions collateralised by sovereign or PSE securities qualifying for a 0% risk weight in the standardised approach can receive a 10% risk weight.
- 3.16.77 The 20% floor for the risk weight on a collateralised 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 on deposit as defined in paragraph 3.16.33 (a); or
 - 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%.

On-balance sheet netting

- 3.16.78 Where a bank:
- a) has a well-founded legal basis for concluding that the netting or offsetting agreement is enforceable in each relevant jurisdiction regardless of whether the counterparty is insolvent or bankrupt;
 - b) is able at any time to determine those assets and liabilities with the same counterparty that are subject to the netting agreement;

- c) monitors and controls its roll-off risks; and
- d) 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 3.16.35. 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 and all the requirements contained in paragraphs 3.16.39, 3.16.59, and 3.16.91 to 3.16.93 will apply.

Guarantees

Operational requirements common to guarantees and credit derivatives...

- 3.16.79 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 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.
- 3.16.80 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.

Additional operational requirements for guarantees...

- 3.16.81 In addition to the legal certainty requirements in paragraph 3.16.4 above, in order for a guarantee to be recognised, the following conditions must 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; and
- 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 in accordance with paragraph 3.16.85.

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

3.16.82 Credit protection given by the following entities will be recognised:

- a) sovereign entities, PSEs, banks and securities firms with a lower risk weight than the counterparty; and
- b) other entities rated 3 or better. This would include credit protection provided by parent, subsidiary and affiliate companies when they have a lower risk weight than the obligor.

Risk weights...

3.16.83 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.

3.16.84 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.

Proportional cover...

3.16.85 Where the amount guaranteed, or against which credit protection is held, is less than the amount of the exposure, and the secured and unsecured portions are of equal seniority, i.e. the bank and the guarantor share losses on a pro-rata basis capital relief will be afforded on a proportional basis: i.e. the protected portion of the exposure will receive the treatment applicable to eligible guarantees, with the remainder treated as unsecured.

Tranched cover...

3.16.86 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). In this

case the rules as set out in Guideline No. 01-2007/BSD: Special Purpose Vehicles, Securitisation and Structured Finance will apply.

Currency mismatches...

- 3.16.87 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 will 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.

- 3.16.88 The appropriate haircut based on a 10-business day holding period (assuming daily marking-to-market) will be applied. If a bank uses the supervisory haircuts it will be 8%. The haircuts must be scaled up using the square root of time formula, depending on the frequency of revaluation of the credit protection as described in paragraph 3.16.57.

Sovereign guarantees and counter-guarantees...

- 3.16.89 A 0% risk weight is applied to a bank's exposures to the government (or the Reserve Bank) where the exposure is denominated in local currency and funded in that currency. This treatment also applies to portions of claims guaranteed by the government (or the Reserve Bank), where the guarantee is denominated in the domestic currency and the exposure is funded in that currency. A claim may be covered by a guarantee that is indirectly counter-guaranteed by the government. Such a claim may be treated as covered by a government guarantee provided that:

- a) the government counter-guarantee covers all credit risk elements of the claim;
- b) 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
- c) the Reserve Bank 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.

Maturity mismatches

3.16.90 For the purposes of calculating risk-weighted assets, a maturity mismatch occurs when the residual maturity of a hedge is less than that of the underlying exposure.

Definition of maturity...

3.16.91 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.

Risk weights for maturity mismatches

3.16.92 As outlined in paragraph 3.16.13, hedges with maturity mismatches are only recognised **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 recognised. In all cases, hedges with maturity mismatches will no longer** be recognised when they have a residual maturity of three months or less.

3.16.93 When there is a maturity mismatch with recognised credit risk mitigants (collateral, on-balance sheet netting, guarantees and credit derivatives) the following adjustment will be applied.

$$P_a = \frac{P \times (t - 0.25)}{(T - 0.25)}$$

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.

3.17 Internal Ratings-Based Approach to Credit Risk

Overview

- 3.17.1 Subject to certain minimum conditions and disclosure requirements, the Reserve Bank shall approve the use of internal systems by banking institutions in the calculation of regulatory capital.
- 3.17.2 A bank which has received IRB approval may rely on its own internal estimates for determining the capital requirement for given credit exposures.
- 3.17.3 The credit risk components include measures of probability of default (PD), loss given default (LGD), exposure at default (EAD) and maturity (M).
- 3.17.4 The risk components, each of which is defined later in this section, serve as inputs to the risk-weight functions that have been developed for separate asset classes.
- 3.17.5 A banking institution's rating system must play an integral role in credit approval, risk management and internal capital allocation functions.
- 3.17.6 The IRB approach is based upon measures of unexpected losses (UL) and expected losses (EL).
- 3.17.7 The risk-weight functions produce the capital requirement for UL. With respect to expected losses a banking institution must compare the eligible provisions against EL amounts.
- 3.17.8 The treatment of each asset class begins with a presentation of the relevant risk-weight function(s) followed by the risk components and other relevant factors, such as the treatment of credit risk mitigants.
- 3.17.9 There are two IRB approaches to credit risk: the foundation IRB (FIRB) approach and the advanced IRB (AIRB) approach.
- 3.17.10 Under the FIRB approach, a banking institution provides its own estimates of PD and M and relies on supervisory estimates for LGD and EAD.
- 3.17.11 Under the AIRB approach, a banking institution provides its own estimates of all the credit risk components.
- 3.17.12 Under both approaches, a bank must use the relevant IRB risk-weight function, for the purpose of deriving the capital requirement for UL for IRB asset classes.

3.18 Definitions

3.18.1 The following definitions apply in this Guideline:

- a) probability of default (PD) - the risk of obligor default;
- b) exposure at default (EAD) - the gross exposure under a facility (i.e. the amount that is legally owed to the banking institution) upon default of an obligor;
- c) loss given default (LGD) - the banking institution's economic loss upon the default of an obligor;
- d) purchased receivables - a pool of receivables that have been purchased by a banking institution from another entity;
- e) dilution risk - the possibility that the total amount of purchased receivables is reduced through cash or non-cash credits to the receivables' obligors. Examples include offsets or allowances arising from returns of goods sold, disputes regarding product quality, possible debts of the obligor to obligors of the purchased receivables and any payment or promotional discounts offered by the obligor;
- f) rating system - all methods, processes, controls, data collection and technology that support the assessment of credit risk, the assignment of internal credit risk ratings and the quantification of associated default, exposure and loss estimates; and
- g) subordinated claim - a facility that is expressly subordinated to another facility.

3.19 Categorisation of IRB exposures

3.19.1 Under the IRB approach a banking institution must categorise banking book exposures into six broad classes and several sub-classes of assets with different underlying risk characteristics.

3.19.2 The classes of assets are: (a) corporate (which includes four sub-asset classes of SL), (b) sovereign, (c) bank, (d) retail (which consists of three separate sub-asset classes), (e) equity and, (f) a residual asset class.

3.19.3 A banking institution may adopt a different system of classification in its internal risk management and measurement systems, however the bank must demonstrate that the methodology for assigning credit exposures to different IRB asset classes is appropriate and consistent over time.

Corporate IRB asset class

- 3.19.4 A corporate exposure is a debt obligation of a corporation, partnership, or proprietorship.
- 3.19.5 The corporate IRB asset class includes, but is not limited to, four SL sub-asset classes: project finance, object finance, commodities finance and income-producing real estate.
- a) the exposure is typically to an entity (often a special purpose vehicle) which was created specifically to finance and/or operate specific assets;
 - b) apart from the income that it receives from the assets being financed, the borrowing entity has little or no other material assets or activities and therefore has little or no independent capacity to repay the obligation;
 - c) the terms of the obligation give the banking institution a substantial degree of control over the assets and the income that it generates; and
 - d) as a result of the preceding factors, the primary source of repayment of the obligation is the income generated by the assets rather than the independent capacity of a broader commercial enterprise.

Sovereign IRB asset class

- 3.19.6 The sovereign IRB asset class includes credit exposures to the counterparties detailed in the MSA of this Guideline.

Bank IRB asset class

- 3.19.7 The bank IRB asset class includes credit exposures to the counterparties detailed in the MSA. The bank IRB asset class excludes exposures to entities that are wholly owned or effectively controlled by the banking institution.

Retail IRB asset class

- 3.19.8 An exposure is categorised as a retail exposure if it is extended to an individual (that is, a natural person) or individuals and is part of a large pool of exposures that are managed by the banking institution on a pooled basis and is not margin lending.
- 3.19.9 Small-business exposures, whether or not extended to an individual, may be treated as retail exposures if the banking institution treats such exposures in its internal risk management systems in the same manner as other retail exposures consistently over time. This requires that such exposures are originated in a similar manner to other retail exposures. Furthermore, the exposure must not be managed individually in a way that is comparable to an exposure in the

corporate IRB asset class but rather as part of a portfolio segment or pool of exposures with similar risk characteristics for purposes of risk assessment and quantification. This does not preclude these exposures from being managed individually at some stages of the risk management process. To be regarded as a retail exposure, the total business-related exposure of the consolidated banking group to a small-business obligor or group of connected small-business obligors must be less than \$100 000.²A banking institution must have policies detailing the criteria that connect small-business obligors for this purpose. Small-business loans extended through, or guaranteed by, an individual are subject to the same exposure threshold.

3.19.10 Within the retail IRB asset class, a banking institution is required to identify three separate sub-asset classes of exposures:

- a) exposures that are partly or fully secured by residential properties;
- b) qualifying revolving retail (QRR). The following criteria must be satisfied for a sub-portfolio to be included in the QRR sub-asset class:
 - i. the exposures are revolving, unsecured and unconditionally cancellable (both contractually and in practice) by the banking institution.³ 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 banking institution ;
 - ii. the exposures are to individuals and not explicitly for business purposes;
 - iii. the maximum exposure of an individual account in the sub-portfolio is \$100,000;
 - iv. the banking institution must demonstrate that the use of the QRR risk-weight function is limited to exposures that have exhibited, in comparison with other types of lending products, low loss rate volatility relative to the average level of

²An exception to this is for subsidiaries in jurisdictions where a different threshold is set by the national regulator for small-business retail exposures.

³ Exposures may be considered unconditionally cancellable if the terms of the contract permit the ADI to cancel at any time any existing credit lines or limits provided to a customer at the banking institution's discretion, and demand immediate repayment for any outstanding balance to the full extent allowable under consumer protection and related legislation.

loss rates (especially within low PD bands). The Reserve Bank will review the relative volatility of loss rates across relevant QRR sub-portfolios, as well as the aggregate of the QRR sub-asset class. Data on loss rates for the relevant QRR sub-portfolios and the QRR sub-asset class must be retained by the banking institution in order to allow analysis of the volatility of loss rates; and

- v. the banking institution is able to demonstrate to The Reserve Bank that treatment of an exposure as a QRR exposure is consistent with the underlying risk characteristics of the sub-asset class; and
- c) all other retail exposures.

Equity IRB Asset Class

3.19.11 Equity exposures include both direct and indirect ownership interests,⁴ whether voting or non-voting, in the assets and income of entities, including commercial enterprises and financial institutions. Equity exposures are defined on the basis of the economic substance of the instrument and include instruments that meet the following criteria:

- a) the instrument is irredeemable in that the return of invested funds can be achieved only by the sale of the investment, the sale of the rights to the investment or by the liquidation of the issuer; and
- b) the instrument does not embody an obligation of the issuer.

3.19.12 Debt obligations and other securities, units in trusts, or other instruments structured with the intent or effect of conveying the economic substance of equity ownership must be treated as equity exposures, including for IRB purposes.⁵ This includes options and warrants on equities and short positions in equity securities. In addition, if a debt instrument is convertible into equity at the option of a banking institution, it should be deemed equity on conversion. If such an instrument is convertible at the option of the issuer or automatically by the terms of the instrument, it should be categorised by the banking institution as equity from inception.

⁴ Indirect equity interests include holdings of derivative instruments tied to equity interests and holdings in corporations, partnerships, limited liability companies, trusts or other types of entities that issue ownership interests and are engaged principally in the business of investing in equity instruments.

⁵ Equities that are recorded as a loan but arise from a debt/equity swap made as part of the orderly realisation or restructuring of the debt must be included in the equity IRB asset class.

- 3.19.13 Instruments with a return directly linked to equities should be characterised as equity exposures. Subject to written approval by The Reserve Bank, a banking institution may exclude these instruments from the equity IRB asset class where they are directly hedged by an equity holding such that the position does not expose the banking institution to material equity risk.
- 3.19.14 Equity instruments that are structured with the intent of conveying the economic substance of debt holdings are not required to be treated as equity exposures. Similarly, for the purposes of this Guideline, equity exposures required to be deducted from capital pursuant to Guideline No.02-2007/BSD: Consolidated Supervision Policy Framework may be excluded from the equity IRB asset class.

Expected loss and eligible provisions

- 3.19.15 Other than for that portion of exposures covered by eligible guarantees or credit derivatives subject to the double default approach, a banking institution that has IRB approval must separately calculate, for non-defaulted and defaulted exposures, total EL aggregated across the corporate, sovereign, bank and retail IRB asset classes.⁶ Other than for SL exposures subject to the slotting approach, EL is calculated as follows:
- a. for non-defaulted exposures, the product of PD, LGD and EAD;
 - b. for defaulted exposures under the AIRB approach and the IRB approach for retail exposures, the banking institution's best estimate of EL given current economic circumstances and the facility's status; and
 - c. for defaulted corporate, sovereign and bank exposures under the FIRB approach, the product of the relevant supervisory estimates of LGD and EAD.
- 3.19.16 EL for SL exposures subject to the slotting approach must be calculated as ten per cent of the risk-weighted asset amount.⁷ The risk-weight to be used in this calculation is determined by the relevant slotting category to which the exposure has been mapped (refer to Table 1).

⁶ EL and relevant provisions associated with other IRB asset classes are excluded from the calculation of total EL and eligible provisions respectively.

⁷ The risk-weighted asset amount consists of the total of the on-balance sheet component and the off-balance sheet equivalent multiplied by the relevant risk-weight in Table 1. For the on-balance sheet component, the amount that is

Table 13 Risk-weights for EL under the slotting approach

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

3.19.17 For exposures in the IRB asset classes detailed in paragraph 3.19.15 (including, in all cases, SL), total eligible provisions associated with those exposures are:

- a) credit related provisions (e.g. specific provisions and General Reserves for Credit Losses net of deferred tax assets associated with those reserves;⁸
- b) partial write-offs; and
- c) discounts on defaulted assets.

3.19.18 Where a banking institution that has IRB approval uses the standardised approach to credit risk for a portion of its exposures, it must attribute total General Reserves for Credit Losses on a pro rata basis according to the proportion of risk-weighted assets subject to the standardised and IRB approaches. However, when the standardised approach to credit risk is used exclusively by an entity within a consolidated banking group, all of the General Reserves for Credit Losses booked within that entity must be attributed to the standardised approach. Similarly, General Reserves for Credit Losses booked by entities within the consolidated banking group that exclusively uses an IRB approach to credit risk qualify as eligible provisions.

3.19.19 A banking institution that has IRB approval must compare the total EL amount for:

- a) defaulted IRB exposures; and
- b) non-defaulted exposures to total eligible provisions (see paragraph 3.19.17) associated with the relevant exposures.

3.19.20 In all cases detailed in paragraph 3.19.19, where the total EL amount is higher than total eligible provisions for the relevant exposures, the difference must be deducted on the basis of 50 per cent from Tier 1 capital and 50 per cent from Tier 2 capital.

multiplied by the relevant risk-weight is the book value of the exposure gross of any specific provisions. Off-balance sheet exposures are converted to on-balance sheet equivalents using the FIRB credit conversion factors.

⁸ Any amount included in a banking institution's General Reserve for Credit Losses may only be used as an eligible provision to offset EL for non-defaulted exposures.

3.19.21 For non-defaulted exposures, where the total EL amount associated with such exposures is lower than eligible provisions associated with these exposures, that amount of the difference made up of the General Reserve for Credit Losses may be included in Tier 2 capital up to a maximum of 0.6 per cent of risk-weighted assets.

3.20 Approval process

3.20.1 A banking institution may apply for written approval from the Reserve Bank to use advanced approaches for capital adequacy purposes.

3.20.2 In its application, the banking institution must, unless exempted in writing by the Reserve Bank, seek approval to use:

- a) IRB for the purpose of determining the banking institution's regulatory capital for credit risk;
- b) an advanced measurement approach to operational risk for the purpose of determining the banking institution's regulatory capital for operational risk ; and
- c) an internal risk measurement model for the purpose of determining the banking institution's regulatory capital for interest rate risk in the banking book unless the Reserve Bank has previously approved the banking institution's use of the approach or model.

3.20.3 The Reserve Bank may, in writing, approve the use of advanced approaches by a banking institution. The approval may specify how the approach is to apply in relation to the banking institution. Subsequent to obtaining approval, a banking institution must notify the Reserve Bank if it intends to make changes to its risk modelling systems that will result in a material change in the banking institution's risk-weighted asset amount for a given type of exposure or if the banking institution intends to make a significant change to its modelling assumptions. The Reserve Bank may impose conditions on the approval.

3.20.4 In order to obtain approval to use advanced approaches, a banking institution must demonstrate to the Reserve Bank that it has been using, for the relevant asset or sub-asset classes, risk modelling systems that are broadly in line with the requirements of this Guideline for at least three years prior to any approval being given. Improvements to a banking institution's risk modelling system will not render it non-compliant with this three-year requirement.

- 3.20.5 Once a banking institution has obtained approval for advanced approaches, it must continue to employ them on an ongoing basis unless, or except to the extent that, the approval is revoked or suspended for some or all of the banking institution's operations. A return, at the banking institution's request, to a standardised approach where the banking institution has approval to use an advanced approach, will generally only be permitted in exceptional circumstances.
- 3.20.6 The Reserve Bank may, at any time in writing to the banking institution, vary or revoke an advanced approach approval, or impose additional conditions on the approval if it determines that:
- a) the banking institution does not comply with this Guideline; or
 - b) it is appropriate, having regard to the particular circumstances of the banking institution to impose the additional conditions or make the variation or revocation.
- 3.20.7 Where an approval to use an advanced approach for a banking institution has been varied or revoked, the Reserve Bank may, in writing, require the banking institution to revert to the standardised approach for some or all of its operations, until it meets the conditions specified by the Reserve Bank for returning to the advanced approach.
- 3.20.8 A banking institution that has approval to use internal models may become aware that it is not complying with a requirement of this Guideline. Where this is the case, the banking institution must notify the Reserve Bank and provide the banking institution's plan for the timely return to compliance. Failure to notify the Reserve Bank, produce an acceptable plan, satisfactorily implement the plan or demonstrate that the non-compliance is immaterial will result in reconsideration by the Reserve Bank of the banking institution's eligibility to use the advanced approach. Furthermore, for the duration of any non-compliance, the Reserve Bank may require the banking institution to hold additional regulatory capital or take other supervisory action, as appropriate.
- 3.20.9 The Reserve Bank may, in writing, require a banking institution to reduce its level of associated risk or increase its capital if the Reserve Bank considers that the banking institution's capital for that risk under an advanced approach is not commensurate with its risk profile under which it uses internal models.

3.21 Adoption of the IRB approach

- 3.21.1 The Reserve Bank will generally require a banking institution that has IRB approval to apply the IRB approach across all asset classes of the banking institution. The Reserve Bank recognises, however, that for many banking institutions it may not be practical to implement

the IRB approach across all material IRB asset classes and business units at the same time. This may be the case, for instance, where a banking institution moves from the standardised approach to credit risk to the IRB approach, undertakes a new business activity, has acquired a new business through merger or acquisition or has certain immaterial business activities (see paragraph 3.21.6). In such circumstances, the Reserve Bank's approval of the IRB approach may permit the banking institution to use a combination of the IRB approach and the standardised approach to credit risk. This approach is referred to as partial use.

- 3.21.2 A banking institution must provide the Reserve Bank with appropriate written information, both at the time of the banking institution's initial application for the IRB approach and subsequent to the banking institution obtaining IRB approval, on any business activities for which the banking institution proposes to use the standardised approach to credit risk.
- 3.21.3 Subject to approval by the Reserve Bank, a banking institution may adopt a phased roll-out of the IRB approach across the consolidated banking group. Notwithstanding, when a banking institution adopts the IRB approach for an IRB asset or sub-asset class within a particular business unit, it will be required to apply that IRB approach to all exposures in that IRB asset or sub-asset class within that business unit.
- 3.21.4 The Reserve Bank's approval of a phased roll-out may provide for the banking institution to use the slotting approach for one or more of the SL sub-asset classes and move to the FIRB or AIRB approach for other SL sub-asset classes.
- 3.21.5 A banking institution that has received approval to adopt a phased roll-out of the IRB approach must have a written Reserve Bank -approved implementation plan in place that specifies the extent and timing of roll-out of the IRB approach across all significant asset or sub-asset classes and business units. During the roll-out period, no capital relief will be granted for intra-group transactions that reduce the banking institution's aggregate capital requirement by transferring credit risk among entities on the standardised approach to credit risk, FIRB approach and AIRB approach. This includes, but is not limited to, asset sales and cross-guarantees.
- 3.21.6 Permanent partial use of the IRB approach will be approved only in exceptional circumstances and where the banking institution is able to demonstrate that those business activities to which the IRB approach does not apply are immaterial in terms of size and perceived risk profile. The calculated credit risk capital requirement for such business activities, if considered necessary by the Reserve Bank, may be subject to additional regulatory capital.

3.22 Governance and quantification requirements

- 3.22.1 The minimum requirements set out in this section apply to all IRB asset classes, unless noted otherwise.
- 3.22.2 The principles underlying this section are that a banking institution's credit risk rating and associated risk estimation systems and processes provide for a meaningful assessment of obligor and transaction characteristics, a meaningful differentiation of risk and quantitative estimates of risk that are consistent, verifiable, relevant and soundly based. Furthermore, the internal ratings and quantitative risk estimates associated with those systems and processes must play an essential role in the banking institution's risk management and decision-making processes.
- 3.22.3 A banking institution that has obtained IRB approval must produce its own estimates of PD⁹ and in the case of corporate, sovereign and bank exposures, M, and adhere to the overall requirements for rating system design, operation, controls and governance as well as the requisite requirements for estimation and validation of PD and M estimates. A banking institution that has approval to use the AIRB approach or the retail IRB approach must also meet the incremental minimum requirements relating to LGD and EAD as detailed in this section.

Rating system design

- 3.22.4 Within each relevant IRB asset class, a banking institution may utilise multiple rating methodologies or systems. If the banking institution chooses to use multiple methodologies or systems, the rationale for assigning an obligor to a rating methodology or system must be documented and applied in a manner that best reflects the level of risk of the obligor. The banking institution must not inappropriately allocate obligors across rating methodologies or systems to minimise its capital requirement. The banking institution must demonstrate that each methodology or system used for IRB purposes is in compliance with the minimum requirements at the time of approval by the Reserve Bank and on an ongoing basis.

Rating dimensions

⁹ A banking institution is not required to produce its own estimates of PD for equity exposures and other assets and claims detailed in this guideline and specialised lending exposures where the banking institution uses the slotting approach.

Standards for the corporate, sovereign and bank IRB asset classes

- 3.22.5 An IRB rating system for exposures in the corporate, sovereign and bank IRB asset classes must have two separate and distinct dimensions.
- 3.22.6 The first dimension (the obligor grade) must be orientated to the risk of obligor default (that is, it must solely reflect PD). Separate exposures to the same obligor must be assigned the same obligor grade, irrespective of any differences in the nature of each specific transaction. There are two exceptions to this:
- a. in the case of country transfer risk, where a banking institution may assign different obligor grades depending on whether the facility is denominated in domestic or foreign currency; and
 - b. where the treatment of associated guarantees to a facility is reflected in an adjustment to the obligor grade.
- 3.22.7 In each case, separate exposures to the same obligor may be assigned different obligor grades.
- 3.22.8 An obligor grade must represent an assessment of obligor risk on the basis of a specified and distinct set of rating criteria from which estimates of PD are derived. A banking institution's credit policies must articulate the relationship between obligor grades in terms of the level of credit risk each grade implies. Perceived and measured credit risk must increase as credit quality declines from one grade to the next. The credit policies must articulate the credit risk of each grade in terms of both a description of the default risk typical for obligors assigned to the grade and the criteria used to distinguish that level of credit risk. Modifiers such as '+' or '-' to alpha or numeric obligor grades will only qualify as distinct grades if a banking institution has developed complete rating descriptions and criteria for their assignment and separately quantifies PD estimates for those modified grades.
- 3.22.9 The second dimension (the facility grade) must reflect transaction-specific factors such as collateral, seniority and product type (that is, it must solely reflect LGD). Obligor characteristics may be included as LGD rating criteria to the extent that they are predictive of LGD. An exception to this is the FIRB approach where a banking institution may satisfy this requirement by using a facility grade dimension that reflects both obligor and transaction-specific factors. Where a facility grade dimension reflects EL and does not separately quantify LGD, the supervisory estimates of LGD specified herein must be used.

3.22.10 A banking institution that uses the slotting approach for one or more of the SL sub-asset classes is also exempt from the two-dimensional rating requirement for these exposures. Given the interdependence between obligor and transaction characteristics in SL, the banking institution may have a single rating dimension that reflects EL by incorporating both PD and LGD considerations. This exemption does not apply to a banking institution that has received approval from the Reserve Bank to use either the general corporate FIRB or AIRB approach for one or more of the SL sub-asset classes.

Standards for the retail IRB asset class

3.22.11 Rating systems for retail exposures must be orientated to both obligor and transaction risks and must capture all relevant obligor and transaction characteristics. A banking institution must assign each exposure that falls within the retail IRB asset class into a particular pool reflecting EL or particular pools separately reflecting PD, LGD and EAD. The banking institution 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 PD, LGD and EAD at the pool level.

3.22.12 Different pools of retail exposures may share identical PD, LGD and EAD estimates.

3.22.13 At a minimum, a banking institution must consider the following risk drivers when assigning retail exposures to a pool:

- a. obligor risk characteristics (e.g. obligor type, demographics such as age and occupation);
- b. transaction risk characteristics including product or collateral (e.g. loan to valuation measures, seasoning, guarantees and seniority (first or second liens)). The banking institution must explicitly address cross-collateral provisions where present; and
- c. delinquency of exposure. The banking institution must identify separately non-defaulted and defaulted exposures.

Rating structure

Standards for the corporate, sovereign and bank IRB asset classes

- 3.22.14 Banking institution must have a meaningful distribution of exposures across its credit risk rating grades with no excessive concentrations on either its obligor grades and, where relevant, its facility grades.
- 3.22.15 Subject to the exception noted in paragraph 3.22.17, a banking institution must have a minimum of seven obligor grades for non-defaulted obligors and one for defaulted obligors. A banking institution with lending activities focused on a particular market segment may satisfy this requirement with the minimum number of grades whilst ensuring that there are a sufficient number of grades to avoid undue concentrations of obligors in particular grades. Significant concentrations within a single grade or grades must be supported by empirical evidence that the grade or grades cover reasonably narrow PD bands and that the default risk posed by obligors in each grade fall within the relevant band. A banking institution that lends to obligors of diverse credit quality should have a greater number of obligor grades.
- 3.22.16 There is no minimum number of facility grades for a banking institution using the AIRB approach for exposures in the corporate, sovereign and bank IRB asset classes. In this case, a banking institution must have a sufficient number of facility grades to avoid grouping facilities with widely varying LGD estimates into a single grade. The criteria used to define facility grades must be grounded in empirical evidence.
- 3.22.17 A banking institution using the slotting approach for one or more of the SL sub-asset classes must have at least four rating grades for non-defaulted obligors and one for defaulted obligors.
- 3.22.18 A banking institution must be able to provide quantitative measures of PD, LGD and EAD for each identified pool of retail exposures. The level of differentiation for IRB purposes must ensure that the number of exposures in a given pool is sufficient to allow for meaningful quantification and validation of the loss characteristics at the pool level. There must also be a meaningful distribution of obligors and exposures across pools, with no single pool comprising an undue concentration of the banking institution's total retail exposures.

Rating criteria

- 3.22.19 A banking institution must have specific rating definitions, processes and criteria for assigning exposures to grades or pools within a rating system. The rating definitions and criteria must be both plausible and intuitive and result in a meaningful differentiation of risk.
- 3.22.20 A banking institution's internal rating descriptions and criteria must be sufficiently detailed to allow officers to assign consistently the same rating to obligors and 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 obligors or facilities, the banking institution must monitor for possible inconsistency and alter rating criteria to improve consistency where appropriate.

- 3.22.21 Written rating definitions must be clear and detailed so as to allow independent third parties, including the Reserve Bank, to understand the assignment of ratings, replicate rating assignments and evaluate the appropriateness of the assignment of exposures to grades or pools. The criteria must also be consistent with the banking institution's lending standards and its policies for managing obligors and facilities that have deteriorated in credit quality.
- 3.22.22 A banking institution must use all relevant and material information in assigning obligors and facilities to grades or pools. Information must be current. The less information the banking institution has the more conservative it must be in assigning exposures to obligor and facility grades or pools. An external rating may be used as an input into the assignment process; however, the banking institution must ensure that it considers all other relevant material information.

Specialised lending within the corporate IRB asset class

- 3.22.23 A banking institution that uses the slotting approach for one or more of the SL sub-asset classes must comply with the minimum requirements detailed in this section, with the exception of those relating to risk quantification. In relation to risk quantification, the banking institution must assign its SL exposures to its internal rating grades based on its own criteria, systems and processes. The banking institution must have a documented conservative and consistent process that maps those internal rating grades into the slotting categories of *strong*, *good*, *satisfactory*, *weak* and *default*. The banking institution must ensure that overrides of its internal criteria do not render the mapping process ineffective.
- 3.22.24 Although the time horizon required for PD estimation is one year, a banking institution must use a longer time horizon when assigning obligor grades to exposures.
- 3.22.25 An obligor grade must represent a banking institution's assessment of the obligor's ability and willingness to perform contractually despite adverse economic conditions or the occurrence of unexpected events.
- 3.22.26 Given the difficulties in forecasting future events and the influence they could have on a particular obligor's financial condition, a banking institution must take a conservative view of

projected information. Furthermore, where limited data are available, the banking institution must adopt a conservative bias in its analysis.

Use of Models in the Rating Process

- 3.22.27 The requirements in this section apply to quantitative models and other mechanical methods used to assign obligor or facility grades and in the estimation of PD, LGD and EAD.
- 3.22.28 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 under the IRB approach. However, judgement and oversight must also be used to ensure that all relevant and material information, including that which is outside the scope of any such model or other mechanical procedure, is also taken into consideration and that the model or other procedure is used appropriately. For the removal of doubt, purely quantitative models and other mechanical methods used to assign obligor or facility grades are not acceptable. A banking institution must have written guidance detailing how judgement and model results are combined.
- 3.22.29 Where a banking institution uses a quantitative model or other mechanical method in its rating process, the banking institution must satisfy the Reserve Bank that the model or procedure has good predictive power and that regulatory capital will not be distorted as a result of its use. The variables that are used in the model or procedure must form a reasonable set of predictors. On average, the model must be accurate across the range of obligors or facilities to which the banking institution is exposed and there must be no known material biases.
- 3.22.30 A banking institution must have in place a process for vetting data inputs into a statistical default or loss prediction model which includes an assessment of the accuracy, completeness and appropriateness of the data specific to the assignment of an obligor or facility grade.
- 3.22.31 A banking institution must demonstrate that the data used to build its models are representative of the population of the banking institution's actual obligors or facilities.
- 3.22.32 A banking institution must have documented policies and procedures for review of model-based rating assignments. Such procedures should focus on finding and limiting errors

associated with known model weaknesses and must include credible ongoing efforts to improve the model's performance.

- 3.22.33 A banking institution must have 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.

Documentation of rating system design

- 3.22.34 A banking institution must document the design and operational details of its rating and quantification systems.

- 3.22.35 A banking institution must document the rationale for its choice of internal rating criteria and must be able to provide analysis demonstrating that rating criteria and procedures are likely to result in ratings that meaningfully differentiate risk. These rating criteria and procedures must be periodically reviewed to determine whether they remain fully applicable to the current portfolio and to external conditions.

- 3.22.36 A banking institution must document the history of major changes in its credit risk rating process and such documentation must support identification of changes made to the credit risk rating process. The organisation of rating assignment, including the internal control structure, must also be documented.

- 3.22.37 A banking institution must document the specific definitions of default and loss that are used internally and demonstrate consistency with the reference definitions set out in this Guideline.

- 3.22.38 Where a banking institution employs quantitative models in its rating process, it must document its methodologies. This documentation must include:

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

- 3.22.39 Use of a third-party vendor model that claims proprietary technology or information is not a justification for exemption from documentation or any other of the requirements for rating

systems. The banking institution must satisfy the Reserve Bank as to the model's compliance with the requirements.

Rating coverage

- 3.22.40 For exposures in the corporate, sovereign and bank IRB asset classes, each obligor and eligible guarantor or credit protection provider must be assigned an obligor grade and each exposure must be associated with a facility grade as part of the loan approval process. Similarly, for the retail IRB asset class, each exposure must be assigned to a pool as part of the loan approval process.
- 3.22.41 Each separate legal entity to which a banking institution is exposed must be separately rated. The banking institution must have documented policies regarding the treatment of individual entities in a connected group, including the circumstances under which the same rating may or may not be assigned to some or all related entities.

Integrity of the rating process

Standards for the corporate, sovereign and bank IRB asset classes

- 3.22.42 Unless otherwise approved in writing by the Reserve Bank, 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 may be achieved through a range of practices that will be reviewed by The Reserve Bank. These operational practices must be documented in the banking institution's policies and procedures manuals. Credit policies and underwriting procedures must reinforce and foster the independence of the rating process.
- 3.22.43 Obligor and facility grades must be refreshed on at least an annual basis. Certain exposures, especially higher risk obligors or problem exposures, must be subject to more frequent (than annually) rating review. In addition, a banking institution must initiate a new rating review when material information on the obligor or facility comes to light.
- 3.22.44 A banking institution must have an established process to obtain and update relevant and material information on the obligor's financial condition and other characteristics that affect assigned estimates of PD, LGD and EAD. Upon receipt, the banking institution must have a procedure to update the obligor's ratings in a timely fashion.

Standards for the retail IRB asset class

- 3.22.45 A banking institution must review the loss characteristics and delinquency status of each identified pool, at least on an annual basis. This would include a review of the status of individual obligors within each pool as a means of ensuring that exposures continue to be assigned to the correct pool.

Overrides

- 3.22.46 For rating assignments based on expert judgement, a banking institution must clearly document the situations in which officers may override the outputs of the rating process, including how and to what extent such overrides can be made and by whom.
- 3.22.47 For model-based ratings, a banking institution must have guidelines and processes for monitoring cases where judgement has overridden the model's rating, variables that were excluded or inputs that were altered. Those guidelines must include identifying personnel who are responsible for approving such overrides.
- 3.22.48 A banking institution must have systems that identify overrides and separately track their nature and performance.

Data maintenance

- 3.22.49 A banking institution must collect and store data on key obligor and facility characteristics to, support its internal credit risk measurement and management processes, enable the banking institution to meet the requirements of this Guideline and, serve as a basis for regulatory reporting and the relevant disclosure requirements detailed in Guideline No. 1-2008/BSD: Minimum Disclosure Requirements.

Standards for the corporate, sovereign and bank IRB asset classes

- 3.22.50 A banking institution must maintain rating histories on obligors and eligible guarantors or credit protection providers including the initial rating, the dates the ratings were assigned, the methodology and key data used to derive the rating and the officer responsible for the most recent rating.

- 3.22.51 In order to track the predictive power of the obligor rating system, a banking institution must retain data on PD estimates, ratings migration and realised default rates associated with obligor grades.
- 3.22.52 A banking institution using the AIRB approach must collect and store a history of data on the LGD and EAD estimates associated with each facility, the methodology and key data used to derive the estimate, the officer responsible for the most recent rating and the realised rates associated with each defaulted facility.
- 3.22.53 Where a banking institution uses the AIRB approach and reflects the credit risk mitigating effects of guarantees through its LGD estimates, it must retain data on the LGD of the facility before and after evaluation of the effects of the guarantee.
- 3.22.54 A banking institution must retain the identity of obligors and facilities that default and information about the components of loss and recovery for each defaulted exposure including information relating to amounts and source of recoveries (e.g. collateral, liquidation proceeds and guarantees), timing of cash flows and administrative costs.
- 3.22.55 A banking institution using the slotting approach for one or more of the SL sub-asset classes is encouraged to retain data on realised losses for these exposures.

Standards for the retail IRB asset class

- 3.22.56 A banking institution must retain data used in the process of allocating retail exposures to pools. This includes data on obligor and transaction risk characteristics used either directly, or through the use of a model, as well as data on delinquency.
- 3.22.57 A banking institution must retain data on PD, LGD and EAD estimates associated with its pools of retail exposures.
- 3.22.58 For defaulted exposures, a banking institution must retain data on the pools to which the retail exposure was assigned over the year prior to default and the realised outcomes on LGD and EAD.

3.23 Stress tests in the assessment of capital adequacy

- 3.23.1 A banking institution must have in place sound stress testing processes for use in the assessment of its capital adequacy including the sufficiency of the IRB capital requirement. Stress testing must include identification of possible events or severe changes in economic

conditions that would have unfavourable effects on the banking institution's credit exposures and assessment of the banking institution's ability to withstand such events or changes. Scenarios that could be used for this purpose are economic or industry downturns, market-risk events and liquidity conditions.

- 3.23.2 As part of its capital management planning, a banking institution must also perform one or more credit risk stress tests to assess the effect of certain specific conditions on its IRB capital requirement. For this purpose, the objective is not to require the banking institution to consider worst-case scenarios; however, it should at least consider the effect of mild recession scenarios. The tests to be employed would be chosen by the banking institution, subject to review by the Reserve Bank. The tests must be meaningful and reasonably conservative. Depending on its own circumstances, the banking institution may develop different approaches to undertaking this stress test requirement.
- 3.23.3 As part of its stress testing process, a banking institution that uses the double default approach for certain exposures must consider the impact of a deterioration in the credit quality of the relevant guarantors and credit protection providers and, in particular, the impact of these parties falling outside the eligibility criteria due to a change in their rating. The banking institution must also consider the impact of the default of one, but not both, of the obligor and the guarantor or credit protection provider and the consequential increase in risk and its capital requirement at the time of that default.

3.24 Governance and oversight

- 3.24.1 All material aspects of a banking institution's rating and estimation processes must be approved by the banking institution's Board, or Board committee thereof, and senior management. Those parties must possess an understanding of the banking institution's rating systems and a detailed understanding of the associated management reports. Senior management must notify the Board, or committee thereof, of material changes or exceptions from established policies that could have a material impact on the banking institution's rating system.
- 3.24.2 Senior management must understand the design and operation of the banking institution's rating systems and approve any material differences identified between established procedures and actual practice. Senior management must ensure that the rating system is operating as intended on an ongoing basis. Senior management and staff in the credit risk control function

must meet regularly to discuss the performance of the rating process, areas requiring improvement and the status of efforts to improve previously identified deficiencies.

- 3.24.3 Internal ratings must be an essential part of the reporting to the Board and senior management. Reporting must include risk profile by grade, migration across obligor grades, quantitative estimates of the relevant parameters for each obligor grade and where relevant, facility grade, and comparison of realised default rates (and realised LGD and EAD rates where relevant) against expectations. Reporting frequencies may vary with the significance and type of information and the level of the recipients.

Credit risk control

- 3.24.4 A banking institution must have an independent credit risk control unit that is responsible for the design or selection, implementation and performance of the banking institution's rating systems. The unit must be functionally independent of the personnel and management functions responsible for originating exposures. Areas of responsibility must include:
- a) testing and monitoring internal obligor and facility grades;
 - b) production and analysis of summary reports from the banking institution's rating system, including historical default data sorted by rating at the time of default and one year prior to default, migration analysis and monitoring of trends in key rating criteria;
 - c) implementing procedures to verify that rating definitions are consistently applied across departments and geographic areas;
 - d) reviewing and documenting any changes to the rating process, including the reasons for those changes; and
 - e) reviewing the rating criteria to evaluate if they remain predictive of risk.
- 3.24.5 The 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 have ultimate responsibility for the ongoing review of, and alterations to, the banking institution's rating models.

Independent review

- 3.24.6 A banking institution's rating system and its operations, including the operations of the credit risk control function and the estimation of PD and, where relevant, LGD and EAD, must be reviewed at least annually by an independent function. This review must include adherence to all applicable minimum requirements detailed in this section. The findings of this review must be documented.
- 3.24.7 Internal ratings, loss, default and exposure estimates must play an integral role in the credit approval, risk management, internal capital allocation and governance functions of the banking institution. Rating systems and estimates designed and implemented exclusively for the purpose of qualifying for the IRB approach and used only to provide IRB inputs are not acceptable.
- 3.24.8 It is recognised that a banking institution may not necessarily be using the same credit risk estimates for both regulatory capital and economic capital purposes. In this case, data sources and methodologies utilised for the purposes of determining a banking institution's internal credit risk estimates must be consistent with the estimates used to determine the IRB capital requirement. Where there are differences, the banking institution must be able to justify, to the Reserve Bank's satisfaction, the reasonableness of those differences.

3.25 General risk quantification requirements

Overall requirements for estimation

- 3.25.1 A banking institution must estimate PD¹⁰ for each internal obligor grade for corporate, sovereign and bank exposures and for each pool of retail exposures.
- 3.25.2 PD estimates must be calibrated to a long-run average of one-year default rates (one-year PD) for obligors in each obligor grade, with the exception of retail exposures where the definition of default can be applied at the facility, rather than obligor, level. Additional requirements specific to PD estimation are detailed in paragraphs 3.26.1 to 3.26.8.
- 3.25.3 A banking institution must estimate an appropriate long-run default-weighted average LGD and EAD (as detailed in this guideline) for each relevant corporate, sovereign and bank exposure where the banking institution has approval from the Reserve Bank to use the AIRB approach; and each retail pool.

¹⁰ A banking institution is not required to produce its own estimates of PD for the SL sub-asset classes where the banking institution uses the slotting approach for these exposures.

- 3.25.4 Internal estimates of PD, LGD and EAD must be reviewed on at least an annual basis and incorporate all relevant, material and available data and other information. In determining these estimates, a banking institution may utilise internal data and relevant data from external sources (including pooled data).
- 3.25.5 Estimates must be grounded on historical experience and empirical evidence and not based purely on subjective or judgmental considerations. Changes in a banking institution's lending and collection practices over the observation period must be taken into account. The banking institution's estimates must reflect the implications of new data and other information as it becomes available. Where industry estimation practices evolve and improve over time, the banking institution should consider these developments in assessing its own practices. The banking institution must review its estimates and estimation methodology on at least an annual basis.
- 3.25.6 In general, PD, LGD and EAD estimates are likely to involve unpredictable errors. In order to avoid over-optimism, a banking institution must add a margin of conservatism to its estimates 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.

Definition of default

- 3.25.7 A default is considered to have occurred with regard to a particular obligor when either or both of the two following events have taken place:
- a) the banking institution considers that the obligor is unlikely to pay its credit obligations to the consolidated banking group in full, without recourse by the banking institution to actions such as realising available security;
 - b) the obligor is at least 90 days past due on a credit obligation to the consolidated banking group.¹¹
- 3.25.8 For the purposes of paragraph 3.25.7a, elements to be taken as indications of unlikelihood to pay include:

¹¹ An exception to this is for subsidiaries in jurisdictions where a different number of days past due is set for retail exposures by the national regulator. That definition may be used by the banking institution in relation to relevant PD, LGD and EAD estimates in the calculation of its capital requirement.

- a) the factors set out in this guideline relating to impairment irrespective of whether the banking institution considers the credit obligations to be well secured;
- b) the banking institution sells the credit obligation at a material credit-related economic loss. For the purpose of this element, the banking institution must have a policy requiring:
 - i. the maintenance of an internal register of credit obligations sold at a material credit-related economic loss;
 - ii. data contained in the register to be considered by the banking institution in its rating system design and validation processes. The subsequent inclusion in, or exclusion from, those processes of any data contained in the register must be justified by the banking institution and must not result in lower LGD estimates; and
 - iii. the creation and use of data contained in the register must be transparent to independent reviewers of the banking institution's rating systems, such as the banking institution's internal or external auditors and the Reserve Bank.

3.25.9 The criteria for the recognition of 90 days past due are the same as those detailed in this guideline.

3.25.10 A banking institution must record actual defaults on IRB asset classes using the reference definition of default detailed in this section. The banking institution must also use the reference definition of default for its PD and, where relevant, LGD and EAD estimates (though this does not preclude the possibility of materiality considerations entering into the estimation process). In arriving at its estimates, the banking institution may use external data that are not consistent with that definition provided it makes appropriate adjustments to the data to achieve broad equivalence with the reference definition of default.

3.25.11 If a banking institution considers that a previously defaulted exposure's status is such that the triggers in the reference definition of default no longer apply, the banking institution may re-rate the obligor grade and, where relevant, the facility grade, as they would for a non-defaulted exposure. Should the reference definition be subsequently triggered, a second default would be deemed to have occurred. In the case of a restructured item, that item may not be re-rated to a non-defaulted grade or rating until the restructured item has operated in accordance with non-concessional terms and conditions for a period of at least six months.

Re-aging

- 3.25.12 A banking institution must have clearly documented policies in respect of the counting of days past due and, in particular, in respect of the re-aging of facilities and the granting of extensions, deferrals, renewals and rewrites to existing accounts. These policies must be consistent with the requirements for the use of internal ratings set out in this section. Where the banking institution treats a re-aged exposure in a similar fashion to other exposures that are considered to be in default, that exposure must be recorded as defaulted for regulatory capital purposes.

Treatment of overdrafts and other revolving facilities

- 3.25.13 Non-authorized overdrafts are considered to have a zero limit for IRB purposes. A banking institution must, therefore, treat days past due as commencing once any credit is granted to an unauthorized customer and if such credit is not repaid within 90 days, the exposure must be considered to be in default.

3.26 Risk Quantification Requirements Specific to PD estimation

Standards for the corporate, sovereign and bank IRB asset classes

- 3.26.1 When estimating the average PD for each obligor grade, a banking institution must use information and techniques that take appropriate account of long-run experience. The banking institution may have a primary PD estimation technique and use others as a point of comparison and potential adjustment. The mechanical application of a technique without supporting analysis is not sufficient. A banking institution must recognise the importance of judgmental considerations in combining the results of techniques and in making adjustments for limitations of techniques and information.
- 3.26.2 Irrespective of the technique a banking institution uses for PD estimation, the length of the underlying historical observation period used must be at least five years and from at least one source. If the available observation period spans a longer period from any source, and the data are relevant and material, this longer period must be used.

Standards for the retail IRB asset class

- 3.26.3 Since a banking institution will have its own particular basis for assigning retail exposures to pools, the banking institution must regard internal data as the primary source of information for estimating loss characteristics for retail exposures. The banking institution may use other techniques for PD quantification provided a strong link can be demonstrated between:
- a. the banking institution's process of assigning retail exposures to a pool and the process used by the other data source; and
 - b. the banking institution's internal risk profile and the composition of the other data.
- 3.26.4 In all cases, the banking institution must use all relevant and material data sources as points of comparison.
- 3.26.5 One method for deriving long-run average estimates of PD (and default-weighted estimates of average LGD as defined in paragraph 3.27.6) for retail exposures would be based on an estimate of the expected long-run average loss rate. A banking institution may:
- a. use an appropriate PD estimate to infer the long-run default-weighted average LGD; or
 - b. use a long-run default-weighted average LGD to infer the appropriate PD.
- 3.26.6 In either case, the LGD used for the IRB capital calculation must not be less than the long-run default-weighted average LGD and must be consistent with the standards set out for IRB classes in this guideline.
- 3.26.7 Irrespective of the technique a banking institution uses for the estimation of loss characteristics of retail exposures, the length of the underlying historical observation period used must be at least five years. If the available observations from any source span a longer period, and the data are relevant, this longer period must be used. The banking institution need not give equal importance to historical data if it can demonstrate that the more recent data are a better predictor of loss rates.
- 3.26.8 A banking institution must anticipate the implications of rapid exposure growth and take steps to ensure that its estimation techniques are accurate and that its current capital level, earnings and funding prospects are adequate to cover its future capital needs. In order to avoid excessive movement in its required capital position arising from short-term PD horizons, the banking institution must adjust PD estimates upward for anticipated material seasoning effects that may peak several years after origination, provided such adjustments are applied in a consistent fashion over time.

3.27 Risk Quantification Requirements Specific to LGD Estimation under the Advanced IRB and Retail IRB Approaches

Definition of loss for loss given default estimates across all IRB asset classes

- 3.27.1 A banking institution must take into account all relevant factors when measuring economic loss for LGD purposes. This includes material discount effects and material direct and indirect costs associated with collecting on an exposure.
- 3.27.2 For LGD estimation purposes, a banking institution must not simply measure the loss recorded in its accounting records although it must be able to reconcile accounting and economic losses.
- 3.27.3 A banking institution may make adjustments to its LGD estimates to reflect its own workout and collection expertise. Such adjustments must be conservative until such time as the banking institution has sufficient internal empirical evidence of the impact of its expertise.

Standards for all IRB asset classes

- 3.27.4 A banking institution must take into account the potential for LGD to be higher than the default-weighted average during a period when credit losses are substantially higher than average. That is, LGD estimates must reflect economic downturn conditions, where necessary, to capture relevant risks.
- 3.27.5 For certain exposures, there may be significant cyclical variability in loss severities and a banking institution must incorporate this into its LGD estimates. For this purpose, a banking institution may use averages of loss severities observed during periods of high credit losses, forecasts based on appropriately conservative assumptions or other similar methods. Estimates of LGD during periods of high credit losses may be made using either internal or external data. In its analysis, the banking institution must consider the extent of any dependence between the risk of the obligor and that of the collateral or collateral provider. Cases where there is a significant degree of dependence must be addressed in a conservative manner.
- 3.27.6 Where loss severities do not exhibit cyclical variability and LGD estimates do not differ materially from the long-run default-weighted average, LGD estimates must not be less than the long-run default-weighted average loss given default calculated as the average economic loss of all observed defaults within the data source for that type of facility.
- 3.27.7 Currency mismatches between the underlying obligation and the collateral must be considered and treated conservatively in a banking institution's assessment of LGD.

- 3.27.8 LGD estimates must be grounded in historical recovery rates and, where applicable, must not be based solely on the estimated market value of collateral.
- 3.27.9 To the extent that LGD estimates take into account the existence of collateral, a banking institution must establish internal requirements for collateral management, operational procedures, legal certainty and risk management processes that are generally consistent with those detailed in this Guideline.
- 3.27.10 The LGD assigned to a defaulted asset must reflect the possibility that a banking institution may have to recognise additional UL during the recovery period. For each defaulted asset, the banking institution must also construct its best estimate of the EL on that asset based on current economic circumstances and the facility's status. The amount, if any, by which the LGD on a defaulted asset exceeds the banking institution's best estimate of EL on the asset represents the capital requirement for that asset and should be set by the banking institution on a risk-sensitive basis. Instances where the best estimate of EL on a defaulted asset is less than the sum of specific provisions and partial write-offs on that asset must be justified to the Reserve Bank by the banking institution.

Additional standards for the corporate, sovereign and bank IRB asset classes

- 3.27.11 Estimates of LGD for exposures in the corporate, sovereign and bank IRB asset classes must be based on a minimum data observation period that should ideally cover at least one complete economic cycle but, in any case, must be no shorter than a period of seven years from at least one source. If the available observation period spans a longer period from any source and the data are relevant and material, this longer period must be used.

Additional standards for the retail IRB asset class

- 3.27.12 The minimum data observation period for LGD estimates for retail exposures is five years. The less data a banking institution has, the more conservative it must be in its estimation of LGD. The banking institution need not give equal importance to historical data if it can demonstrate to the Reserve Bank that more recent data are a better predictor of loss rates.

3.28 Risk Quantification Requirements Specific to EAD Estimation under the Advanced IRB and Retail IRB Approaches

Standards for all IRB asset classes

- 3.28.1 A banking institution must have procedures in place for the estimation of EAD for each type of off-balance sheet exposure, excluding those that expose the banking institution to counterparty credit risk. Estimates of EAD should reflect the possibility of additional drawings by the obligor up to the time a default event is triggered. EAD estimates must also take into account additional drawings after the time of default if the banking institution does not include the possibility of such drawings in its LGD estimates. Where estimates of EAD differ by facility type, the delineation of these facilities must be clear and unambiguous.
- 3.28.2 A banking institution that has approval to use the AIRB approach must assign an estimate of EAD for each facility. EAD estimates must be an estimate of the long-run default-weighted average EAD for similar facilities and obligors over a sufficiently long period of time, 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.
- 3.28.3 For exposures where EAD estimates are volatile over the economic cycle, a banking institution must use EAD estimates that are appropriate for an economic downturn if these are more conservative than the long-run average. Where the banking institution has developed its own EAD models, this could be achieved by considering the cyclical nature, if any, of the drivers of such models. Alternatively, the banking institution may have sufficient internal data to examine the impact of previous recessions. In some cases, the banking institution may only have the option of making conservative use of external data.
- 3.28.4 The criteria by which estimates of EAD are derived must be plausible and intuitive and represent what a banking institution believes to be the material drivers of EAD. The criteria must be supported by credible internal analysis by the banking institution. The banking institution must be able to provide a breakdown of its EAD experience by the factors it sees as the drivers of EAD. The banking institution must use all relevant and material information in its determination of EAD estimates.
- 3.28.5 A banking institution must review assigned EAD estimates when material new information comes to light and, in any case, at least on an annual basis.
- 3.28.6 A banking institution's EAD estimates must give due consideration to its policies and procedures in respect of account monitoring and payment processing. The banking institution must consider its ability and willingness to prevent further drawings in circumstances short of payment default, such as covenant violations or other technical default events.

- 3.28.7 A banking institution must have systems and procedures in place to monitor, on a daily basis, facility amounts, outstanding amounts against committed lines and changes in outstanding amounts for each obligor and obligor grade.

Additional standards for the corporate, sovereign and bank IRB asset classes

- 3.28.8 Estimates of EAD must be based on a time period that must ideally cover a complete economic cycle but, in any case, must be no shorter than seven years. If the available observation period spans a longer period from any source and the data are relevant and material, this longer period must be used.

Additional standards for the retail IRB asset class

- 3.28.9 The minimum data observation period for EAD estimates for retail exposures is five years. The less data a banking institution has, the more conservative it must be in its estimation of EAD. The banking institution need not give equal importance to historical data if it can demonstrate to the Reserve Bank that more recent data are a better predictor of drawdowns.
- 3.28.10 A banking institution must have a robust and documented system in place to validate the accuracy and consistency of rating systems and processes and the estimation of all relevant credit risk components. The banking institution must be able to demonstrate to the Reserve Bank that the internal validation process enables it to assess the performance of its internal rating and credit risk estimation systems in a meaningful and consistent manner.
- 3.28.11 A banking institution must regularly compare realised default rates with PD estimates for each obligor grade and be able to demonstrate that the realised default rates are within the expected range for each grade. A banking institution using its own LGD and EAD estimates must also complete such analysis for those estimates. Comparisons must make use of historical data over as long a time period as possible. The methods and data used in these comparisons must be clearly documented. This analysis and documentation must be updated at least annually.
- 3.28.12 A banking institution 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. The banking institution's internal assessment of the performance of its rating system must be based on long

data histories covering a range of economic conditions and, ideally, one or more complete business cycles.

- 3.28.13 A banking institution 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.
- 3.28.14 A banking institution must have documented internal standards for situations where deviations from expectations in realised PD rates and, where applicable, LGD and EAD rates, 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 experience. Where realised values continue to be higher than expected values, the banking institution must revise its estimates upward to reflect its actual default and loss experience.
- 3.28.15 A banking institution that uses supervisory, rather than internal, estimates of credit risk parameters must compare realised LGD and EAD rates to those set by the Reserve Bank and use this information in its internal assessment of capital adequacy.

3.29 Disclosure requirements

- 3.29.1 A banking institution with IRB approval must meet the relevant disclosure requirements detailed in Guideline No. 1-2008/**BSD**: Minimum Disclosure Requirements.

3.30 Corporate, Sovereign and Bank IRB Asset Classes

PD Estimates

- 3.30.1 The minimum requirements for the derivation of the PD estimates associated with each internal obligor grade are detailed in section on Governance and Quantification requirements above.
- 3.30.2 For exposures in the corporate and bank IRB asset classes, PD is the greater of the one-year PD associated with the internal obligor grade to which an exposure is assigned and 0.03 per cent. For exposures in the sovereign IRB asset class, PD is the one-year PD associated with the internal obligor grade to which an exposure is assigned.
- 3.30.3 A 100 per cent PD must be assigned to default grades.

Loss given default estimates

Foundation IRB approach

3.30.4 Where a banking institution's IRB approval requires the use of the FIRB approach for the corporate, sovereign or bank IRB asset classes (or for certain exposures within those IRB asset classes), the banking institution must use supervisory estimates for the LGD credit risk component as summarized in Table 2.

Table 14 Supervisory estimates for LGD

	Minimum LGD (%)	Level of collateralisation required for full recognition of collateral (C**) ¹² (%)	Minimum level of collateralisation required for partial recognition of collateral (C*) ¹³ (%)
Senior unsecured claims	45		
Subordinated claims	75		
Eligible financial collateral	0		0
Commercial or residential real estate	35	140	30
Eligible financial receivables	35	125	0

Senior unsecured claims

3.30.5 Senior claims that are not secured by eligible collateral must be assigned a 45 per cent LGD.

Subordinated claims

3.30.6 With the exception of junior liens over commercial real estate (CRE) and residential real estate (RRE), subordinated claims must be assigned a 75 per cent LGD.

Claims secured by eligible financial collateral

¹² Refer to section dealing with the methodology for the recognition of commercial real estate, residential real estate and eligible financial receivables collateral.

¹³ Refer to relevant section for the methodology for the recognition of eligible financial collateral.

- 3.30.7 Eligible financial collateral is limited to the eligible collateral defined in this guideline and recognition of eligible financial collateral is subject to the minimum conditions detailed in this same guideline.
- 3.30.8 The effective loss given default (LGD*) applicable to a transaction secured by eligible financial collateral is determined as follows:

$$LGD^* = LGD \times \frac{E^*}{E}$$

Where:

LGD = a senior unsecured exposure before recognition of collateral (i.e. 45 per cent);

E = the current value of the exposure (i.e. cash or securities lent or posted); and

E* = the exposure value after credit risk mitigation (CRM) as determined under the comprehensive approach to the recognition of collateral.

- 3.30.9 The methodology detailed in paragraph 3.30.8 may only be used to calculate LGD. A banking institution must determine EAD without taking into account the effect of collateral.
- 3.30.10 Where repurchase, reverse repurchase and securities borrowing or lending transactions are subject to a master netting agreement, a banking institution may recognise netting subject to satisfying the criteria detailed in this guideline. The LGD estimate must not include the impact of collateral.

Claims Secured By Commercial or Residential Real Estate

- 3.30.11 CRE and RRE collateral for exposures in the corporate, sovereign and bank IRB asset classes is limited to:
- collateral where the risk of the obligor defaulting is not materially dependent upon the performance or cash flow of the underlying property or project but rather on the underlying capacity of the obligor to repay the debt from other sources; and
 - collateral where the value of such collateral is not materially dependent upon the performance of the obligor. 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 obligor.

- 3.30.12 Under the FIRB approach, income-producing real estate that falls under the SL sub-asset class is excluded from recognition as eligible collateral for exposures in the corporate IRB asset class.
- 3.30.13 Subject to paragraph 3.30.11, CRE and RRE are eligible for recognition as collateral when the following requirements are met:

- a) claims on collateral are legally enforceable in all relevant jurisdictions and legal requirements for establishing the banking institution's claim are fulfilled. The collateral agreement and the legal process underpinning the transaction must allow the banking institution to realise the value of the collateral within a reasonable timeframe;
- b) the collateral is valued at no more than the current fair value under which it could be sold under contract between a willing seller and an independent buyer on the date of valuation;
- c) the banking institution monitors the value of the collateral on at least an annual basis. More frequent monitoring is required where the market is subject to significant changes in value;
- d) junior liens may be taken into account where there is no doubt that the claim for collateral is legally enforceable and constitutes an effective credit risk mitigant. Junior liens are to be treated using the C^*/C^{**} threshold set out in Table 2. In such cases, C^* and C^{**} are calculated by taking into account the sum of amounts secured by the junior lien and all senior liens;
- e) the banking institution's lending policies clearly document the types of CRE and RRE collateral that are acceptable to the banking institution. Exceptions to the banking institution's policy will not be recognised as eligible CRE and RRE under the FIRB approach;
- f) the banking institution ensures that the property taken as collateral is adequately insured;
- g) the banking institution monitors and takes into account prior claims (e.g. taxation liabilities) on the property; and
- h) the banking institution monitors the risk of environmental liability arising in respect of the collateral.
- i) Where a banking institution has taken CRE or RRE as collateral, the methodology for determining LGD* is as follows:
- j) where the level of collateralisation (C) exceeds the threshold level of C^{**} detailed in Table 2, LGD* is 35 per cent;
- k) where the level of collateralisation is between the threshold levels C^{**} and C^* detailed in Table 2, the exposure is divided into fully collateralised and uncollateralised

portions. That part of the exposure considered to be fully collateralised (C/C^{**}) is assigned a supervisory LGD estimate of 35 per cent. The remaining part of the exposure is regarded as unsecured and is assigned an LGD of 45 per cent. That is:

$$LGD^* = \left(\frac{C}{C^{**}} \right) \times 35\% + \left(1 - \frac{C}{C^{**}} \right) \times 45\% \quad ; \text{ and}$$

Where the level of collateralization is below the threshold level of C^* detailed in Table 2, the collateral is not recognized, i.e. LGD^* is 45 per cent.

Claims Secured by Eligible Financial Receivables

3.30.14 Eligible financial receivables are limited to claims with an original maturity of one year or less where repayment occurs through the commercial or financial flows related to the obligor's underlying business operations. This includes:

- a) self-liquidating debt arising from the sale of goods or services linked to a commercial transaction; and
- b) general amounts owed by buyers, suppliers, renters, national and local government authorities or other non-affiliated parties that are not related to the sale of goods or services linked to a commercial transaction.

3.30.15 Receivables from affiliates of the obligor (including subsidiaries and employees) and receivables associated with securitisations, sub-participations will not be recognised as eligible financial receivables under the FIRB approach.

3.30.16 Subject to paragraph 3.30.14, financial receivables are eligible for recognition as collateral only where the banking institution has a first priority claim and when the following operational requirements are met:

- a) claims on collateral are legally enforceable in all relevant jurisdictions and legal requirements for establishing the banking institution's claim are fulfilled. The banking institution must be able to realise the collateral within a reasonable timeframe. The banking institution's procedures must 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 banking institution must have the legal authority to sell or assign the receivables to other parties without the consent of the receivables' obligors;
- b) the banking institution assesses the credit risk of the financial receivables taken as collateral. The margin between the amount of the exposure and the value of the receivables must reflect the cost of collection and the concentration within the receivables pool and across the banking institution's total exposures;
- c) the banking institution maintains a continuous monitoring process over the financial receivables taken as collateral;
- d) the banking institution has concentration limits that it monitors; and
- e) the banking institution has a documented process for collecting cash remittances from the receivables' obligor in the event of the obligor's distress or bankruptcy. The requisite facilities for collection should be in place, even though the banking institution would normally look to the obligor for collections.

3.30.17 The methodology for determining LGD* for exposures secured by eligible financial receivables under the FIRB approach is the same as that detailed in paragraph 3.30.8.

3.30.18 In the case where a banking institution has multiple forms of eligible collateral for an exposure, the exposure must be divided into portions fully covered by eligible financial collateral, eligible financial receivables and a residual portion (which may be fully or partly secured by CRE and RRE). The risk-weights for each portion must be calculated separately. In the case of the residual portion, where the ratio of the sum of the value of CRE and RRE to the residual exposure is below the associated level of C* detailed in Table 2, the exposure must be assigned an LGD value of 45 per cent.

3.31 *Advanced IRB approach*

3.31.1 Where a banking institution's IRB approval allows the use of the AIRB approach for the corporate, sovereign or bank IRB asset classes (or for certain exposures within those IRB asset

classes), the banking institution may use its own estimates of LGD. These estimates must meet the requirements detailed in this section. Notwithstanding, a minimum LGD of 10 per cent must be applied to exposures to the extent they are secured by RRE. Where considered appropriate, the Reserve Bank may, in writing, require a banking institution to meet a higher minimum LGD for such exposures.

- 3.31.2 Where repurchase, reverse repurchase and securities borrowing or lending transactions are subject to a master netting agreement, a banking institution may recognise netting subject to satisfying the criteria detailed in this guideline. In this case, the banking institution must calculate E* and use this as the estimate of EAD. The banking institution may use its own LGD estimate for the unsecured equivalent amount (i.e. E*).
- 3.31.3 LGD estimates must be measured as a percentage of EAD.

EAD Estimates

- 3.31.4 EAD in respect of each exposure (both on-balance sheet and off-balance sheet) is measured gross of specific provisions and partial write-offs.

Exposure Measurement for On-Balance Sheet Exposures

- 3.31.5 Subject to paragraph 3.31.7, the EAD estimate of a drawn amount (i.e. an on-balance sheet exposure) must not be less than the contractual amount owed by the obligor at the time of default nor should it be less than the sum of:
- a) the amount by which the banking institution's tier 1 capital would be reduced if the exposure were fully written-off; and
 - b) any associated specific provisions and partial write-offs.
- 3.31.6 When the difference between the EAD estimate and the sum of paragraph 185 is positive, this amount is termed a discount. A banking institution must not take into account such discounts when calculating risk-weighted assets. However, such discounts may be included in the measurement of eligible provisions for the purpose of offsetting EL in calculating the banking institution's capital requirement.
- 3.31.7 A banking institution may recognise on-balance sheet netting of loans and deposits subject to satisfying the criteria detailed in this guideline. Where there is a currency or maturity mismatch between the relevant loans and deposits, adjustments must be made in the same manner as those detailed in the comprehensive approach to the recognition of collateral.

Exposure Measurement for Off-Balance Sheet Exposures except Those That Expose the banking institution to Counterparty Credit Risk

- 3.31.8 For off-balance sheet exposures, EAD is calculated as the notional amount of the exposure multiplied by a Credit Conversion Factor (CCF) or, in the case of an undrawn commitment, the undrawn amount multiplied by a CCF. There are two approaches for the estimation of CCFs: a FIRB approach and an AIRB approach.

Foundation IRB approach

- 3.31.9 Where a banking institution's IRB approval requires the use of the FIRB approach for the corporate, sovereign or bank IRB asset classes (or for certain exposures within those IRB asset classes), the banking institution must use the CCFs for off-balance sheet exposures. The exception to this is that a 100 per cent CCF must be applied to commitments, note issuance facilities and underwriting facilities regardless of the maturity of the underlying facility. In the case of commitments that are provided to obligors that have access to debt securities markets in their own name (i.e. not solely through securitisation transactions), the banking institution may apply a 75 per cent CCF.
- 3.31.10 In order for a banking institution to apply a zero per cent CCF for unconditionally cancellable commitments, the banking institution must be able to demonstrate that it actively monitors the financial condition of the obligor and that its internal control system is such that upon evidence of a material deterioration in the credit quality of the obligor, the banking institution can, and usually would, cancel the facility.
- 3.31.11 CCFs may be applied to the lower of the value of the unused committed credit line and the value of any other constraining factor on the availability of the facility, such as the existence of a ceiling on the potential lending amount that is related to an obligor's reported cash flow or its external credit rating. If the lower value is used, the banking institution must have sufficient line monitoring and management procedures to support using the lower value for regulatory capital purposes.

- 3.31.12 Where the banking institution has given a commitment to provide an off-balance sheet exposure, it may apply the lower of the CCFs applicable to the commitment and the off-balance sheet exposure.
- 3.31.13 Where a banking institution's IRB approval allows the use of the AIRB approach for the corporate, sovereign or bank IRB asset classes (or for certain exposures within those IRB asset classes), the banking institution may use its own CCF estimates. The exception to this is for those exposures subject to a CCF of 100 per cent under the standardised approach to credit risk.

Exposure Measurement for Off-Balance Sheet Exposures That Expose the banking institution to Counterparty Credit Risk

- 3.31.14 Under both the FIRB and AIRB approaches, a banking institution must determine EAD for those off-balance sheet exposures that expose the banking institution to counterparty credit risk using the methods set in this guideline for calculating credit equivalents for off balance sheet exposures.

Maturity

- 3.31.15 For exposures in the corporate, sovereign and bank IRB asset classes, the banking institution must measure M for each facility. Except as noted in paragraph 3.31.17, M is the greater of one year and the remaining maturity in years as defined in paragraph 3.31.17. In all cases, M is no greater than five years.
- 3.31.16 For an exposure subject to a specified cash flow schedule, M is defined as:

$$M = \frac{\sum_t t \times CF_t}{\sum_t CF_t}$$

where:

CF_t denotes the cash flows contractually payable by the obligor in period t and t is expressed in years (e.g. where a payment is due to be received in 18 months, t = 1.5).

- 3.31.17 A banking institution that is not able to calculate M for the contracted payments, may use a more conservative measure that is not less than the maximum remaining time (in years) that the obligor is permitted to take to fully discharge its contractual obligations under the terms of the facility agreement (up to a maximum of five years).

3.31.18 Where amounts have been drawn by an obligor under a committed facility and the maturity of the drawn amount is less than the maturity of the facility, the maturity of the facility (up to a maximum of five years) must be used for determining the capital requirement.

Exemptions from the One-Year Maturity Floor

3.31.19 For certain short-term exposures, the one-year floor for maturity that is set out in paragraph 3.31.15 may be replaced by a one-day floor. The maturity of such transactions must be calculated as the greater of one day and the maturity as detailed in paragraph 3.31.17.

3.31.20 Repurchase agreements, reverse repurchase agreements and securities lending and borrowing transactions are exempt from the one-year maturity floor where they have an original maturity of less than one year and the relevant documentation contains daily remargining clauses. The relevant documentation must also require daily revaluation and include provisions that allow for the prompt liquidation or setoff of collateral in the event of default or failure to remargin. Where these transactions are subject to a master netting agreement, the weighted-average maturity of the transactions should be used when determining the maturity estimate. In this case, the floor for repurchase agreements, reverse repurchase agreements and securities lending and borrowing transactions, it is five business days. The notional amount of each transaction must be used in determining the weighted-average maturity.

3.31.21 Other short-term transactions with an original maturity of less than one year that are not part of a banking institution's ongoing financing of an obligor may be exempt from the one-year maturity floor. This would include unsettled transactions that are required to be treated as an exposure. A banking institution must have policies that are detailing the transactions where the one-day maturity floor is appropriate.

3.32 Recognition of Guarantees

3.32.1 There are three approaches for the recognition of CRM in the form of guarantees under the IRB approach: a FIRB substitution approach where a banking institution uses supervisory estimates of LGD, an AIRB substitution approach where the banking institution has approval from the Reserve Bank to use its own estimates of LGD and, for certain exposures, a double default approach. A banking institution may decide, separately for each eligible exposure, to apply either the relevant substitution approach or the double default approach.

- 3.32.2 Under either of the two substitution approaches, CRM in the form of a guarantee or a credit derivative must not result in an adjusted risk-weight that is less than that of a comparable, direct exposure to the guarantor or credit protection provider.
- 3.32.3 Where there is partial coverage of an exposure by a guarantee and there is a difference in seniority between the covered and uncovered portions of the exposure, the arrangement is considered to be a synthetic securitisation.
- 3.32.4 A banking institution must have documented criteria for adjusting PD and, where relevant, LGD estimates to reflect the impact of guarantees under the substitution approaches. These criteria must be consistent with the requirements for assigning exposures to obligor grades and must follow the minimum requirements for assigning obligor or facility grades set out in this guideline. The banking institution's adjustment criteria must be plausible and intuitive and address the guarantor or credit protection provider's ability and willingness to perform under the guarantee. The adjustment criteria must also address the likely timing of any payments and the degree to which the guarantor or credit protection provider's ability to perform under the guarantee is correlated with the obligor's ability to repay. A banking institution's adjustment criteria must also consider the extent to which residual risks remain. In adjusting PD and, where relevant, LGD estimates a banking institution must take all relevant material information into account.
- 3.32.5 Where there is a currency mismatch between the underlying obligation and the credit protection provided by a guarantee, the amount of the exposure covered by the guarantee must be adjusted according to the requirements set out in this guideline.
- 3.32.6 A banking institution may choose not to recognise credit protection if doing so would result in a higher capital requirement.
- 3.32.7 In calculating the capital requirement for a covered exposure (or that portion thereof), the maturity estimate must be the same as the maturity of the exposure as if it were not covered.
- 3.32.8 Under the FIRB and AIRB substitution approaches, a banking institution must use the same PD, LGD and EAD estimates for calculating EL for exposures (or that portion thereof) covered by eligible guarantees as it uses for calculating the capital requirement for UL. EL for the covered portion of eligible exposures subject to the double default approach is zero.

Foundation IRB substitution approach

- 3.32.9 To receive recognition of guarantees under the FIRB substitution approach, the operational and other requirements for guarantees and credit derivatives as set out in this guideline must be met.
- 3.32.10 The range of eligible guarantors and credit protection providers under the FIRB substitution approach is the same as that for guarantees as detailed in this guideline, except that corporate counterparties that are internally rated and associated with a PD equivalent to a long-term external rating grade of two or better may also be recognised.
- 3.32.11 Eligible guarantees are recognised under the FIRB substitution approach as follows:
- a) for the covered portion of the exposure, a risk-weight may be derived by using the PD appropriate to the guarantor or credit protection provider's obligor grade (subject to the floor detailed in paragraph 3.30.2) or some grade between that of the underlying obligor and the guarantor or credit protection provider if the banking institution deems that full substitution is not warranted. In this case, the capital requirement will be based on the risk-weight function appropriate to the guarantor or credit protection provider. The banking institution may, in respect of the covered portion, replace the LGD of the underlying transaction with the LGD applicable to the guarantee taking into account its seniority and any eligible collateral; and
 - b) the uncovered portion of the exposure is assigned a risk-weight that is calculated in the same manner as a direct exposure to the underlying obligor.
- 3.32.12 Where the guarantee provides for a materiality threshold on payments below which no payment will be made in the event of loss, this is equivalent to a retained first loss position and must be deducted 50 per cent from Tier 1 capital and 50 per cent from Tier 2 capital of the banking institution obtaining credit protection. The deduction will be capped at the amount of capital the banking institution would be required to hold against the full value of the underlying exposure.
- 3.32.13 Where there is partial coverage of an exposure by a guarantee and the covered and uncovered portions are of equal seniority (i.e. the banking institution and the guarantor or credit protection provider share losses on a pro rata basis), capital relief will be afforded on a proportional basis. This means that the covered portion of the exposure will receive the treatment applicable to eligible guarantees with the remainder treated as uncovered.

Additional Minimum Requirements for Assessing the Effect of Guarantees under the

Foundation IRB Substitution Approach

3.32.14 Guarantees that prescribe conditions under which the guarantor may not be obliged to perform (conditional guarantees) may not be recognised under the FIRB substitution approach.

Advanced IRB substitution approach

3.32.15 There are no in-principle restrictions to the types of guarantors that a banking institution may recognise under the AIRB substitution approach. The banking institution must, however, have clearly documented criteria for the types of guarantors it will recognise for regulatory capital purposes.

3.32.16 Under the AIRB substitution approach, guarantees must be:

- a) in writing and non-cancellable on the part of the guarantor;
- b) in force until the debt is satisfied in full (to the extent of the amount and tenor of the guarantee); and
- c) legally enforceable against the guarantor in a jurisdiction where that party has assets to attach and enforce a judgement.

3.32.17 A banking institution using the AIRB substitution approach may reflect the risk-mitigating effect of guarantees by either adjusting PD or LGD estimates. Whether adjustments are made through PD or LGD, they must be made in a consistent manner for a given type of guarantee. Where adjustments are made to PD estimates, the approach to determining regulatory capital for the covered and uncovered portions must be applied.

Additional Minimum Requirements for Assessing the Effect of Guarantees under the Advanced IRB Substitution Approach

3.32.18 Guarantees prescribing conditions under which the guarantor may not be obliged to perform (conditional guarantees) may be recognised where the banking institution can demonstrate to the Reserve Bank that its criteria for assigning adjusted PD or LGD estimates adequately address any potential reduction in the CRM effect.

Double default approach

3.32.19 Subject to meeting the operational criteria detailed in paragraph 3.32.21, a banking institution may use the double default approach in determining the capital requirement for certain covered exposures.

3.32.20 Subject to the operational criteria detailed in paragraph 3.32.21, single-name guarantees are eligible for recognition under the double default approach.

3.32.21 A banking institution may use the double default approach for an exposure covered by a guarantee where the following operational criteria are met:

- a) the risk-weight that is associated with the exposure prior to the application of the double default approach does not reflect any aspect of the credit protection provided by the guarantee;
- b) the entity providing the credit protection is a sound local or international banking institution, investment firm or insurance company.¹⁴ These counterparties are collectively referred to as financial firms and must:
 - (i) be subject to the same prudential requirements as banking institution's (including capital adequacy, supervisory oversight and disclosure requirements) or alternatively, subject to satisfying paragraph 3.32.21b)(ii), have a credit rating grade of three or lower provided by an external credit assessment institution;
 - (ii) in order to initially qualify as an eligible guarantor or credit protection provider, have an internal rating that is equivalent to a credit rating grade of two or lower; and
 - (iii) subsequent to initial recognition as an eligible guarantor or credit protection provider, not have an internal rating that is equivalent to a credit rating grade of four or higher;

3.32.22 The underlying exposure that is covered by the guarantee is:

- (i) with the exception of exposures that are subject to the slotting approach, an exposure in the corporate IRB asset class; or
- (ii) a claim on a commercial public sector entity or a claim on local governments or non commercial public sector entities domiciled in Zimbabwe and overseas.
- (iii) the underlying obligor is not a financial firm or a member of the same group as the guarantor or credit protection provider;
- (iv) the credit protection provided by the guarantee meets the minimum operational requirements for guarantees and credit derivatives ;

¹⁴ To be recognised as an eligible credit protection provider, the insurance company must be in the business of providing credit protection. This would include insurance companies whose sole business line is providing credit protection, reinsurers and commercial export credit agencies (that is, export credit agencies that do not benefit from any direct or indirect sovereign support).

- (v) the banking institution has the right to receive payment from the guarantor or credit protection provider without having to take legal action in order to pursue the counterparty for payment;
- (vi) the credit protection provided by the guarantee absorbs all credit losses incurred on the covered portion of the exposure that arise due to the credit events detailed in the contract between the parties;
- (vii) if the payout structure of the credit protection provides for physical settlement, the banking institution has legal certainty with respect to the deliverability of a loan, bond or contingent liability. If the banking institution intends to deliver an obligation other than the underlying exposure, it must ensure that the deliverable obligation is sufficiently liquid so that the banking institution has the ability to purchase it for delivery in accordance with the contract;
- (viii) the terms and conditions of the credit protection contract are legally confirmed in writing by both the guarantor or credit protection provider and the banking institution;
- (ix) in the case of credit protection against dilution risk for purchased receivables, the seller of the purchased receivables is not a member of the same group as the guarantor or credit protection provider; and
- (x) there is no excessive correlation between the creditworthiness of the guarantor or credit protection provider and the obligor of the underlying exposure due to their performance being dependent on common factors beyond the systematic risk factor. The banking institution must have procedures in place to detect such excessive correlation.

3.32.23 The calculation of risk-weighted assets for a covered exposure under the double default approach is determined by the risk-weight function.

3.33 Treatment of Maturity Mismatches

3.33.1 Maturity mismatches between the residual maturity of the term of lodgement of collateral and the maturity of the exposure covered by the collateral are defined and adjusted according to the requirements set out in this guideline for the recognition of collateral.

3.33.2 Under the substitution and double default approaches, maturity mismatches between the residual maturity of a guarantee and the maturity of the exposure covered by the guarantee are defined and adjusted according to requirements set out for the recognition of guarantees set out in this guideline.

Risk-weight function

- 3.33.3 Except where (and to the extent that) the slotting approach applies to SL exposures, the derivation of risk-weighted assets in respect of UL for exposures in the corporate, sovereign and bank IRB asset classes is dependent on the assigned estimates of PD, LGD,¹⁵ EAD and M for a given exposure.
- 3.33.4 In calculating risk-weighted assets, PD and LGD are expressed as decimals (e.g. one per cent = 0.01) and EAD is expressed in local functional currency.
- 3.33.5 Except where (and to the extent that) the double default approach applies, for non-defaulted exposures in the corporate, sovereign and bank IRB asset classes, the risk-weight function is:
- 3.33.6 The capital requirement (K) in respect of UL for defaulted exposures under the AIRB approach is equal to the greater of zero and the amount by which the product of the banking institution's own estimates of LGD (expressed in percentage terms) and EAD (expressed in dollar terms) exceeds its best estimate of EL given current economic circumstances and the facility's status.
- 3.33.7 The capital requirement (K) in respect of UL for defaulted exposures under the FIRB approach is zero.
- 3.33.8 For both non-defaulted and defaulted exposures, risk-weighted assets for UL are calculated as $K \times 12.5 \times EAD$.

Firm-size adjustment

- 3.33.9 Where obligors form part of a corporate group that has reported consolidated annual sales of less than \$50 million, an adjustment may be made to the corporate risk-weight function by substituting the following correlation formula for that in paragraph 3.33.5:

Correlation (**R**)

$$= 0.12 \times \left(\frac{1 - e^{-50PD}}{1 - e^{-50}} \right) + 0.24 \times \left[1 - \left(\frac{1 - e^{-50PD}}{1 - e^{-50}} \right) \right] - 0.04 \times \left(1 - \frac{S - 5}{45} \right)$$

¹⁵ In the case of eligible collateral under the FIRB approach, effective LGD (**LGD***) as detailed in paragraphs 8, 14 and 17, is the LGD estimate that must be used in the risk-weight function in paragraph 76 of this Attachment.

where:

S is expressed as total annual sales between \$5 million and \$50 million. For obligors with reported sales of less than \$5 million, S has a minimum value of \$5 million.

- 3.33.10 As a failsafe, a banking institution may substitute total assets of the consolidated corporate group for total sales in calculating the firm-size adjustment. Total assets should be used only when the total sales figure is not a meaningful indicator of firm size and the banking institution has policies that have been approved in writing by the Reserve Bank detailing the circumstances where this is appropriate.

Slotting Approach for Specialised Lending Exposures

- 3.33.11 Where a banking institution's IRB approval provides for the slotting approach to apply to one or all of the SL sub-asset classes, the banking institution must map its internal rating grades for those exposures to the five slotting categories of *strong*, *good*, *satisfactory*, *weak* and *default*. Each slotting category is associated with a specific risk-weight for UL that broadly corresponds to a range of external credit assessments as detailed in Table 3 below.

Table 3: Risk-weights for UL under the slotting approach

Supervisory category	Strong	Good	Satisfactory	Weak	Default
Risk-weight	70%	90%	115%	250%	0%
External rating equivalent	BBB- or better	BB+ or BB	BB- or B+	B to C	N/A

- 3.33.12 For each SL exposure the banking institution must calculate the credit risk-weighted asset amount. For the on-balance sheet component, the amount that is multiplied by the relevant risk-weight is the book value of the exposure gross of any specific provisions. Off-balance sheet exposures are converted to on-balance sheet equivalents using the FIRB credit conversion factors detailed in this section. The total amount of the on-balance sheet exposure and on-balance sheet equivalent of any off-balance sheet exposure is multiplied by the relevant risk-weight to determine the credit risk-weighted asset amount.

Risk-Weighted Assets for Covered Exposures under the Double Default Approach

3.33.13 The risk-weight function in respect of UL for the covered portion of nondefaulted^{16,17,18} eligible exposures subject to the double default approach is:

$$K_{DD} = K_o \times (0.15 + 160PD_g)$$

$$K_o = \left[LGD_{DD} \times N \left(\frac{G(PD_o) + \sqrt{\rho_{os}} \times G(0.999)}{\sqrt{1 - \rho_{os}}} \right) - PD_o \times LGD_{DD} \right] \times \left(\frac{1 + (M - 2.5) \times b}{1 - 1.5 \times b} \right)$$

where:

K_{DD} = capital requirement for a covered exposure subject to the double default approach

PD_g = PD of the guarantor

PD_o = PD of the obligor

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

LGD_{DD} = the LGD associated with an unhedged facility to the guarantor or the unhedged facility of the obligor, depending upon whether, in the event both the guarantor and obligor default during the life of the hedged transaction, available evidence and the structure of the guarantee indicate that the amount recovered would depend upon the financial condition of the guarantor or obligor, respectively. In estimating the relevant LGD, the banking institution may recognize collateral against the exposure in a manner consistent with the general FIRB or AIRB approach as appropriate. There must be no consideration of double recovery in the LGD estimate¹⁹.

3.33.14 Correlation (ρ_{os}) in the risk-weight function in paragraph 3.33.13) is calculated according to the formula for correlation (R) set out in paragraph 3.33.5 or, in the case where the exposure is to an obligor that forms part of a corporate group that has reported consolidated annual sales of

¹⁶ In calculating risk-weighted assets, PD and LGD are expressed in decimals (e.g. one per cent = 0.01) and EAD is expressed in dollars.

¹⁷ The capital requirement for the uncovered portion of the exposure is determined as per the corporate IRB risk-weight function detailed in this section or in the case of small-business exposures included in the retail IRB asset class, the other retail IRB risk-weight function.

¹⁸ $G(z)$ denotes the inverse cumulative distribution function for a standard normal random variable.

¹⁹ Use of supervisory or own-estimates of LGD will depend upon a banking institution's use of the foundation or advanced IRB approach for its corporate exposures.

less than \$50 million, as per the formula in paragraph 3.33.9. In this case, PD is that of the protection provider.

- 3.33.15 The maturity adjustment coefficient (b in the risk-weight function in paragraph 3.33.5) is calculated according to the formula for the maturity adjustment (b) in paragraph 3.33.5, with PD being the lesser of the PD assigned to the obligor or the guarantor/credit protection provider.
- 3.33.16 Risk-weighted assets for UL are calculated as $KDD \times 12.5 \times EAD$. In this case, EAD must be set equal to the protection amount of the guarantee (adjusted for any maturity or currency mismatch).

3.34 Retail IRB Asset Class

PD and LGD Estimates...

- 3.34.1 The minimum requirements for the derivation of PD and LGD estimates associated with each identified pool of retail exposures are detailed in paragraphs 3.22.1 to 3.29.1.
- 3.34.2 The PD assigned to each pool of retail exposures is the greater of the one-year PD associated with the internal obligor grade to which the pool of retail exposures is assigned and 0.03 per cent.
- 3.34.3 A 100 per cent PD must be assigned to default grades and a minimum LGD of 10 per cent must be applied to exposures in the residential mortgage sub-asset class. Where considered appropriate, the Reserve Bank may require a banking institution to meet a higher minimum LGD for exposures in the residential mortgage sub-asset class.
- 3.34.4 LGD estimates must be measured as a percentage of EAD.

EAD estimates

- 3.34.5 The EAD in respect of each exposure (both on-balance sheet and off-balance sheet) is measured gross of specific provisions and partial write-offs.

Exposure measurement for on-balance sheet exposures

- 3.34.6 The EAD estimate of a drawn amount (i.e. an on-balance sheet exposure) must not be less than the contractual amount that would be owed by the obligor at the time of default, nor should it be less than the sum of:

- a) the amount by which the banking institution's Fundamental Tier 1 capital would be reduced if the exposure were fully written-off; and
 - b) any associated specific provisions and partial write-offs.
- 3.34.7 When the difference between the EAD estimate and the sum of paragraph 245 is positive, this amount is termed a discount. A banking institution must not take into account such discounts when calculating risk-weighted assets. As detailed in paragraph 3.19.17, such discounts may be included in the measurement of eligible provisions for the purpose of offsetting EL in calculating the banking institution's capital requirement.

Exposure measurement for off-balance sheet exposures except those that expose the banking institution to counterparty credit risk

- 3.34.8 For off-balance sheet exposures, EAD is calculated as the notional amount of the exposure multiplied by a CCF or, in the case of an undrawn commitment, the undrawn amount multiplied by a CCF.
- 3.34.9 Subject to the minimum requirements detailed in paragraphs 3.28.1 to 3.28.7 and 3.28.9, a banking institution may use its own internal estimates of CCFs for exposures in the retail IRB asset class.
- 3.34.10 For retail exposures with uncertain future drawdown such as credit cards, a banking institution must take into account its history and expectation of additional drawings prior to default in the overall calibration of its loss estimates. Where the banking institution does not reflect the likelihood of additional drawings in undrawn lines prior to default in its CCF estimates, and hence EAD estimates, it must do so in its LGD estimates.
- 3.34.11 Where a banking institution securitises the drawn balances, and only the drawn balances, of exposures in the retail IRB asset class, it must ensure that it continues to hold regulatory capital against its share (i.e. the seller's interest) of undrawn balances related to the securitised exposures. For such facilities, the banking institution must reflect the impact of CCFs in its EAD estimates rather than in its LGD estimates. For determining EAD associated with the seller's interest in the undrawn lines, the undrawn balances of securitised exposures are allocated between the seller's and investors' interests on a pro rata basis, based on the proportions of the seller's and investors' interests in the securitised drawn balances.

Exposure measurement for off-balance sheet exposures that expose the banking institution to

counterparty credit risk

3.34.12 A banking institution must determine EAD for those off-balance sheet exposures that expose the banking institution to counterparty credit risk.

Recognition of Guarantees

3.34.13 There are two approaches for the recognition of CRM in the form of guarantees under the retail IRB approach: a substitution approach and, for certain exposures, a double default approach. A banking institution may decide separately for each eligible exposure to apply either the substitution approach or the double default approach.

3.34.14 Where there is partial coverage of an exposure by a guarantee and there is a difference in seniority between the covered and uncovered portions of the exposure, the arrangement is considered to be a synthetic securitisation.

3.34.15 Where there is a currency mismatch between the underlying obligation and the credit protection provided by a guarantee, the amount of the exposure covered by the guarantee must be adjusted according to the requirements detailed in paragraph 3.16.87.

3.34.16 A banking institution may choose not to recognise credit protection if doing so would result in a higher capital requirement.

3.34.17 Under the substitution approach, a banking institution must use the same PD, LGD and EAD estimates for calculating EL for exposures (or that portion thereof) covered by eligible guarantees as it uses for calculating the capital requirement for UL. EL for the covered portion of eligible exposures subject to the double default approach is zero.

Substitution approach

3.34.18 Under the substitution approach, CRM in the form of guarantees must not result in an adjusted risk-weight that is less than that of a comparable, direct exposure to the guarantor or credit protection provider.

3.34.19 Guarantees must be:

- a) in writing and non-cancellable on the part of the guarantor or credit protection provider;
- b) in force until the debt is satisfied in full (to the extent of the amount and tenor of the guarantee); and

- c) legally enforceable against the guarantor or credit protection provider in a jurisdiction where that party has assets to attach and enforce a judgement.

- 3.34.20 A banking institution must have documented criteria for the process of allocating exposures to pools to reflect the impact of guarantees under the substitution approach. These criteria must meet the minimum requirements for assigning exposures to pools as set out in paragraphs 3.22.5 to 3.22.12. The banking institution's criteria for allocating exposures to pools must be plausible and intuitive and address the guarantor or credit protection provider'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 or credit protection provider's ability to perform under the guarantee is correlated with the obligor's ability to repay. A banking institution's adjustment criteria must also consider the extent to which residual risks remain. In allocating exposures to pools a banking institution must take all relevant material information into account.
- 3.34.21 There are no in-principle restrictions to the types of guarantors or credit protection providers that a banking institution may recognise under the substitution approach. The banking institution must, however, have clearly documented criteria for the types of guarantors and credit protection providers it will recognise for regulatory capital purposes.
- 3.34.22 Where guarantees exist, either in support of an individual obligation or a pool of exposures, a banking institution may reflect the risk-mitigating effect of such guarantees through either PD or LGD estimates. In adopting one or the other technique, a banking institution must adopt a consistent approach over time.
- 3.34.23 A banking institution must retain all relevant information on the assignment of an exposure to a pool and the estimation of PD and LGD independently of the assessed effect of the guarantor.

Double default approach

- 3.34.24 For small-business exposures included in the retail IRB asset class (see paragraph 3.19.9), a banking institution may, subject to meeting the operational requirements, use the double default approach in determining the appropriate capital requirement for a covered exposure.
- 3.34.25 The guarantees detailed in paragraph 3.32.20 are, subject to the operational requirements detailed in that section, eligible for recognition under the double default approach.

3.34.26 The calculation of risk-weighted assets under the double default approach is detailed in paragraphs 3.33.13 to 3.33.16.

Treatment of Maturity Mismatches

3.34.27 Maturity mismatches between the residual maturity of the term of lodgement of collateral and the maturity of the exposure covered by the collateral are defined and adjusted according to the requirements detailed in paragraph 3.16.93.

3.34.28 Under the substitution and double default approaches, maturity mismatches between the residual maturity of a guarantee and the maturity of the exposure covered by the guarantee are defined and adjusted according to the requirements detailed in paragraph 3.16.93.

Risk-weighted assets for the retail IRB asset class

3.34.29 There are separate IRB risk-weight functions for the three retail sub-asset classes, i.e. the residential mortgage sub-asset class; the qualifying revolving retail sub-asset class and the other retail sub-asset class (see paragraph 3.19.10). Throughout this section, PD and LGD are measured as decimals and EAD is measured in units of the functional currency. In all cases detailed in paragraphs 3.34.30 to 3.34.32, risk-weighted assets are calculated as $K \times 12.5 \times EAD$.

Residential mortgage sub-asset class

3.34.30 For non-defaulted exposures that are fully or partly secured²⁰ by residential properties, the risk-weight function is:²¹

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

²⁰ This means that the residential mortgage risk-weight function also applies to the unsecured portion of such residential mortgages.

²¹ $N(x)$ denotes the cumulative distribution function for a standard normal random variable (i.e. the probability that a normal random variable with mean zero and variance of one is less than or equal to x). $G(z)$ denotes the inverse cumulative distribution function for a standard normal random variable (i.e. the value of x such that $N(x) = z$).

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

Qualifying revolving retail sub-asset class

3.34.31 For non-defaulted QRR exposures as defined in paragraph 3.19.10a), the risk-weight function is:

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

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

Other retail sub-asset classes

3.34.32 Except where (and to the extent that) the double default approach applies, for all other non-defaulted retail exposures, the risk-weight function is:

$$\text{Correlation (R)} = 0.03 \times \left(\frac{1 - e^{-35PD}}{1 - e^{-35}} \right) + 0.16 \times \left[1 - \left(\frac{1 - e^{-35PD}}{1 - e^{-35}} \right) \right]$$

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

Capital requirement for defaulted retail exposures

3.34.33 The capital requirement (K) in respect of UL for defaulted retail exposures is equal to the greater of zero and the amount by which the product of a banking institution's own estimates of LGD³² (expressed in percentage terms) and EAD (expressed in dollar terms) exceeds its best estimate of EL given current economic circumstances and the facility's status. Risk-weighted assets for UL for defaulted assets are calculated as $K \times 12.5 \times EAD$.

Purchased Receivables

- 3.34.34 The treatment of purchased receivables straddles two IRB asset classes:
- a) purchased receivables that fall within the retail IRB asset class refer to pools of receivables that have been purchased by a banking institution where the underlying receivables meet the definition of retail exposures in paragraphs 3.19.8 to 3.19.10; and
 - b) purchased receivables that fall within the corporate IRB asset class refer to pools of receivables that have been purchased by a banking institution where the underlying receivables meet the definition of corporate exposures in paragraph 3.19.4.

Default Risk for Purchased Retail Receivables

- 3.34.35 The calculation of the capital requirement for default risk for purchased retail receivables is the same as that for the general retail IRB asset class.
- 3.34.36 When estimating PD and LGD for purchased retail receivables, a banking institution may utilise internal or external reference data. However, for each of the homogeneous risk buckets into which a pool is segmented (see paragraphs 3.34.23), these estimates must be determined on a standalone basis without regard to any assumption of recourse or guarantees from the seller or other parties.
- 3.34.37 For purchased receivables belonging to a particular retail sub-asset class (see paragraph 3.19.10), the risk-weight for default risk is based on the risk-weight function applicable to that sub-asset class. A banking institution must ensure that it meets the qualification criteria for the use of the relevant risk-weight function.
- 3.34.38 For hybrid pools containing receivables belonging to more than one retail sub-asset class, if the purchasing banking institution cannot separate the exposures by type of retail sub-asset class, the risk-weight function that produces the highest capital requirement at each PD level must be applied.

Default Risk for Purchased Corporate Receivables

- 3.34.39 Consistent with the general IRB treatment for corporate exposures, for purchased corporate receivables, a banking institution must assess the default risk of individual corporate obligors within each pool of purchased corporate receivables as detailed in paragraphs 3.22.5 to 3.22.10. A top-down approach may be used by a banking institution in certain limited circumstances, provided the particular purchased corporate receivables comply with the

criteria for eligible receivables detailed in paragraph 3.34.41 and the minimum operational requirements detailed in paragraph 3.35.11 are met.

3.34.40 The use of the top-down approach is subject to written approval from the Reserve Bank.

3.34.41 To be eligible for the top-down approach, purchased corporate receivables must satisfy the following conditions:

- a) the corporate receivables are purchased from unrelated, third-party sellers (i.e. the banking institution has not been directly or indirectly involved in originating the receivables);
- b) the receivables have been generated on an arms-length basis between the seller and the obligors. Inter-company accounts receivable and receivables subject to contra-accounts between firms that buy and sell amongst each other are ineligible;²²
- c) the purchasing banking institution has a claim on all proceeds from the pool of corporate receivables or a *pro rata* interest in the proceeds²³ commensurate with its exposure to the pool; and
- d) the maximum size of an individual exposure in the pool of purchased corporate receivables is less than \$100,000.

3.34.42 The existence of full or partial recourse to the seller does not automatically disqualify a banking institution from adopting a top-down approach provided the cash flows from the purchased corporate receivables are the primary source of ultimate repayment.

Top-Down Approach for Default Risk for Purchased Corporate Receivables

3.34.43 There are generally two top-down approaches for determining the capital requirement for default risk for purchased corporate receivables: a foundation approach and an advanced approach.

²² Contra-accounts involve a customer buying from and selling to the same firm. The risk is that debts may be settled through payments in kind rather than cash. Invoices between the companies may be offset against each other instead of being paid. This practice may defeat a security interest when challenged in court.

²³ Claims on tranches of the proceeds (e.g. first or second loss positions)

- 3.34.44 The advanced approach is not available for a banking institution that uses the FIRB approach for its general corporate IRB asset class.
- 3.34.45 Under both the foundation and advanced approaches, the risk-weight for default risk is determined using the risk-weight function for corporate exposures as detailed in paragraphs 3.33.3 to 3.33.10.²⁴ Under both approaches, the banking institution must segment pools of purchased corporate receivables into homogenous buckets (see paragraphs 3.35.2 to 3.35.3).

Foundation approach

- 3.34.46 Where a banking institution is able to reliably estimate PD for the segmented pools of purchased corporate receivables, it may, subject to the Reserve Bank's written approval, use the FIRB approach for determining default risk.
- 3.34.47 Where a banking institution is unable to reliably estimate PD for the segmented pools of purchased corporate receivables, it must estimate the expected long-run average loss rate for each of those homogeneous segmented pools.²⁵ In this case, the risk-weight for default risk is determined as follows:
- a) where the banking institution can demonstrate that the segmented pools are exclusively senior claims on corporate borrowers, an LGD of 45 per cent may be used. The PD estimate is determined by dividing the expected long-run average loss rate by 45 per cent;
 - b) where the banking institution is not able to demonstrate that the segmented pools are exclusively senior claims to corporate obligors, the PD estimate is the banking

²⁴ The firm-size adjustment, as defined in paragraphs 3.33.9 to 3.33.10, is the weighted average of individual exposures in the pool of purchased corporate receivables. If a banking institution does not have the information to calculate the average size of the pool, the firm-size adjustment does not apply.

²⁵ The expected long-run average loss rate must be a banking institution's estimate of the segmented pools' long-run average annual loss rate for default risk where the loss rate is expressed as a percentage of the exposure amount (i.e. the total EAD owed to the banking institution by all obligors in the segmented pool of receivables). The expected long-run average loss rate must be calculated for the receivables on a stand-alone basis (i.e. without regard to any assumption of recourse or guarantee from the seller or other parties). The treatment of recourse or guarantees covering default risk is detailed in paragraphs 3.35.6 to 3.35.10.

institution's estimate of the expected long-run average loss rate. In this case, LGD will be 100 per cent;

- c) EAD is the amount outstanding for each segmented pool less the capital charge for dilution risk for each segmented pool (see paragraphs 3.34.51 to 3.34.55) prior to CRM or, for a revolving purchase facility, the sum of the current amount of receivables purchased plus 100 per cent of any undrawn purchase commitments less the capital charge for dilution risk prior to CRM; and
- d) M for drawn amounts will equal the segmented pools' exposure-weighted average maturity. This same value of M will also be used for any undrawn amounts to which the banking institution is committed under a purchased receivables facility, provided that the facility contains covenants, early amortisation triggers or other features that protect the purchasing banking institution against a significant deterioration in the quality of the future receivables it is required to purchase over the facility's term. In the absence of such protection, the M for undrawn amounts will be calculated as the sum of:
 - (i) the longest-dated potential receivable under the purchase agreement; and
 - (ii) the remaining maturity of the purchase facility.

Advanced Approach

- 3.34.48 Under the advanced approach, a banking institution must estimate PD and LGD for each of the homogeneous segmented pools of purchased corporate receivables.
- 3.34.49 Where a banking institution can only reliably estimate one of either the default-weighted average PD or LGD for each segmented pool, the banking institution may estimate the other required credit risk component based on its estimate of the expected long-run average loss rate³⁷ of the segmented pool. In either case, the LGD may not be less than the long-run default-weighted average LGD and must be consistent with the concepts detailed in the section on standards for all IRB asset classes.
- 3.34.50 EAD and M estimates under the advanced approach for purchased corporate receivables are the same as those in the foundation approach detailed in paragraphs 3.34.47c) and 3.34.47d).

Dilution risk

- 3.34.51 Unless a purchasing banking institution can demonstrate to the Reserve Bank that dilution risk is immaterial, a capital requirement for dilution risk is required for purchased corporate and retail receivables.
- 3.34.52 For the purposes of calculating the capital requirement for dilution risk for either segmented pools or individual receivables making up a pool, a purchasing banking institution must estimate the expected long-run average annual loss rate for dilution risk.²⁶
- 3.34.53 A banking institution may utilise internal or external reference data to estimate an expected long-run average annual loss rate for dilution risk. However, these estimates must be calculated on a stand-alone basis without regard to any assumption of recourse or guarantees from the seller or other parties.
- 3.34.54 For the purpose of calculating the capital requirement for dilution risk, the corporate IRB risk-weight function detailed in paragraphs 3.33.3 to 3.33.10 must be used, with PD set equal to the estimate of the expected long-run average annual loss rate and LGD set to 100 per cent.
- 3.34.55 An appropriate maturity must be used when determining the capital requirement for dilution risk. If the banking institution can demonstrate to the Reserve Bank that dilution risk is appropriately monitored and managed so as to be resolved within one year of acquisition of the purchased receivables, the Reserve Bank may grant an approval in writing allowing the banking institution to base its calculations on a one-year maturity assumption.

3.35 Requirements Specific To Estimating PD and LGD (Or Expected Losses) For Purchased Corporate and Retail Receivables

- 3.35.1 The following minimum requirements for risk quantification must be satisfied in order to apply the top-down approach for:
- a) default risk (in relation to purchased corporate receivables); or
 - b) dilution risk (in relation to purchased corporate or retail receivables).
- 3.35.2 The banking institution is required to group purchased receivables into sufficiently homogeneous segmented pools so that accurate and consistent estimates of PD and LGD (or

²⁶ The expected long-run average loss rate is expressed as a percentage of the exposure amount, i.e. the total EAD owed to the banking institution by all obligors in the relevant pool of receivables.

expected long-run average loss rates) for default risk and expected long-run average loss rates for dilution risk can be determined.

- 3.35.3 The risk-bucketing process should reflect the seller's underwriting practices and heterogeneity of its customers. Methods and data for estimating PD, LGD and expected long-run average loss rates must comply with the risk quantification standards for retail exposures detailed in paragraphs 3.27.1 to 3.27.12. In particular, quantification should reflect all information available to the banking institution regarding the quality of the underlying receivables, including data relating to similar pools provided by the seller, the banking institution or external sources. The banking institution must determine whether the data provided by the seller are consistent with expectations agreed by both parties concerning, for example, the type, volume and ongoing quality of the purchased receivables. Where this is not the case, the banking institution must obtain and rely upon more relevant data.

Purchase Price Discounts and First Loss Protection

- 3.35.4 Where a portion of any purchase price discount is refundable to the seller, the refundable amount must be treated as first loss protection. Non-refundable purchase price discounts for purchased receivables do not affect the regulatory capital calculation.
- 3.35.5 When collateral or partial guarantees obtained on purchased receivables provide first loss protection covering default losses, dilution losses, or both, they must be recognised as first loss protection.

Recognition of Guarantees

- 3.35.6 Guarantees for purchased receivables are recognised in the same manner as other guarantees under the IRB approach. The IRB rules for guarantees may be applied to guarantees provided by the seller or a third party regardless of whether the guarantee covers default risk, dilution risk or both.
- 3.35.7 If the guarantee covers a pool's default risk and dilution risk, the banking institution may substitute the risk-weight for an exposure to the guarantor in place of the relevant pool's total risk-weight for default and dilution risks.
- 3.35.8 If the guarantee covers only one of either default risk or dilution risk, the banking institution may substitute the risk-weight for an exposure to the guarantor in place of the relevant pool's risk-weight for the corresponding risk component. The capital requirement for the non-guaranteed component must then be added.

- 3.35.9 If a guarantee covers only a portion of the default or dilution risk of a relevant pool, the uncovered portion must be treated using the rules for proportional or tranching cover detailed in paragraph 3.31.2.
- 3.35.10 If the guarantee provides protection against dilution risk and the conditions and operational criteria detailed in paragraphs 3.32.20 to 3.32.21 are satisfied, the double default framework may be used by the banking institution for the calculation of the risk-weighted asset amount for dilution risk. In this case, the capital charge is the same as that detailed in paragraphs 3.33.13 to 3.33.16 with PD_0 being equal to the banking institution's estimated EL, LGD_{DD} being equal to 100 per cent and maturity determined in accordance with paragraph 3.34.55.

Minimum Operational Requirements...

- 3.35.11 To qualify for the top-down approach for default risk for purchased corporate and retail receivables, the pools of receivables and overall lending relationship must be closely monitored and controlled by the banking institution. Specifically, the banking institution must demonstrate the following:
- a) legal certainty - the structure of the facility under which the receivables are purchased must ensure that under all foreseeable circumstances, the banking institution has effective ownership and control of the cash remittances from the receivables, including incidences of seller or servicer distress and bankruptcy. When obligors make payments directly to a seller or servicer, the banking institution must verify regularly that all payments are forwarded to it within the contractually agreed terms. Ownership over the receivables and cash receipts should be protected against bankruptcy or legal challenges that could materially delay the banking institution's ability to liquidate or assign the receivables or retain control over cash remittances;
 - b) monitoring systems - the banking institution must be able to monitor both the quality of the receivables and the financial condition of the seller and servicer. In particular:
 - i. the banking institution must assess the correlation between the quality of the receivables and the financial condition of both the seller and servicer. The banking institution must 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;
 - ii. the banking institution must have clear and effective policies and procedures for determining seller and servicer eligibility. The banking institution or its agent

must conduct periodic reviews of sellers and servicers in order to verify the accuracy of reports from the seller or servicer, detect fraud or operational weaknesses and verify the quality of the seller's credit policies and the servicer's collection policies and procedures. The findings of these reviews must be documented;

- iii. the banking institution must have the ability to assess the characteristics of the pools of receivables, including over-advances, history of the seller's arrears, bad debts and bad debt allowances, payment terms and potential contra-accounts;
- iv. the banking institution must have effective policies and procedures for monitoring, on an aggregate basis, single-obligor concentrations both within and Across pools of receivables; and
- v. the banking institution must receive timely and sufficiently detailed reports of the aging of receivables and dilution to ensure compliance with the banking institution's eligibility criteria and underwriting policies governing purchased receivables and provide an effective means with which to monitor and confirm the seller's terms of sale (e.g. invoice date aging) and dilution;
- vi. effective work out systems - the banking institution must have policies and procedures for the early detection and control of a deterioration in the seller's financial condition and the quality of the receivables;
- vii. effective systems for controlling collateral, credit availability and cash - the banking institution must have policies and procedures governing the control of receivables, credit and cash;
- viii. compliance with the banking institution's internal policies and procedures - given the reliance on monitoring and control systems to limit credit risk, the banking institution must have an internal process for assessing compliance with all critical policies and procedures; and
- ix. the banking institution's internal process for assessing compliance with critical policies and procedures must include evaluations of back office operations with particular focus on its independence, qualifications, experience, staffing levels and supporting systems.

Other Assets, Claims and Exposures

Equity exposures

- 3.35.12 The measure of an equity exposure on which regulatory capital is based is the current book value, including revaluations, net of specific provisions.
- 3.35.13 A 300 per cent risk-weight applies to exposures that fall within the equity IRB asset class that are not deducted from capital and that are listed on a recognised exchange.
- 3.35.14 A 400 per cent risk-weight applies to exposures that fall within the equity IRB asset class that are not deducted from capital and that are not listed on a recognised exchange.
- 3.35.15 Short positions held in the banking book are permitted to offset long positions in the same individual equities 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.

Leases

- 3.35.16 Leases, other than those that expose a banking institution to residual value risk (see paragraph 3.35.17), may be treated in the same manner as exposures secured by the relevant collateral.²⁷ In addition, the following standards must be met by the banking institution :
- a) robust risk management practices with respect to the location of the leased asset, its use, age and planned obsolescence;
 - b) a robust legal framework establishing the banking institution's legal ownership of the leased asset and its ability to exercise its rights as owner in a timely manner; and
 - c) the difference between the rate of depreciation of the leased asset and the rate of amortisation of the lease payments must not be so large as to overstate the CRM effect of the leased asset.
- 3.35.17 For leases that expose the banking institution to residual value risk,²⁸ the discounted lease payment stream must be risk-weighted according to the PD and LGD the banking institution assigns to the lessee and the residual value must be risk-weighted at 100 per cent.

²⁷ A banking institution may use its own estimates of LGD and EAD if it uses the AIRB approach for exposures in the corporate IRB asset class; otherwise it must use supervisory estimates.

²⁸ Residual value risk is the risk that a banking institution is exposed to potential loss due to the fair value

Cash items

- 3.35.18 The risk-weight for notes, coins, and gold bullion held in the banking institution's own vaults or on an allocated basis by another party to the extent that it is backed by gold bullion liabilities is zero per cent.
- 3.35.19 The risk-weight for cash items in the process of collection (e.g. cheques, drafts and other items drawn on other local or international banking that are payable immediately upon presentation and that are in the process of collection) is 20 per cent.

Unsettled and Failed Transactions

- 3.35.20 The IRB capital requirement for unsettled and failed transactions is the same as that detailed in credit risk MSA section. Where a non-delivery-versus-payment transaction is required to be treated as an exposure under the MSA section and the banking institution has no other banking book exposure to the counterparty, it may assign a PD based on the counterparty's external rating (where available). Where the banking institution uses the AIRB approach for its general corporate, sovereign or bank exposures, it may use a 45 per cent LGD estimate for a free delivery transaction that is treated as an exposure provided that it is applied to all such exposures. Alternatively, the banking institution may risk-weight such exposures according to the risk-weights detailed in MSA section or apply a 100 per cent risk-weight provided that all such exposures are risk-weighted in the same manner.
- 3.35.21 In the case of a system-wide failure of a settlement or clearing system, the failure of a counterparty to settle a trade need not be deemed a default for the purpose of this Guideline.

Related-party exposures

- 3.35.22 Exposures (other than exposures included in the equity IRB asset class) to entities that are wholly owned or effectively controlled by the banking institution for capital adequacy purposes must be risk-weighted according to the relevant risk-weights detailed in the MSA section. The measure of such exposures on which regulatory capital is based is the current book value, including accrued interest and net of specific provisions.
- 3.35.23 The risk-weight for margin lending against listed instruments on recognised exchanges is 20 per cent. Where the underlying instruments are unlisted, the banking institution must treat the exposure as a secured loan and determine the capital requirement according to the provisions

of a leased asset declining below its residual estimate at the inception of the lease.

of MSA. The measure of such exposures on which regulatory capital is based, is the current book value net of specific provisions.

Fixed Assets and All Other Claims

3.35.24 The risk-weight for investments in premises, plant and equipment and all other fixed assets, including those under an operating lease and all other claims not otherwise defined in this Guideline, is 100 per cent. The measure of such exposures on which regulatory capital is based is the current book value, including revaluations, net of specific provisions or associated depreciation.

B) ALLOCATING CAPITAL FOR OPERATIONAL RISK

3.36 Introduction

3.36.1 The Reserve Bank, has prescribed various soundness standards for operational risk management for banking institutions. The operational risk management framework should, at a minimum include identification, measurement, monitoring, reporting, control and mitigation frameworks for operational risk.

3.36.2 The identification and measurement of operational risk is important is calculating the operational risk capital charge.

3.36.3 This section provides guidance to banking institutions on the methods for allocating capital for operational risk and the accompanying governance requirements, in line with Basel II.

3.37 Standardized Approach for Operational Risk

Definitions

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

3.37.2 **adjusted gross income** - is equal to total operating income from continuing operations excluding income and excluding items for which operational risk regulatory capital is separately calculated;

3.37.3 **gross income** - total operating income from continuing operations;

3.37.4 **operational risk regulatory capital (ORRC)** - the regulatory capital that a banking institution is required to hold against its exposure to operational risk.

Key principles

3.37.5 For regulatory capital purposes, a banking institution must divide its business activities into three areas of business:

- a. retail banking;
- b. commercial banking; and
- c. all other activities.

3.37.6 The banking institution's ORRC for the retail and commercial banking areas of business must be determined using a proportion of total gross outstanding loans and advances as an indicator of each area's operational risk exposure. The ORRC for the all other activity area is determined by using gross income, adjusted to exclude income primarily relating to retail banking and commercial banking (adjusted gross income).

Retail and commercial banking areas

3.37.7 A banking institution's total gross outstanding loans and advances is defined as the total on-balance sheet exposure to the following items:

Retail banking

- a) **cash** holdings of notes and coins; and
- b) loans to households.

Commercial banking

- a) all deposits and amounts due from financial institutions;
- b) securities held in the banking book; and
- c) commercial lending.

3.37.8 A banking institution that has funded positions with respect to corporate finance activities, must exclude those positions for the purpose of measuring total gross banking institution outstanding loans and advances for the commercial banking area of business. In addition, the securitization balances that are excluded from risk-weighted assets must also be excluded from total gross outstanding loans and advances for the retail banking and commercial banking areas of business.

3.37.9 A banking institution must, in calculating its total gross outstanding loans and advances within the commercial banking area of business, include the gross book value of securities²⁹ held in the banking book, excluding those arising from the banking institution's involvement in corporate finance related activities and those that are deducted from capital.

All other activity area

3.37.10 A banking institution must, as an indicator of the operational risk exposure arising from **all other activity**, determine the capital requirement for that activity using **adjusted gross income**. Adjusted gross income may exclude irregular items but the amount must include income (including net interest income and servicing activities) from the banking institution's involvement in securitisation, trading activities³⁰ and corporate finance activities. In the

²⁹ A security for the purposes of this guideline includes all debt securities held in the banking book.

³⁰ For trading activities, net income includes profits and losses on instruments held for trading purposes, net of funding costs, plus fees from wholesale broking.

absence of any adjustments, adjusted gross income will equate to total operating income from continuing operations.

- 3.37.11 The banking institution must be able to demonstrate to the Reserve Bank that the ORRC for the retail or commercial banking areas of business adequately captures the operational risks associated with the activities to which these items relate.

Calculation of operational risk regulatory capital

- 3.37.12 A banking institution’s total ORRC must equal the sum of the average results for the areas of retail banking, commercial banking and all other activity. The component formulae are detailed below.

- 3.37.13 The total ORRC is calculated as follows:

$$K_{SA} = \frac{\sum_{t=1}^6 (0.12 \times m \times LAR_t)}{6} + \frac{\sum_{t=1}^6 (0.15 \times m \times LAC_t)}{6} + \frac{\sum_{t=1}^6 \max [(0.18 \times AGI_t), 0]}{3}$$

where:

KSA = the total operational risk regulatory capital under the standardised approach to operational risk

m = a fixed scaling factor of 0.035

LAR_t = total gross outstanding loans and advances for the retail banking area of business measured at the end of each financial year and half-year of the banking institution

LAC_t = total gross outstanding loans and advances for the commercial banking area of business measured at the end of each financial year and half-year of the banking institution

AGIt = adjusted gross income earned over a six month period at the end of each financial year and half-year of the banking institution

t = half-yearly observation period (at the end of each financial year and half-year of the banking institution)

3.37.14 A banking institution must multiply KSA by 10 in order to convert the operational risk capital requirement to a risk-weighted asset equivalent.

Retail banking area...

3.37.15 A banking institution must calculate its ORRC for the retail banking area of business by:

- a) taking the last six consecutive half-yearly balances of total gross outstanding loans and advances for the retail banking area of business;
- b) multiplying 3.5 per cent of total gross outstanding loans and advances at each observation point, by a factor of 12 per cent, to produce a result in respect of each observation; and
- c) determining an average half-yearly result.

Commercial banking area...

3.37.16 For the commercial banking area of business, a banking institution must calculate its ORRC by:

- a) taking the last six consecutive half-yearly balances of total gross outstanding loans and advances for the commercial banking area of business;
- b) multiplying 3.5 per cent of total gross outstanding loans and advances at each observation point, by a factor of 15 per cent, to produce a result in respect of each observation; and
- c) determining an average half-yearly result.

All other activity area...

3.37.17 The ORRC for a banking institution's all other activity area of business must be calculated by:

- a) taking the last six consecutive half-yearly amounts of adjusted gross income earned over a six month period;
- b) multiplying adjusted gross income at each observation point by a factor of 18 per cent

- to produce a result in respect of each observation; and
- c) determining an average full-year result.

3.37.18 A banking institution must, when calculating the three-year average for the all other activity area of business, set an observation to zero and include that zero observation in the numerator of the formula if, for any given observation, the banking institution's adjusted gross income is negative.

Financial statements...

3.37.19 A banking institution must reconcile, on a timely basis, the calculations for capital for operational risk with its audited year-end financial statements and, where available, its half-year financial statements. The banking institution may, with the Reserve Bank's prior written approval, use business estimates or forecasts when actual balances are not available (e.g. in the case of a banking institution in its early years of operation). In the event of a merger, aggregated balances must be used unless otherwise agreed to by the Reserve Bank.

Minimum Requirements

3.37.20 A banking institution must ensure 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 that is conceptually sound and is implemented with integrity; and
- c) It has sufficient resources in the use of the approach as well as the control and audit areas.

3.37.21 A banking institution must develop specific policies and have documented criteria for mapping gross income into the retail banking, commercial banking and all other activity areas. The criteria must be reviewed and adjusted for new or changing business activities as appropriate.

3.37.22 The banking institution must have an operational risk management system with clear responsibilities assigned to an operational risk management function. The function must be 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.

- 3.37.23 As part of the banking institution's internal operational risk assessment system, the bank must 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 of the bank. Its output must be an integral part of the process of monitoring and controlling the banks operational risk profile.
- 3.37.24 There must be regular reporting of operational risk exposures, including material operational losses, to business unit management, senior management, and to the board of directors. The banking institution must have procedures for taking appropriate action according to the information within the management reports.
- 3.37.25 The banking institution's operational risk management system must be 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 non-compliance issues.
- 3.37.26 The banking institution's operational risk management processes and assessment system must be 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.
- 3.37.27 The banking institution's operational risk assessment system (including the internal validation processes) must be subject to regular review by external auditors.

3.38 Operational Risk: Advanced Measurement Approach

Scope

- 3.38.1 These requirements apply to all operations and activities of a banking institution that has the Reserve Bank's approval to use the Advanced Measurement Approach for operational risk.

Definitions

- 3.38.2 The following definitions are used in this section:
- a) **AMA** - an advanced model-based approach used to measure a banking institution's regulatory capital for operational risk, which requires approval by the Reserve Bank;

- b) **allocation mechanism** – a Reserve Bank approved process by which a banking group allocates or distributes regulatory capital for operational risk to legal entities within the group, with the banking institution determining its operational risk regulatory capital (ORRC) by reference to the ORRC allocated to it as a member of the group;
- c) **operational risk** - the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This includes legal risk, but excludes strategic and reputational risks;
- d) **ORRC** - the regulatory capital that a banking institution is required to hold against its exposure to operational risk.
- e) **operational risk management framework** - the organizational structures, processes and systems used in identifying, assessing, measuring, monitoring, controlling and mitigating operational risk;
- f) **operational risk measurement system** - the systems and data of the operational risk management framework used to measure operational risk;
- g) **operational risk measurement model** - the model central to the operational risk measurement system that is used by the banking institution to quantify its ORRC;
- h) **related body corporate** - a body corporate that is related to another body corporate; and
- i) **third party** - an entity that is not the banking institution or a related body corporate of the banking institution.

Key principles

3.38.3 A banking institution that has received approval from the Reserve Bank to use an AMA must:

- j) have in place a robust operational risk management framework and a conceptually sound operational risk measurement system; and
- k) hold regulatory capital commensurate with its exposure to operational risk.

Approval process

- 3.38.4 A banking institution requires the Reserve Bank's prior written approval to use AMA for capital adequacy purposes.
- 3.38.5 Unless exempted by the Reserve Bank, a bank must seek approval to use AMA along with the internal ratings-based approach to credit risk and the internal risk measurement model for the purpose of determining the banking institution's regulatory capital for interest rate risk in the banking book.
- 3.38.6 A banking institution that has received AMA approval may rely on its own internal estimate (based on the approved operational risk measurement model) of operational risk for determining its ORRC. That estimate must be fundamentally sound and consistent with the scope of operational risk.
- 3.38.7 The Reserve Bank's prior written approval is required for any material changes to the operational risk measurement model and other material components of the operational risk management framework.
- 3.38.8 Once a banking institution has obtained AMA approval, it must continue to employ the AMA on an ongoing basis unless, or except to the extent that, the AMA approval is revoked or suspended for some or all of the bank's operations, in which case the banking institution should revert to the standardised approach to operational risk.
- 3.38.9 The Reserve Bank may require a banking institution with AMA approval to reduce its level of operational risk or increase its capital if it is considered that the institution's ORRC is not commensurate with the operational risk profile.

Allocation of operational risk regulatory capital

- 3.38.10 Approval from the Reserve Bank for the use of AMA as a capital allocation mechanism is conditional upon the bank demonstrating that:
- a) the allocation mechanism is appropriately risk-sensitive and continues to reflect the operational risk profile of the legal entity and its contribution to the banking group;
 - b) the allocation mechanism is implemented consistently, is empirically supported and continues to be relevant and stable over time;
 - c) the amount of ORRC that is allocated to the entity continues to be sufficient given the operational risk profile of that entity; and

- d) the Board, or Board committee, and senior management have conducted their own assessment of the entity's risks and controls, and are satisfied that the entity continues to be adequately capitalised in respect of operational risk.

Adoption of the advanced measurement approach

- 3.38.11 The following are some of the AMA techniques available to a banking institution:
- a. Internal Measurement Approach (IMA);
 - b. Loss Distribution Approach (LDA) ;
 - c. Structured scenario analysis;
 - d. Scorecard Approach;
 - e. Hybrid.
- 3.38.12 The Reserve Bank will generally require a banking institution that has AMA approval to apply the AMA across all business activities.
- 3.38.13 However, the Reserve Bank may approve an institution to use a combination of the AMA and the standardised approach to operational risk for measuring its ORRC. This approach is referred to as **partial use**.
- 3.38.14 A banking institution must provide the Reserve Bank with appropriate written information, both at the time of initial application for AMA approval and subsequent to obtaining AMA approval, on the business activities for which the institution proposes to use the standardised approach to operational risk.
- 3.38.15 Approval for partial use of an AMA will, at a minimum, require that:
- a) all material operational risks across the bank are captured (by the combined AMA and standardised approach) within the total amount of regulatory capital for operational risk; and
 - b) a substantial majority of the bank's operational risks are captured by the AMA.
- 3.38.16 The Reserve Bank may approve partial use of a bank's AMA on a short-term basis. In this case, the banking institution will be required to adopt a phased roll-out of the AMA across all material business activities. A phased roll-out may include (but need not be limited to) adoption of the AMA, in accordance with a specified timetable, across business activities within a particular legal entity or legal entities within the consolidated banking group.
- 3.38.17 A banking institution that has received approval to adopt a phased roll-out of the AMA must have a written implementation plan in place that specifies the extent and timing of roll-out of the AMA across all material business activities.

3.38.18 Permanent partial use of an AMA will be approved only in exceptional circumstances where those business activities to which the AMA does not apply are immaterial in terms of size and perceived risk profile. The calculated ORRC for such business activities, if considered necessary by Reserve Bank, may be subject to additional regulatory capital.

Operational risk management framework

3.38.19 A banking institution with AMA approval must have in place an operational risk management framework that is sufficiently robust to facilitate quantitative estimates of ORRC that are sound, relevant and verifiable.

3.38.20 A banking institution seeking AMA approval must demonstrate the processes it has undertaken to establish an operational risk management framework. The bank will also be required to demonstrate the processes that are undertaken to ensure the operational risk management framework has continued relevance to the institution's operations.

Responsibilities of the Board of directors and senior management...

3.38.21 A banking institution's Board is responsible for the overall operational risk profile and operational risk management framework. Accordingly, the operational risk management framework must be approved by the Board, or a Board committee.

3.38.22 In the latter case, the committee must have clearly defined responsibilities, operational risk loss thresholds for reporting to the Board and performance obligations. The approved framework must clearly articulate respective responsibilities and reporting relationships.

3.38.23 To ensure the continued effectiveness of the operational risk management framework, the Board, or Board committee, must ensure that the framework is subject to periodic validation and review by a suitable independent party.

3.38.24 The Board or Board committee, must review operational risk management reports on a regular basis and satisfy itself that this risk is appropriately managed.

3.38.25 Senior management must have a thorough understanding of the operational risk management framework, be actively involved in its implementation and ensure its effective operation over time. To facilitate this, the banking institution must have in place an executive committee, with appropriate representation from across the bank, which focuses on the management and measurement of operational risk. The executive committee must hold regular meetings to discuss matters including the performance of the framework, areas requiring improvement and the status of efforts to address previously identified deficiencies.

- 3.38.26 The banking institution must have an independent operational risk management function. This function must have a suitable independent reporting line, providing access to the executive committee.
- 3.38.27 Senior management must, in conjunction with the operational risk management function, develop appropriate policies, procedures and processes relating to the operational risk management framework.
- 3.38.28 Senior management must provide notice to the Board, or Board committee, of material changes or exceptions from established policies that could have an impact on the operation of the operational risk management framework, including the operational risk capital requirement.
- 3.38.29 A banking institution must have sufficient numbers of personnel skilled in the management and measurement of operational risk to ensure that its operational risk management framework continues to operate effectively.

Operational risk management function

- 3.38.30 A banking institution must have an independent specialist operational risk management function. This function must:
- a) have reporting lines and responsibilities that are functionally independent of the operational risk generating business units;
 - b) have all roles and responsibilities of people and functions involved in operational risk management clearly defined and documented, particularly where staff with operational risk management responsibility and dual reporting lines to the function and business unit management are embedded in the business units;
 - c) have responsibility for the design, maintenance and ongoing development of the operational risk management framework, inclusive of the operational risk measurement system and reporting process, and for ensuring its consistent implementation across all business units (in conjunction with senior management and management in general; and
 - d) continuously monitor the banking institution's compliance with the operational risk management framework.

Documentation of the operational risk management framework

- 3.38.31 A banking institution's operational risk management framework must be clearly documented.

- 3.38.32 Documentation relating to an operational risk measurement system must be comprehensive and provide a level of detail sufficient to ensure that the bank's approach to determining its ORRC is transparent and capable of independent review and validation.
- 3.38.33 A banking institution's technical documentation relating to its operational risk measurement system must include the following information:
- a) the rationale for all assumptions and specifications underpinning the operational risk measurement system;
 - b) the analytics and relevant theory behind all calculations;
 - c) details of the parameters and assumptions of the operational risk measurement model including the bank's justification for their use and the process undertaken for checking and validating those assumptions;
 - d) an explanation of how the banking institution ensures that the required soundness standard is achieved;
 - e) details of any explicit and implicit dependence structures utilised in the operational risk measurement model, including evidence supporting their use;
 - f) details of the proposed methodology for measuring and accounting for expected loss; and
 - g) details of the methodology relating to the use of insurance for risk mitigation, including how the level of insurance mitigation is derived and the types of insurance contracts utilised.

Internal reporting of the operational risk profile

- 3.38.34 A banking institution must implement a process to regularly monitor its operational risk profile. To support the proactive management of operational risk, there must be regular reporting of relevant information to the Board, or Board committee, and senior management.
- 3.38.35 In developing an appropriate internal reporting framework, the bank must consider the nature of its operational risk and the strategy adopted for managing and measuring it. Management reports must be produced and reviewed regularly and include information on the output of the operational risk measurement model and operational risk loss reporting thresholds. The

reviews must be conducted by a level of management with sufficient seniority and authority to enforce, where necessary, mitigation of the operational risk.

3.38.36 A banking institution must have in place a process for ensuring that the Board, or Board committee, and senior management are able to respond appropriately to the information contained in operational risk management reports. This process should include escalation procedures for key operational risk issues to facilitate appropriate action between formal reporting cycles.

3.38.37 In addition to monitoring internal and external operational risk loss events, the bank must identify, and include in its reporting framework, appropriate indicators that provide early warnings of potential operational risk-related losses.

Integration of measurement system into day-to-day management

3.38.38 A banking institution's operational risk measurement system must be closely integrated into the bank's risk management processes. This requires that the inputs and outputs of the bank's operational risk measurement system, as relevant, play an integral role in the bank's decision-making, corporate governance, risk management and internal capital allocation processes.

3.38.39 A banking institution's operational risk measurement system must be capable of allocating economic capital for operational risk to internal business lines. The process for allocating capital must be consistent across the bank and sufficiently granular such that it creates incentives to improve business line operational risk management. Consistent with the bank's economic capital allocation methodology, the drivers of operational risk capital, as one of the key mechanisms for influencing operational risk management behaviour, must be sufficiently understood by business lines. Moreover, each business line must be able to clearly articulate the drivers of its operational risk profile and demonstrate how it utilises the outputs of the operational risk measurement system to supplement its day-to-day management processes.

Operational risk measurement system

3.38.40 A banking institution's operational risk measurement system must be:

- a) conceptually sound, comprehensive, consistently implemented, transparent and capable of independent review and validation; and
- b) sufficiently comprehensive to capture all material sources of operational risk across the bank, including those events that can lead to rare and severe operational risk losses.

- 3.38.41 As part of the AMA approval process, a banking institution will be required to demonstrate the appropriateness of the ORRC determined by the operational risk measurement system and commensurate with its operational risk profile. The institution must justify to the Reserve Bank any material changes in the calculated ORRC as part of its ongoing use of an AMA.
- 3.38.42 A banking institution must be able to demonstrate that its ORRC, as determined by the operational risk measurement model, meets a soundness standard comparable to a one-year holding period and a 99.9 per cent confidence level (the soundness standard). This soundness standard provides significant flexibility for a bank to develop an operational risk measurement system that best suits the nature and complexity of the bank's activities. Given the subjectivity and uncertainty of operational risk measurement modelling, an institution must be conservative in the modelling choices and assumptions used in its operational risk measurement model, including the assessment and incorporation of severe loss events. In adopting a conservative modeling approach, the bank must consider the results of sensitivity analysis.
- 3.38.43 A banking institution's ORRC must cover expected losses (EL) and unexpected losses (UL) unless the bank can demonstrate that it has adequately measured and accounted for EL in its business practices by way of EL offsets. For operational risk EL to be measured and accounted for to the satisfaction of the Reserve Bank, the bank must be able to demonstrate that the EL offsets are:
- a) highly predictable, routine and reasonably stable over time;
 - b) estimated using a process that is conceptually sound, implemented with integrity and consistently applied over time;
 - c) available to cover EL with a high degree of certainty over a one-year time horizon;
 - d) used to support the management of the business including being systematically budgeted and considered in pricing of related products and services; and
 - e) subject to regular review by the banking institution for reasonableness given comparisons with subsequent outcomes.
- 3.38.44 Accounting provisions or reserves for operational risk loss events that have already occurred do not qualify as allowable EL offsets. The bank must clearly document how its operational risk EL is measured and accounted for, including how any offsets for EL meet the conditions above.
- 3.38.45 A banking institution's operational risk measurement system must reasonably estimate the ORRC based on the combined use of internal and relevant external operational risk loss data,

scenario analysis and factors reflecting the business environment and internal control systems. The bank must have in place a process for systematically tracking operational risk loss data.

- 3.38.46 Data sources and methodologies utilised for the purposes of determining banking institution's economic capital estimate for operational risk must be consistent with the operational risk measurement system used to determine the ORRC. Where there are differences, the banking institution will be required to explain to the Reserve Bank's satisfaction the reasonableness of those differences.
- 3.38.47 Subject to meeting the minimum criteria, and written approval from the Reserve Bank, a banking institution may recognise the risk-mitigating effect of insurance in determining its ORRC. The recognition of insurance will be limited to 20 per cent of the total ORRC calculated using the bank's operational risk measurement model.
- 3.38.48 The ORRC must be calculated on at least an annual basis or when there is a material change in the bank's operational risk profile or a material change is made to the operational risk management framework. In addition, the bank must review the ORRC on at least a half-yearly basis to ensure that it continues to reflect the operational risk profile.
- 3.38.49 A banking institution with AMA approval must meet the quantitative standards for measuring ORRC detailed in this guideline.

Operational risk measurement system track record

- 3.38.50 A banking institution's operational risk measurement system must have a reasonable track record in measuring operational risk. Accordingly, before the bank receives an AMA approval, the institution's operational risk measurement system will be subject to a period of initial monitoring by the Reserve Bank prior to its use for the calculation of the ORRC. The length of this monitoring period will depend upon the performance of the bank's operational risk management framework and its track record in managing and measuring operational risk.

Detailed criteria

- 3.38.51 A banking institution's operational risk measurement system must be consistent with its scope of operational risk and the loss event categories.
- 3.38.52 In order to meet the soundness standard, a bank's operational risk measurement system must incorporate key data inputs. These inputs are internal and relevant external operational risk loss data, scenario analysis and factors reflecting the bank's business environment and internal control systems. In determining its ORRC, the institution's operational risk measurement

system must take into account available information related to these data inputs in a timely and consistent manner. Requirements for the use of these inputs within an operational risk measurement system are detailed in this guideline.

- 3.38.53 A banking institution must have a reliable, transparent and verifiable approach for incorporating data inputs into its operational risk measurement system. The inputs must be combined in a manner that most effectively enables the bank to quantify its operational risk profile. The bank's approach for incorporating these inputs should be internally consistent and avoid the double-counting of qualitative assessments or risk mitigants already recognised in other elements of the operational risk management framework.
- 3.38.54 Irrespective of a banking institution's operational risk measurement approach, the bank will be expected to calculate its ORRC through the use of probability distributions of its operational losses. The banking institution must demonstrate that it has considered a reasonably comprehensive set of alternative probability distributions and operational risk classifications and that the selected probability distributions most appropriately represent the operational risks in each class.
- 3.38.55 A banking institution may use internal estimates of dependence among operational risk losses across operational risk classes if it can demonstrate that its systems for a variety of scenarios (particularly stress scenarios), implemented with integrity and appropriately take into account the level of uncertainty surrounding the estimates. The bank must validate its dependence assumptions using appropriate quantitative and qualitative techniques. The bank must sum the risk measures across its operational risk classes to calculate its total ORRC, unless it has received written approval from the Reserve Bank allowing it to incorporate its dependence assumptions in the calculation of distributions or dependence levels and structures is difficult to verify empirically, or is uncertain, the banking institution must conduct sensitivity analysis of its ORRC over the considered distributions and over a reasonably comprehensive range of dependence levels and structures. Where the variation in the ORRC over the considered loss distributions or dependence levels and structures is found to be material, the bank must demonstrate that its estimation procedures are appropriate.
- 3.38.56 A banking institution must collect and retain the output of its operational risk measurement system in electronic form for a minimum of five years.
- 3.38.57 A banking institution must map its ORRC to the Category 1 business lines detailed in the table below. This mapping process must be clearly documented.

Table 15: Mapping of Business Lines

Mapping of Business Lines		
Category 1	Category 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 book and Sales	Sales	Fixed income, equity, foreign exchanges, own position securities, lending and repos, brokerage, debt and 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, guarantees, bills of exchange
Payment and Settlement³¹	External Clients	Payments and collections, funds transfer, clearing and settlement
Agency Services	Custody	Depository receipts, securities lending (Customers)
	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

Data

3.38.58 A banking institution must have in place policies (as part of its operational risk management framework) relating to its AMA data requirements. These policies must be clearly documented and may vary by types of data. Specifically, the policies must address data quality and align with the corporate data management framework.

³¹ Payment and settlement losses related to a bank's own activities would be incorporated in the loss experience of the affected business line

- 3.38.59 A banking institution must have transparent and verifiable processes for collecting relevant data inputs on an ongoing basis, with associated review and approval processes. These processes must be consistent, timely and comprehensive across the bank.
- 3.38.60 Assessments of the appropriateness and relevance of data are to be undertaken on a regular basis and must form the basis of any justification for the exclusion of data from the operational risk measurement system. These assessments must be transparent and clearly documented.
- 3.38.61 To maintain data integrity, a banking institution must have transparent and verifiable processes to review and approve data adjustments as circumstances require. Such adjustments must be well documented. Where the institution makes material adjustments to data, it must be able to justify to the Reserve Bank that these adjustments are made for the purpose of ensuring that data utilised within the model better reflects the environment in which the banking institution operates.
- 3.38.62 The operational risk data inputs used by a bank in the calculation of its ORRC must be subject to independent review both initially (that is, at the time that AMA approval is sought) and at least annually, to ensure the continued quality of the data and the effectiveness of internal controls. Reviews must include an assessment of the controls surrounding the data collection and maintenance processes, as well as data inspection.

Internal data

- 3.38.63 A banking institution must identify all material operational risk losses consistent with the definition of operational risk detailed in this guideline.
- 3.38.64 The collection of internal loss data is considered to be an essential element to the development and functioning of a credible operational risk measurement system. Internal operational risk loss data (**internal loss data**) must form an integral part of the measurement process for an operational risk measurement system to be credible and sufficiently robust.
- 3.38.65 A banking institution must have documented policies and procedures for assessing the ongoing relevance of historical internal loss data. Policies and procedures must detail when an operational risk event becomes an operational risk loss for the purpose of collection within the operational risk loss database.
- 3.38.66 A banking institution's internal loss data must be comprehensive in that it captures all material losses from all appropriate business activities. The bank must be able to justify that any

excluded activities or losses, both individually and in aggregate, would not have a material impact on the overall estimate of the ORRC.

- 3.38.67 A banking institution's thresholds for the collection of internal loss data must be appropriate.
- 3.38.68 In determining a threshold, an institution must take into account:
- a) its approach to operational risk measurement for regulatory capital purposes;
 - b) the data necessary to justify the predictability and stability of EL offset amounts;
 - c) the use of internal loss data for operational risk management; and
 - d) the administrative requirements placed on the business lines and operational risk resources as a consequence of the data collection and management processes.
- 3.38.69 A banking institution must include in its operational risk loss database all operational risk related losses in excess of its specified loss threshold(s). This includes operational risk losses that have typically been regarded as credit or market risk related losses.
- 3.38.70 A banking institution must collect information on the gross loss amounts, the date of the loss event and any recoveries, as well as descriptive information about the drivers or causes of the loss event. The level of detail of descriptive information should be commensurate with the size of the gross loss amount.
- 3.38.71 A banking institution's data procedures must describe how it will treat, for the purpose of its operational risk loss database and operational risk management and modelling, a series of related operational risk loss events over time.
- 3.38.72 Internally generated measures of operational risk used for regulatory capital purposes must be based on a minimum five-year observation period of internal loss data. When a bank first moves to an AMA, a three-year historical data window may be allowed, subject to written approval by the Reserve Bank.
- 3.38.73 A banking institution must map its historical internal loss data to the relevant Category 1 business activities and Category 1 event type categories detailed in Table 2 below. The criteria used for the bank's mapping process must be documented.

Table 16: Detailed Loss Event Type Classification

Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
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 banking institution error, missed deadline or responsibility Model / system misoperation Accounting error / entity attribution error Other task misperformance Delivery failure Collateral management failure Reference Data Maintenance
		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
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 Organised labour activity
		Safe Environment	General liabilities (slip and fall, etc.) Employee health & safety rules events Workers compensation
		Diversity & Discrimination	All discrimination types
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 Lender liability
		Improper Business or Market Practices	Antitrust improper trade / market practices Market manipulation Insider trading book(on firm's account) Unlicensed activity

Type Category (Level 1)	Definition	Categories (Level 2)	Activity Examples (Level 3)
			Money laundering
		Product Flaws	Product defects (unauthorised, etc.) Model errors
		Selection, Sponsorship & Exposure	Failure to investigate client per guidelines Exceeding client exposure limits
		Advisory Activities	Disputes over performance of advisory activities
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	Unauthorised Activity	Transactions not reported (intentional) Transaction type unauthorised (w/monetary loss) Mismatching 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 book(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 (monetary loss)

3.38.74 A banking institution must develop specific criteria for allocating loss data arising from an operational risk loss event in a centralised function or an activity that spans more than one business line.

3.38.75 A banking institution must have a well-defined policy for the classification and regulatory capital treatment of operational risk-related credit risk and market risk losses.

3.38.76 This policy should be applied consistently across the institution.

3.38.77 Operational risk losses that are related to providing credit – that is, losses that arise from the purported exercise of a credit delegation – must, consistent with the scope and definition of operational risk and loss event types, be flagged within a banking institution's internal operational risk loss database. The materiality of these operational risk-related credit losses may vary within a banking institution across business lines and event types. Materiality thresholds should be set with reference to the internal credit risk management processes.

- 3.38.78 Operational risk-related credit losses must be treated as credit risk for the purpose of calculating minimum capital requirement with the exception of fraud (perpetrated by parties other than the borrower), which must be treated as operational risk for the purpose of calculating minimum regulatory capital.
- 3.38.79 Operational risk events that are related to market risk must be reflected in the operational risk profile at the time of discovery (even if positions remain open) and recorded in the operational risk loss database. A banking institution must include open positions resulting from operational risk events in its market risk capital requirement calculation.
- 3.38.80 Operational risk losses that are related to market risk must be treated as operational risk for the purpose of calculating minimum ORRC.
- 3.38.81 A banking institution will be required to implement appropriate processes and controls surrounding the collection of internal loss data so as to ensure that data collected is sufficiently complete and accurate. If an accounting date is chosen for recognition in the internal operational risk loss database and a material known loss has not yet been recognised for accounting or legal purposes, the loss must be incorporated into the processes for calculating ORRC.

External data

- 3.38.82 Relevant external loss data must be incorporated into the operational risk measurement system. A banking institution must have in place a systematic and robust process for collecting, assessing and incorporating external loss data into the operational risk measurement system.
- 3.38.83 The use of external loss data must include the consideration of infrequent yet potentially severe operational risk loss events.
- 3.38.84 External loss data must include, where available, data on the gross loss amount and loss event category, information on any recoveries to the extent that these are known, the nature and scale of the operation where the event occurred and any other available information that would assist in assessing the relevance of the loss event to the banking institution.
- 3.38.85 A banking institution must have a systematic process for determining the situations for which external loss data are used and the methodologies used to incorporate the data.

Scenario analysis

- 3.38.86 Scenario analysis must be incorporated into the operational risk measurement system to evaluate exposure to high-severity loss events. The banking institution must collect scenarios that draw upon the knowledge of experienced business managers and risk management experts to derive reasoned assessments of plausible severe losses. This is especially relevant for business activities or types of loss events where internal and external loss data do not provide a sufficiently robust estimate of the banking institution's exposure to operational risk.
- 3.38.87 The set of developed scenarios should be comprehensive and capture all material sources of operational risk across all the banking institution's business activities.
- 3.38.88 The process for developing scenarios must be robust and applied consistently across the banking institution. The institution must have a process in place for reviewing at least on an annual cycle the developed scenarios to ensure they continue to adequately reflect the operational risk profile of the bank. Over time, scenarios must be re-assessed through comparison to actual internal and external loss experience to assess their reasonableness.

Sensitivity analysis

- 3.38.89 A banking institution must have in place a comprehensive and rigorous program of sensitivity analysis of its operational risk measurement model. Sensitivity analysis must include consideration of the sensitivity of the banking institution's ORRC to changes in modelling choices, assumptions and data inputs (including internal data, external data, scenarios and business environment and internal control factors).
- 3.38.90 The results of sensitivity analysis undertaken must be reflected in policies and methodology documentation and be communicated to senior management and the bank's Board, or Board committee, on a regular basis.

Validation

- 3.38.91 A banking institution must have a robust system in place to validate the accuracy and consistency of its operational risk measurement model. This system must be documented. The bank must demonstrate that its validation process enables it to assess the performance of its operational risk measurement model in a meaningful and consistent manner. As part of the validation of its operational risk measurement model, the bank must regularly compare actual loss experience against its estimates for those losses to ensure their reasonableness.

3.38.92 A banking institution must have in place a robust process for validating changes to its operational risk measurement model (including data inputs and information outputs in the model). This would include a systematic process for reviewing the appropriateness of modelling assumptions and for making changes to those assumptions.

Business environment and internal control factors

3.38.93 A banking institution's operational risk measurement system must incorporate indicators of the bank's operational risk profile, as well as other information related to the assessment of the internal control framework. These indicators, termed business environment and internal control factors, are intended to ensure the operational risk measurement system is forward-looking and closely aligned with the quality of control and operating environments. Accordingly, these factors must be responsive to changes in the operational risk profile and reflect potential sources of operational risk.

3.38.94 A banking institution must monitor its business environment and internal control factors. The frequency of such monitoring must reflect the risks involved and the frequency and nature of changes in the operating environment. Monitoring must be an integrated part of a bank's activities with the results of monitoring activities included in regular senior management and the Board, or Board committee, reports.

3.38.95 Each business environment and internal control factor must have reporting thresholds to ensure there is an effective process that can identify key material risks in a transparent manner and enable the bank to react appropriately.

3.38.96 A banking institution must be able to justify its choice of each business environment and internal control factor as a relevant driver of operational risk, based on considerations of historical experience and involving the expert judgement of relevant business areas.

3.38.97 Business environment and internal control factors are required to recognise both improvements and deterioration in the bank's operational risk profile. The operational risk measurement system must capture potential increases in risk due to greater complexity of activities or increased business volume as well as capturing changes in risk due to improvements in internal controls. Changes in the internal processes and risk management procedures should be similarly taken into account.

3.38.98 A banking institution must be able to justify the relationship between changes in its measures of operational risk and changes in its business environment and internal control factors. The

bank must also be able to justify the relative weighting of the various factors within its operational risk measurement system.

3.38.99 Where possible, business environment and internal control factors should be translated into quantitative measures that lend themselves to verification. The bank will be required to compare its estimates of these factors with actual internal operational risk loss experience.

Risk mitigation

3.38.100 To recognise insurance as an operational risk mitigant, a banking institution must be able to demonstrate that the insurance will cover potential operational risk losses included in the operational risk measurement model in a manner equivalent to holding ORRC. This will require that the insurance coverage satisfy the following criteria:

- a) the cancellation period of the insurance policy must not be less than 90 days;
- b) the insurance policy must not have any exclusions or limitations of liability for losses or expenses caused by or resulting from:
 - (i) any regulatory or supervisory action taken by a statutory authority except where the bank has sought and received written approval by the Reserve Bank of the exclusion to be included in the policy; and
 - (ii) liquidation or curatorship proceedings against the bank unless such losses or expenses are incurred prior to the commencement of any such liquidation or curatorship proceedings;
- c) notwithstanding paragraph (b) above, the policy may exclude fines, penalties or punitive damages; and
- d) the insurance must be provided by a third party entity regulated by the Insurance and Pensions Commission or, with the Reserve Bank's approval, any other entity.

3.38.101 A banking institution must have in place policies and procedures for determining the risk mitigating effects of insurance within its operational risk measurement model. The approach adopted must reflect its insurance coverage in a manner that is consistent with its operational risk measurement model.

3.38.102 In addition, a banking institution's approach to insurance risk mitigation under the AMA, must capture the following characteristics of the insurance policy, through appropriate haircuts to the amount of insurance recognition:

- a) the residual term of the policy;

- b) the policy's cancellation terms, including the possibility that the policy could be cancelled before the contractual expiration;
- c) the uncertainty of payment, including the willingness of the insurer to pay the claim in a timely manner and the legal risk that a claim may be disputed; and
- d) any mismatches in the coverage of insurance policies.

3.38.103 In order to be eligible as a risk-mitigant for AMA purposes, the insurance policy must have an initial term of no less than one year. For policies with a residual term of less than one year, the bank must make appropriate haircuts to reflect the declining residual term of the policy. Haircuts range from zero per cent for policies with a residual term of at least 365 days up to a full 100 per cent haircut for policies with a residual term of 90 days or less.

3.38.104 Where an insurance policy has an initial term greater than or equal to one year and the residual term is between 90 and 365 days, the amount of insurance recognition will be subject to the following haircut:

$$(365 - \text{residual term of insurance contract (in days)})/275$$

C) ALLOCATING CAPITAL FOR MARKET RISK

3.39 Introduction

- 3.39.1 This section outlines requirements for ensuring that a banking institution engaging in activities that give rise to risks associated with potential movements in market prices adopts risk management practices and meets regulatory capital that are commensurate with the risks involved.
- 3.39.2 The key requirements are that a banking institution must:
- a) have a framework to manage, measure and monitor market risk commensurate with the nature, scale and complexity of the institution's operations; and
 - b) use the standardized method or a Reserve Bank approved internal model approach to determine the institution's capital requirement for market risk.

Scope

- 3.39.3 The market risk framework applies to banking institution's:
- a) Risks pertaining to interest rate related instruments and equities in trading book positions; and
 - b) banking and trading book positions that give rise to foreign exchange or commodity risks.
- 3.39.4 For the purposes of the market risk framework, no distinction is drawn, in principle, between risks arising from physical positions and from positions in derivative instruments.

Definitions

- 3.39.5 The following definitions are used in this guideline with respect to market risk:
- a) **market risk** - the risk of losses in on- and off-balance sheet positions arising from movements in market prices. Market risk comprises general market risk and specific risk;
 - b) **general market risk** - the risk of loss arising from changes in the general level of market prices or rates. The risk emanates from holding interest rate and foreign exchange rate sensitive positions, equities, foreign exchange and commodities;

- c) **specific risk** - the risk that the value of a security will change due to issuer-specific factors.
- d) **marking-to-model** - any valuation that has to be benchmarked, extrapolated or otherwise calculated from a market input.

Key principles

- 3.39.6 A banking institution planning to operate a trading book must submit for approval a trading book policy statement that specifies those activities that belong in the trading book.
- 3.39.7 A banking institution must allocate positions in financial instruments to its trading book if they are held with trading intent or in order to hedge other elements of the trading book. In allocating positions, the institution must be guided by its trading book policy statement.
- 3.39.8 A banking institution must maintain a framework for prudent valuation practices for trading book positions.
- 3.39.9 A banking institution operating in the foreign exchange, commodities, interest rate or equities markets must ensure that appropriately robust risk measurement and management systems are in place.
- 3.39.10 A bank must hold capital against: (a) market risks arising from positions allocated to the trading book; and (b) all foreign exchange and commodity risks throughout the bank.
- 3.39.11 However, banking institutions in Zimbabwe are not ordinarily permitted to assume equities and commodities risk; as such this guidance is confined to interest rate risk and foreign exchange risk.

3.40 Market Risk Capital Requirement

- 3.40.1 A banking institution must calculate the market risk capital requirement using one of the following methods:
 - a) the standardised method; or
 - b) the internal model approach; or
 - c) a combination of the standardised method and the internal model approach, in which case the capital requirement is the sum of the market risk capital requirements determined under the two methodologies.

3.41 Standardised Method

- 3.41.1 The standardized method comprises a range of approaches for the measurement of market risk arising from trading activities in accordance with predetermined criteria. The market risk capital charge under the standardized measurement method will be an arithmetic summation of the component risk charges.
- 3.41.2 Cognisant of the absence of external credit rating agencies in the country, the Reserve Bank has substituted external credit assessments with supervisory risk grades.
- 3.41.3 The grading system adopted for market risk measurement is consistent with the approach adopted for rating credit exposures under the standardized approach for credit risk.

Interest rate risk

- 3.41.4 The standardized method for measuring the risk of holding or taking positions in debt securities and other interest-rate-related instruments in the trading book covers all fixed-rate and floating-rate debt securities and instruments that behave like them, including non-convertible preference shares. A banking institution must also include interest rate exposures arising from forward foreign exchange transactions and forward sales and purchases of equities and commodities. A bank may include the rho interest rate exposure (exposure to a change in the value of an option due to a change in the interest rate) on foreign exchange, equity and commodity options. Convertible bonds must be treated as debt securities if they trade like debt securities, and as equities if they trade like equities.
- 3.41.5 In determining the capital charge for interest rate risk, a banking institution must separately calculate the charges applying to the **specific risk** of each instrument, irrespective of whether it is a short or a long position, and to the interest rate risk in the portfolio (**general market risk**) where long and short positions in different securities or instruments can be offset.

Specific risk charge

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

Specific risk capital charges for issuer risk

3.41.7 The capital charges for specific risk are outlined the table below.

Table 17 Specific risk capital charges

Categories	Supervisory Scale	External credit assessment	Specific risk capital charge
Government	1 - 4	AAA to AA-	0%
		A+ to BBB-	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)
		BB+ to B-	1.60% (residual term to final maturity exceeding 24 months)
		Below B-	8.00%
		Unrated	12.00%
			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 standardised approach of this Framework, e.g.:	
		BB+ to BB-	8.00%
		Below BB-	12.00%
		Unrated	8.00%

3.41.8 The category “government” will include all forms of government paper including bonds, Treasury bills and other short-term instruments. The Reserve Bank reserves the right to apply a specific risk weight to securities issued by certain foreign governments, especially to securities denominated in a currency other than that of the issuing government.

3.41.9 The *"qualifying" category* attracts risk charges between 0.25% and 1.6% depending on the residual term to financial maturity. This category includes :

- a. Securities issued by public sector entities and multilateral development banks and other securities, subject to supervisory authority, that are deemed to be of

comparable investment quality by the reporting bank;

- b. At the discretion of the Reserve Bank, debt securities issued by banks in countries which have implemented the present Capital Accord. This will be subject to the express understanding that supervisory authorities in such countries undertake prompt remedial action if a bank fails to meet the capital standards set forth in the Accord; and
- c. Debt securities issued by corporate entities that are internally classified as pass or special mention.

3.41.10 The *"other"* category will receive a specific risk charge of 8% for instruments rated 5 and 12% for instruments rated below 5. Both a short position and a long position in these securities are given the same specific risk charge. This category includes *"non-qualifying"* corporate debt (i.e. debt issued by corporate entities that are internally classified substandard, doubtful or loss) and any other interest rate related securities not covered in the *"other securities"* category.

3.41.11 A bank using the internal ratings-based (**IRB**) approach for credit risk may treat debt securities in the credit portfolio as qualifying if:

- a) the securities are rated equivalent³² to investment grade under the reporting bank's internal rating system, and the Reserve Bank has confirmed the rating system complies with the requirements for an IRB approach; and
- b) the issuer has securities listed on a recognised stock exchange.

3.41.12 Securitisation exposures that would be required to be deducted from the bank's capital if they were held in a bank's banking book must also be deducted from capital if they are held in the bank's trading book. Appropriately rated Asset-Backed Securities (ABS) are eligible for the qualifying specific risk charge.

3.41.13 Fund-raising instruments issued, guaranteed or accepted by a bank and included in the trading book only attract the general market risk capital charge and are not eligible for a specific risk³³ charge.

General market risk

³² Equivalent means the debt security has a one-year probability of default (PD) equal to or less than the one year PD implied by the long-run average one-year PD of a security with credit rating grade of three or better

³³ Where the bank has guaranteed or accepted the instrument, capital must also be held against the credit risk of the issuer.

- 3.41.14 The capital charges for general market risk capture the risk of loss arising from changes in market interest rates. A bank using the standardized approach may either use the maturity method or apply to the Reserve Bank for written approval to use the duration method for measuring general market risk. A bank that has approval to use the duration method must do so on a continuing basis, unless a change in method is approved in writing by the Reserve Bank. In each method, positions are allocated across a maturity ladder and the capital charge is calculated as the sum of three 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’); and
 - c) a larger proportion of the matched positions across different time bands (the ‘horizontal disallowance’).
- 3.41.15 A bank must use separate maturity ladders for positions in each currency, with capital charges calculated separately for each currency and then summed. No offsets are allowed between positions of different currencies. Where business in one or more currencies is insignificant (residual currencies), the bank may construct a single maturity ladder for those currencies and record, within each appropriate time band, the net long or short position in each currency, rather than having to use separate maturity ladders for each currency. The bank must sum the absolute value of the individual net positions within each time band, irrespective of whether they are long or short positions, to produce a gross position figure.
- 3.41.16 In the maturity method, long or short positions in debt securities and other sources of interest rate exposures, including derivative instruments, are entered into a maturity ladder comprising thirteen time bands (or 15 time bands in the case of low-coupon instruments) (refer to Table 2). A bank must allocate fixed-rate instruments according to the residual term to maturity and floating-rate instruments according to the residual term to the next repricing date.
- 3.41.17 Zero-coupon bonds and bonds with a coupon of less than three per cent must be entered according to the time bands set out in the second column of Table 2. A bank may omit from the interest rate maturity framework opposite positions of the same amount in the same issue (but not positions in different issues by the same issuer).

Table 18 Time bands and risk weights

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

Table 19 Horizontal disallowances

Zones ³⁴	Time band	Within the zone	Between adjacent zones	Between zones 1 and 3
Zone 1	0 – 1 month	40%	1 – 3 months 3 – 6 months 6 – 12 months	40% 100% 40%
Zone 2	1 – 2 years	30%	2 – 3 years 3 – 4 years	
Zone 3	4 – 5 years	30%	5 – 7 years 7 – 10 years 10 – 15 years 15 – 20 years Over 20 years	

3.41.18 To calculate the general market risk capital charge using the maturity method, a bank must:

- a) weight the positions in each time band by the risk-weight corresponding to the position’s time band (refer to Table 2);
- b) offset the weighted longs and shorts within each time band, where weighted positions arising from low-coupon instruments are combined with other weighted positions across corresponding time bands;
- c) offset the weighted longs and shorts within each zone (refer to Table 3), using only positions that have not been already been offset under (b);
- d) offset the weighted longs and shorts between zones using positions that have not already been offset under (b) and (c).
- e) The net amount remaining after the above offsets is the net position.

3.41.19 A bank must then calculate the vertical disallowances for each time band as 10% of the smaller of the offsetting positions determined according to paragraph 3.41.18(b).

3.41.20 Horizontal disallowances are calculate as the sum of:

- a) 40% of the smaller of the offsetting weighted positions within zone 1 determined according to paragraph 3.41.18 (c);

³⁴ The zones for coupons less than three per cent are zero to one year, over one to 3.6 years, and over 3.6 years

- b) 30% of the smaller of the offsetting weighted positions within zones 2 and 3 determined according to paragraph 3.41.18 (d); and
- c) 40% of the smaller of the offsetting weighted positions between zones 1 and 2, and between zones 2 and 3 determined according to paragraph 3.41.18 (d).

3.41.21 Where a bank makes use of the maturity method, the general market risk capital charge is the sum of the net position and the vertical and horizontal disallowances.

3.41.22 In using the alternative method, the duration method, a bank must:

- a) calculate the price sensitivity of each instrument in terms of a change in interest rates of between 0.6% and 1.0% depending on the modified duration of the instrument (refer to Table 2);
- b) enter the resulting sensitivity measures into a duration-based ladder in the fifteen time bands set out in the second column of Table 2;
- c) subject long and short positions in each time band to a five per cent vertical disallowance to capture basis risk; and
- d) carry forward the net positions in each time band for horizontal offsetting subject to the disallowances (refer to Table 3).

3.41.23 A bank must subject the gross positions in each time band for residual currencies to either the risk weightings in Table 2 if positions are reported using the maturity method, or the assumed changes in yield in Table 2, if positions are reported using the duration method.

Pre-Processing Techniques

3.41.24 A bank may use alternative methods to calculate the positions to be included in the maturity or duration ladder, subject to the Reserve Bank determining in writing that it is satisfied as to the accuracy of the systems being used. Such formulae may be applied to all interest-rate-sensitive positions, arising from physical instruments. A bank may only use an alternative treatment if:

- a. the positions calculated fully reflect the sensitivity of the cash flows to interest rate changes and are entered into the appropriate time bands; and
- b. the positions allocated to a single maturity ladder are denominated in the same currency.

3.41.25 A bank may combine positions calculated using a pre-processing method with any weighted positions calculated using the duration method but must not offset such positions against weighted positions.

Foreign exchange risk

- 3.41.26 This section sets out a minimum capital standard to cover the risk of holding or taking positions in foreign currencies, including gold.
- 3.41.27 Two steps are employed in calculating the capital requirement for foreign exchange risk. The first step involves measuring the exposure in a single currency position and the second step involves measuring the risks inherent in a bank's mix of long and short positions in different currencies.
- 3.41.28 The capital charge for foreign exchange risk is 8% of the foreign exchange net open position plus 8% of the net position in gold.

Measuring currency exposure

- 3.41.29 For the purpose of calculating its market risk capital, a banking institution must include in its measurement of exposure to each currency the following:
- a) the net spot position, i.e. all asset items less all liability items, including accrued interest and other accrued income and accrued expenses, denominated in the currency in question;
 - b) 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, the principal on currency swaps not included in the spot position, and interest rate transactions such as futures and swaps denominated in a foreign currency;
 - c) guarantees (and similar instruments) that are certain to be called and likely to be irrecoverable; and
 - d) any other item representing a profit or loss in foreign currencies.
- 3.41.30 A bank may also include in its measurement of currency exposure unearned but expected future interest and anticipated expenses if the amounts are certain and the bank has hedged them against adverse movements in rates. If a bank includes future income/expenses, it must not select only expected future flows which reduce its position but must treat all flows on a consistent basis.

3.41.31 If a bank has deliberately taken a position to either partially or totally hedge against the adverse effect of the exchange rate on its capital ratio, it may exclude the position from the measurement of exposure if:

- a) the position is of a ‘structural’ (refer to paragraph 3.41.32) or non-trading, nature;
- b) the ‘structural’ position does no more than protect the bank’s capital adequacy ratio;
- c) the position cannot be manipulated for speculative or profit-driven purposes; and
- d) any exclusion of the position is applied consistently, with the treatment of the hedge remaining the same for the life of the assets or other items.

3.41.32 A structural position includes:

- a) any position arising from an instrument which qualifies as capital of the bank under; or
- b) any position entered into in relation to the net investment in a self-sustaining subsidiary, the accounting consequence of which is to reduce or eliminate what would otherwise be a movement in the foreign currency translation reserve; or
- c) investments in foreign subsidiaries or associates that are fully deducted from an institution’s capital for capital adequacy purposes.
- d) 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 neither 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.

3.41.33 Positions in composite currencies need to be separately reported but, for measuring banks’ open positions, may be either treated as a currency in their own right or split into their component parts on a consistent basis.

3.42 The Internal Model Approach

3.42.1 The internal models approach is an alternative methodology for calculating capital for market risk. The use of internal models is conditional upon the explicit approval of the Reserve Bank. This method allows a banking institution to use risk measures derived from its own internal risk management models, subject to a set of conditions, namely:

- a) certain general criteria concerning the adequacy of the risk management system;
- b) qualitative standards for internal oversight, by management, of the use of internal models;

- c) guidelines for specifying an appropriate set of market risk factors (i.e. the market rates and prices that affect the value of banks' positions);
- d) quantitative standards setting out the use of common minimum statistical parameters for measuring risk;
- e) guidelines for stress testing; and
- f) validation procedures for external oversight of the use of models.

Key requirements

- 3.42.2 The internal model approach is based on the use of value-at-risk (**VaR**) techniques. However, a bank may seek Reserve bank's written approval to use a capital calculation methodology other than VaR.
- 3.42.3 A bank using an internal model must meet, on a daily basis, a capital requirement expressed as:
- a) the higher of:
 - i) an average of the daily VaR measures on each of the preceding sixty trading days, multiplied by a scaling factor of 3 (the total of a multiplication factor and a plus factor; and
 - ii) its previous day's VaR number; and
 - b) the incremental default risk charge (where the VaR measures referred to in paragraph 3.42.2 include an estimation of the specific risk charge in accordance with paragraphs 3.49.9 to 3.49.19).
- 3.42.4 A bank may apply for written approval from Reserve Bank to use an internal model for capital adequacy purposes.
- 3.42.5 Reserve bank may, in writing, approve the use of an internal model by a bank. The model approval may specify how the internal model is to apply in relation to the institution. Reserve Bank's prior written approval is required for any material changes to the market risk internal model. Prior notification to Reserve Bank is required for material changes to other components of the market risk management framework. However, the Reserve Bank may impose conditions on the model approval.
- 3.42.6 Once a bank has obtained model approval, it must continue to employ that internal model on an ongoing basis unless, or except to the extent that, the model approval is revoked or suspended in respect to some or all of the bank's market risk exposures. A return, at the bank's

request, to the standard method to market risk will generally only be permitted in exceptional circumstances.

- 3.42.7 Reserve Bank may, at any time in writing to the Bank, vary or revoke a model approval, or impose additional conditions on the model approval if it determines that:
- a. the Bank does not comply with this guideline; or
 - b. it is appropriate, having regard to the particular circumstances of the Bank, to impose the additional conditions or make the variation or revocation.
- 3.42.8 Where a Bank's model approval has been varied or revoked, Reserve Bank may, in writing, require the bank to revert to the standard method to measure market risk for some or all of its market risk exposures, until it meets the conditions specified by Reserve Bank for returning to the internal model approach.
- 3.42.9 A Bank that has received model approval from the Reserve Bank may rely on its own internal estimate (based on the approved market risk measurement model) of market risk for determining its market risk capital requirement. That estimate must be fundamentally sound and consistent with the scope of market risk defined in paragraph b) of this guideline.
- 3.42.10 Reserve Bank may, in writing, require a bank to reduce its market risk or increase its capital if the Reserve Bank considers that the bank's capital for market risk is not commensurate with the bank's market risk profile.
- 3.42.11 A bank using an internal model for regulatory capital purposes must:
- a) have a market risk management system that is conceptually sound and implemented with integrity;
 - b) have sufficient numbers of staff skilled in the use of sophisticated models in the trading, risk control, audit and back-office areas;
 - c) have a proven track record of reasonable accuracy in measuring risk; and
 - d) regularly conduct stress tests.
- 3.42.12 A bank must also be able to participate in testing exercises to provide any additional information required to satisfy the Reserve Bank of the adequacy of the internal model (both prior to model approval and subsequently if the Reserve Bank wishes to review the internal model).

Qualitative Standards

- 3.42.13 A bank must have an independent risk control unit that is responsible for the design and implementation of the bank's market risk management system. The risk control unit must produce and analyse daily reports on the output of the bank's risk measurement model, including an evaluation of limit utilisation. This risk's control unit must be independent from business trading and other risk-taking units and must report directly to senior management of the bank.
- 3.42.14 The risk control unit must conduct a back-testing program at least quarterly that complies with the minimum requirements in paragraphs 3.50.1 to 3.50.7.
- 3.42.15 The Board, or a Board committee, and senior management of a bank must be actively involved in the risk control process and must treat risk control as an essential aspect of the business, to which significant resources need to be devoted. 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.
- 3.42.16 A bank's internal market risk measurement model must be closely integrated into the day-to-day risk management process of the banks. Accordingly, the output of the model must be an integral part of the process of planning, monitoring and controlling the bank's market risk profile.
- 3.42.17 A bank's market risk measurement system must be used in conjunction with internal trading and exposure limits. A bank's trading limits must be related to the bank's VaR measurement model in a manner that is consistent, over time, and that is well understood by both traders and senior management.
- 3.42.18 A bank must have a routine and robust program of stress testing as a supplement to the risk analysis based on the day-to-day output of the risk measurement model. The results of stress testing exercises must be used in the internal assessment of capital adequacy and reflected in the policies and limits set by management and the Board, or Board committee. The results of stress testing must be routinely communicated to senior management and, periodically, to the bank's Board, or a Board committee.
- 3.42.19 A bank's risk measurement system must be well documented. A bank must have a routine for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system.

3.42.20 A bank must ensure that an independent review of the risk measurement system and overall risk management process is carried out initially (i.e. at the time when model approval is sought) and then regularly as part of the bank's internal audit process. This review must be conducted by functionally independent, appropriately trained and competent personnel, and must take place at least once every three years or when a material change is made to the framework. The review must cover the activities of both the business trading units and the independent risk control unit and must, at a minimum, specifically address the:

- a) scope of market risks captured by the risk measurement model;
- b) integrity of the management information system;
- c) accuracy and completeness of position data;
- d) verification of the consistency, timeliness and reliability of data sources used to run internal models, including the independence of such data sources;
- e) accuracy and appropriateness of volatility and correlation assumptions, proxy assumptions and (if using the historical simulation approach) calculations of historical rate movements;
- f) accuracy of valuation and risk sensitivity calculations;
- g) verification of the model's accuracy through frequent back-testing;
- h) approval process for risk pricing models and valuation systems used by front- and back-office personnel;
- i) validation of any significant change in the risk measurement process;
- j) adequacy of the documentation of the risk management system and process;
- k) organisation of the risk control unit;
- l) integration of market risk measures into daily risk management; and
- m) process used to produce the calculation of market risk capital.

3.43 Combination of the internal model approach and the standard method

3.43.1 A bank may, subject to the Reserve Bank's written approval, use a combination of the internal model approach and the standard method. In doing so, the bank must comply with the requirements detailed in this section.

3.43.2 A bank must not use a combination of the two methodologies within a particular risk category (e.g. interest rates and foreign exchange) and within the same regional centre without prior written approval from the Reserve Bank.

3.43.3 The Reserve Bank may require a bank that has model approval, but does not cover all risk categories, to extend the internal model to cover other market risk categories.

3.44 Transitional Provisions

3.44.1 All financial institutions which are subject to the market risk capital requirement are initially expected to use the standardised measurement approach before authority is granted by the RBZ for them to use internal models. Where authority has been granted financial institutions will be free to use a combination of the standardised approach and the internal models approach to measure market risk. Normally such “partial” models should cover a complete risk category (e.g. interest rate risk or foreign exchange risk).

3.44.2 Financial institutions which are allowed to use the partial approach will, however, be expected to move towards a comprehensive model over time, i.e. one which captures all market risk categories and the detailed requirements of all market risk categories.

3.45 Governance, Trading Book Policy Statement and Prudent Valuation Practices

Board and Senior Management Responsibilities

3.45.1 A banking institution’s Board of Directors should be responsible for approving strategies and policies with respect to market risk and ensuring that senior management takes the steps necessary to monitor and control these risks.

3.45.2 In particular, the Board must ensure that the bank has adequate systems to identify, measure and manage market risk, including identifying responsibilities, providing adequate separation of duties and avoiding conflicts of interest. A banking institution must ensure that market risk capital requirements are met on a continuous basis and that intra-day exposures are not excessive.

The Trading Book

- 3.45.3 A bank must allocate capital to the trading book positions in financial instruments, including derivative products and other off-balance sheet instruments, that are held either with trading intent or to hedge other elements of the trading book.
- 3.45.4 Positions held with trading intent are those which:
- a) are held for short-term resale; or
 - b) are taken on by the bank with the intention of benefiting in the short-term from actual and/or expected differences between their buying and selling prices, or from other price or interest rate variations; or
 - c) arise from broking and market-making.
- 3.45.5 For a position to be eligible to receive trading book capital treatment, a bank must have:
- a) a clearly documented trading strategy for the position/instrument or portfolios that has been approved by senior management (which must include the expected holding horizon); and
 - b) clearly defined policies and procedures for the active management of positions such that:
 - i). positions are managed on a trading desk;
 - ii). position limits are set and monitored for appropriateness;
 - iii). dealers have the autonomy to enter into and manage positions within agreed limits and according to the agreed strategy;
 - iv). positions are marked-to-market daily and when marking-to-model the parameters are assessed on a daily basis;
 - v). positions are reported to senior management as an integral part of the institution's risk management process; and
 - vi). positions are actively monitored with reference to market information sources and assessments are made of the market liquidity or the ability to hedge positions or the portfolio risk profile; this includes assessments of the quality and availability of market inputs to the valuation process, level of market turnover and sizes of positions traded in the market.
- 3.45.6 To obtain an accurate and fair measure of market risk, a bank may, subject to prior written approval from the Reserve Bank, include within its market risk measure certain non-trading instruments which hedge trading activities. Such instruments will be subject to the credit risk

capital requirements (refer to Modified Standardised Approach for credit risk) but not to specific risk capital charges.

- 3.45.7 A bank that raises funds by the issue of instruments may only include these positions in the trading book if the instrument meets the trading book definition.
- 3.45.8 A bank may only include term trading-related repo-style transactions that it accounts for in its banking book as part of its trading book for regulatory capital purposes if all such repo-style transactions are included. For this purpose, trading-related repo-style transactions are limited to those that meet the requirements of paragraphs 3.45.3 and 3.45.5 and both legs are in the form of either cash or securities that can be included in the trading book. All repo-style transactions are subject to a banking book counterparty credit risk charge regardless of where they are booked.
- 3.45.9 For transactions dealt internally within a bank, the bank:
- a) must either:
 - i). eliminate all internal transactions between portfolios within the trading book before measuring positions exposed to market risk; or
 - ii). include any or all internal deals in their position measurement provided this is done on a consistent basis; and
 - b) must include internal transactions dealt between the trading book and the banking book in the measurement of trading book positions.
- 3.45.10 A bank must ensure that a clear audit trail is created at the time transactions are entered into, to facilitate monitoring of compliance with the criteria by which items are allocated to the trading or banking book.

The Trading Book Policy Statement

- 3.45.11 A bank's trading book policy statement must detail:
- a) the activities the bank considers to be trading and as constituting part of the trading book for the purposes of calculating capital;
 - b) the valuation methodology to be adopted for trading book exposures, including:
 - (i) the extent to which an exposure can be marked-to-market daily by reference to an active, liquid two-way market;
 - (ii) for exposures that are marked-to-model, the extent to which the bank can:

under forward foreign exchange transactions, including currency futures, the principal on currency swaps not included in the spot position, and interest rate transactions such as futures and swaps denominated in a foreign currency;

- g) guarantees (and similar instruments) that are certain to be called and likely to be irrecoverable; and
- h) any other item representing a profit or loss in foreign currencies.

3.45.15 A bank must include in its net open position in each currency in accordance with paragraph 3.41.32;

3.45.16 A bank must separately report positions in composite currencies but, for measuring its open positions, may treat them as either a currency in their own right or as split, on a consistent basis, into their component parts.

3.45.17 A bank may treat currency pairs subject to a binding inter-governmental agreement linking the two currencies as the one currency.

3.45.18 A bank must measure positions in gold in accordance with paragraph.^{35 36} A bank may double-count gold in dollar equivalent amounts, first as a gold exposure and secondly as a US dollar exposure, allowing the US dollar exposure to then be netted against US dollar exposures arising from other activities.

3.45.19 A bank must value forward currency and gold positions at current spot market exchange rates. A bank that bases its normal management accounting on net present values must use the net present values of each forward position, discounted using current interest rates and translated at current spot rates, for measuring its forward currency and gold positions.

Measuring Risk in a Portfolio of Foreign Currency Positions and Gold

3.45.20 Under the standard method, a bank must convert at spot rates the nominal amount (or net present value) of the net position in each foreign currency and in gold into the reporting currency.³⁷ The overall net open position must be measured by aggregating:

³⁵ Where gold is part of a forward contract (the quantity of gold to be received or to be delivered), the interest rate and foreign exchange exposure from the other leg of the contract should be reported as set out in this guideline.

³⁶ A bank must first express gold position (spot plus forward) in terms of the standard unit of measurement (barrel, ounce etc) the net position in gold is then converted at current rates into Zimbabwe dollars.

³⁷ Where the bank is assessing its foreign exchange risk on a consolidated basis, it may be technically impractical in the case of some marginal operations to include the currency positions of a foreign branch or subsidiary of the bank. In such cases the internal limit in each currency

- a. the sum of the net short positions or the sum of the net long positions, whichever is the greater; plus
- b. the net position (short or long) in gold, regardless of whether positive or negative.

3.45.21 A bank must calculate the capital charge as 8% of the overall net open position.

3.46 Prudent Trading Book Valuation Practices

3.46.1 A bank must maintain a framework for prudent valuation practices for trading book positions. The bank must establish and maintain adequate systems and controls sufficient to ensure that its valuation estimates are prudent and reliable. These systems must include:

- a) documented policies and procedures for the process of valuation, including clearly defined responsibilities of the areas involved in determining the valuation, sources of market information and review of their appropriateness, frequency of independent valuation, timing of closing prices, procedures for adjusting valuations and end-month and ad hoc verification procedures; and
- b) clear reporting lines for the business unit responsible for the valuation process. The reporting line must be independent of front office and (unless otherwise approved by the Reserve Bank) ultimately to a Board director.

3.47 Valuation Methodologies

3.47.1 Where possible, a bank must mark-to-market all positions at least daily using readily available, independently sourced close-out prices. The bank must use an appropriate price in accordance with Zimbabwean accounting standards.

3.47.2 If marking-to-market is not possible, a bank must mark-to-model. 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. The Reserve Bank will consider the following in assessing whether a mark-to-model valuation is prudent. When marking-to-model the bank must ensure that:

3.47.3 senior management are aware of the elements of the trading book that are subject to mark-to-model and understand the materiality of the uncertainty this creates in the reporting of the risk/performance of the business;

- a) market inputs are sourced, to the extent possible, in line with market prices, and the

applied to such entities may be used as a proxy for the positions. Provided there is adequate *ex post* monitoring of actual positions against such limits, the limits are to be added, without regard to sign, to the net open position in each currency.

- appropriateness of the market inputs for the particular position being valued is reviewed regularly;
- b) generally accepted valuation methodologies for particular products are used where available;
 - c) where the bank develops the model, it is based on appropriate assumptions, which have been assessed and challenged by suitably qualified parties independent of the development process. The model must also be developed or approved independently of the front office and be independently tested, including validating the mathematics, the assumptions and the software implementation;
 - d) there are formal change control procedures in place and a secure copy of the model is held and periodically used to check valuations;
 - e) its risk management functions understand the weaknesses of the models used and how best to reflect those in the valuation output;
 - f) the model is subject to periodic review to determine the accuracy of its performance; and
 - g) valuation adjustments are made as appropriate.
- 3.47.4 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 must be performed by a unit independent of the dealing room, at least monthly or more frequently (depending on the nature of the market/trading activity).
- 3.47.5 A bank must establish and maintain procedures for considering valuation adjustments/reserves. A bank using third-party valuations or marking-to-model must consider whether valuation adjustments are necessary.
- 3.47.6 A bank must consider the following valuation adjustments/reserves³⁸:
- a. unearned credit spreads;
 - b. close-out costs;
 - c. operational risks;
 - d. early termination;
 - e. investing and funding costs;
 - f. future administrative costs; and

³⁸ Where an amount cannot be created as a position or reserve, the amount may form part of retained earnings not available for distribution, and this amount must be clearly disclosed in accordance with Accounting Standards.

g. model risk, where appropriate.

3.47.7 A bank must consider the need to establish valuation adjustments/reserves for less liquid positions, and to review their continued appropriateness on a regular (at least monthly) basis. It must also consider all relevant factors when determining the appropriateness of valuation adjustments/reserves for less liquid positions. These factors include, but are not limited to:

- a. the amount of time it would take to hedge out the position/risks within the position;
- b. the average volatility of bid/offer spreads;
- c. the availability of independent market quotes (number and identity of market makers);
- d. the average and volatility of trading volumes;
- e. market concentrations;
- f. the ageing of positions;
- g. the extent to which valuation relies on marking-to-model; and
- h. the impact of other model risks.

3.47.8 The valuation adjustments and reserves made under paragraphs 3.47.6 and 3.47.7 must impact Tier 1 regulatory capital and may exceed those made under financial accounting standards. An increase in valuation and reserves will result in a reduction in Tier 1 capital.

3.48 Specification of Market Risk Factors

3.48.1 A bank must specify in its risk management system an appropriate set of market risk factors (market rates and prices that affect the value of the bank's market-related positions) that are sufficient to capture the risks inherent in the bank's portfolio of on-balance sheet and off-balance sheet trading positions.

Interest Rates

3.48.2 A bank must specify a set of risk factors corresponding to interest rates in each currency in which the bank has interest rate sensitive on-balance sheet or off-balance sheet trading book positions. The number of risk factors used must be driven by the nature of the bank's trading strategies. For material exposures to interest rate movements in the major currencies and markets, a bank must model the yield curves for those currencies using a minimum of 6 (six) risk maturity segments.

3.48.3 A bank must specify separate risk factors to capture credit spread risk (e.g. between government bonds and corporate bonds).

Exchange Rates (Including Gold)

3.48.4 A bank must specify risk factors corresponding to the exchange rate between the domestic currency and individual foreign currencies in which its positions are denominated.

3.49 Stress Testing...

3.49.1 A banking institution which uses the internal model approach to meet market risk capital requirements must have a comprehensive stress testing program.

3.49.2 The stress scenarios must 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. Stress tests must shed light on the impact of such events on positions that display both linear and non-linear price characteristics.

3.49.3 The stress tests must incorporate both quantitative and qualitative market and liquidity risk aspects of market disturbances. Quantitative criteria must identify plausible stress scenarios to which a bank could be exposed. Qualitative criteria must emphasise the two major goals of stress testing i.e. evaluate the capacity of the bank's capital to absorb potential large losses and identify steps the bank can take to reduce its risk and conserve capital.

3.49.4 A banking institution's stress testing policy and procedure manuals must contain details on the methodology used to select and to carry out stress tests as well as address :

- a) illiquidity/gapping of prices;
- b) concentrated positions (in relation to market turnover);
- c) one-way markets;
- d) non-linear products/deep out-of-the money positions;
- e) events and jumps-to-defaults; and
- f) other risks that may not be captured appropriately in VaR (e.g. recovery rate uncertainty, implied correlations, or skew risk).

3.49.5 The market shocks applied in the tests must reflect the nature of portfolios and the time it could take to hedge or manage risks under severe market conditions.

3.49.6 A banking institution must ensure that the results of the stress tests are reviewed periodically by senior management and reflected in the policies and limits set by the board, board committee or senior management.

Model Review...

3.49.7 A banking institution must ensure that independent review of the market risk models are undertaken regularly to assess:

- a) whether the internal validation processes are operating in a satisfactory manner;
- b) adequacy of the formulae used in the calculation process and for the pricing of instruments.
- c) the adequacy of the structure of the internal model with respect to the bank's activities and risk profile.
- d) the results of back-testing of internal measurement system to ensure the model provides a reliable measure of potential losses over time;
- e) transparency and accessibility of data flows, specifications, parameters and processes associated with the risk measurement system, and
- f) whether banking institution has processes to ensure internal models are adequately validated by suitably qualified parties independent of the development process to ensure that they are conceptually sound and adequately capture all material risks. This validation must be conducted when the model is initially developed and when any significant changes are made to the model.

3.49.8 A banking institution must validate its internal models on a periodic basis, especially where there have been significant structural changes in the market or changes to the composition of the portfolio that might lead to the model no longer being adequate. As techniques and best practices evolve, a bank must avail itself of these advances. Apart from back-testing, model validation must, at a minimum, also include:

- a) tests to demonstrate that any assumptions made within the internal model are appropriate and do not underestimate or overestimate risk;
- b) the use of additional back-tests; and
- c) the use of hypothetical portfolios to ensure that the model can account for particular structural features that may arise.

Treatment of Specific Risk

- 3.49.9 A bank that uses an internal model to calculate its regulatory capital in respect of general market risk may apply to the Reserve Bank to use an internal model to calculate its specific risk capital requirement. A bank using an internal model to calculate its specific risk capital requirement must comply with the criteria set out in paragraphs 3.42.11 to 3.42.20, and 3.49.10 to 3.49.19.
- 3.49.10 A bank's internal model used to calculate the specific risk capital requirement must:
- a) explain the historical price variation in the portfolios concerned;
 - b) capture concentrations, resulting in higher capital charges for portfolios with higher concentrations, and be sensitive to changes in portfolio composition;
 - c) be robust to an adverse environment;
 - d) be validated through back-testing designed to assess whether both specific and general market risks are being accurately captured;
 - e) capture name-related basis risk; and
 - f) capture event risk.
- 3.49.11 Where a bank is subject to event risk that is not reflected in its VaR measure, because it is beyond the 10-day holding period and 99 per cent confidence interval, the bank must ensure that the impact of such events is factored into its internal capital assessment.
- 3.49.12 A bank's model must conservatively assess the risk arising from less liquid positions and/or positions with limited price transparency under realistic market scenarios. A bank may only use proxies where available data are insufficient or do not reflect the true volatility of a position or portfolio, and only if the proxies are appropriately conservative.
- 3.49.13 A bank must have an approach to capture the regulatory capital default risk in its trading book positions that is incremental to the risk captured by the VaR-based calculation, as specified in paragraph 3.49.14. To avoid double counting a bank may, when calculating its incremental default charge, take into account the extent to which default risk has already been incorporated into the VaR calculation, especially for risk positions that could and would be closed within 10 days in the event of adverse market conditions or other indications of deterioration in the credit environment. Where a bank captures its incremental risk through a surcharge, the surcharge will not be subject to a multiplier or regulatory back-testing, although the bank must be able to demonstrate that the surcharge meets its aim.

- 3.49.14 A bank must be able to demonstrate that its approach meets a soundness standard comparable to that of the IRB approach for credit risk, under the assumption of a constant level of risk, and adjusted where appropriate to reflect the impact of liquidity, concentrations, hedging and optionality. A bank that does not capture the incremental default risk through an internally developed approach must calculate the surcharge through an approach consistent with the standardised approach for credit risk or the IRB approach.
- 3.49.15 Securitisation exposures that would be required to be deducted from the bank's capital if they were held in a bank's banking book must also be deducted from capital if they are held in the trading book.
- 3.49.16 The Reserve Bank may exempt a bank that is a dealer in cash, synthetic or securitisation exposures from the deduction treatment if the bank can demonstrate, in addition to trading intent, that a liquid two-way market exists for; the securitisation exposures; or, in the case of synthetic securitisations that rely solely on credit derivatives, for the securitisation exposures themselves or all their constituent risk components.³⁹ The bank must also have sufficient market data to ensure that it fully captures the concentrated default risk of these exposures in its internal approach for measuring the incremental default risk.
- 3.49.17 A bank using an internal model to measure specific risk must conduct back-testing to assess whether specific risk is being accurately captured. To validate its specific risk estimates, the bank must perform separate back-tests using daily data on sub-portfolios subject to specific risk, being traded debt and foreign currency positions. If a bank decomposes its trading portfolio into finer categories (e.g. emerging markets and traded corporate debt), the bank may retain these distinctions for sub-portfolio back-testing purposes. The bank, however, is required to commit to a sub-portfolio structure; hence, changes to the sub-portfolio structure must be agreed with the Reserve Bank and be made only where there is a business case for such a change.
- 3.49.18 A bank must have a process to analyse exceptions identified through the back-testing of specific risk to ensure that it can correct its models of specific risk in the event that they become inaccurate.

³⁹ For purposes of this section, a two-way market is deemed to exist where there are independent *bona fide* offers to buy and sell so that a price reasonably related to the last sales price or current *bona fide* competitive bid and offer quotations can be determined within one day and settled at such price within a relatively short time conforming to trade custom.

3.49.19 A bank with an unacceptable specific risk model (i.e. where the back-testing results fall within the red zone described in paragraph 3.50.6 must take immediate action to improve the model and to ensure that there is a sufficient capital buffer to absorb the risk that the back-test showed had not been adequately captured.

3.50 Framework for the Use of Back-Testing

3.50.1 A bank's back-testing program must consist of a periodic comparison of its daily VaR measure (based on a one-day holding period) with the realised daily profit or loss ('trading outcome'). The program must include a formal evaluation of instances where trading outcomes are not covered by the risk measures (termed 'exceptions') on at least a quarterly basis, using the most recent twelve months of VaR and profit data. The bank must document all of the exceptions generated from its ongoing back-testing program, including an explanation for the exceptions. A bank must have the capacity to perform back-testing analysis both at the level of the whole portfolio and at the level of sub-portfolios or books or that contain material risk.

3.50.2 A bank must perform back-tests using both actual trading outcomes and hypothetical trading outcomes. Hypothetical trading outcomes are calculated by applying the day's price movements to the previous day's end-of-day portfolio. When performing back-tests using actual trading outcomes, a bank may use clean trading outcomes, i.e. actual trading outcomes adjusted to remove the impact of income arising from factors other than market movements alone, such as fees, spreads and intra-day trading results.

3.50.3 A bank must calculate the number of exceptions for use by the Reserve Bank in developing its supervisory response. For this purpose, the bank must use either the hypothetical trading outcomes or clean trading outcomes as determined in writing by the Reserve Bank. The plus factor to be added to the multiplication factor will be based on the number of exceptions out of the most recent 250 trading days. These plus factors are outlined in Table 4.

Table 20 Plus factors

Zone	Number of exceptions	Plus factor
Green Zone	4 or less	0.00
Yellow Zone	5	0.40
	6	0.50
	7	0.65
	8	0.75
	9	0.85
Red Zone	10 or more	1.00

- 3.50.4 If the results of a bank's back-testing fall within zero to four exceptions (the **green zone**), the bank is not required to add a plus factor to the multiplication factor.
- 3.50.5 If the results of the bank's back-testing fall within 5 to 9 exceptions (the **yellow zone**), the Reserve Bank may, in writing, require the bank to add a plus factor in accordance with Table 4.
- 3.50.6 If a bank's back-testing results in 10 or more exceptions (the **red zone**), the Reserve Bank will require the bank to add a plus factor of 1 to the multiplication factor.
- 3.50.7 The Reserve Bank, in writing, may also require the bank to take appropriate action in addition to the plus factor, depending on the nature of the exceptions. Where the exceptions arise from:
- a) issues with the basic integrity of the model, the Reserve Bank may require the bank to make appropriate corrections to the model or, if there are severe problems relating to the basic integrity of the model, the Reserve Bank may revoke the bank's model approval under paragraph 3.48.3;
 - b) the need for improvement in the accuracy of the model, the Reserve Bank may require the bank to improve its risk measurement techniques; and
 - c) unanticipated market movements, the Reserve Bank may require the bank to recalculate its VaR using volatilities and correlations based on a shorter historical observation period if the shifts in volatilities and/or correlations are deemed to be permanent.

4. SUPERVISORY REVIEW PROCESS

4.1 Introduction

- 4.1.1 As part of the implementation of the Revised Capital Adequacy Framework, the Reserve Bank will conduct the Supervisory Review Process (SRP) on individual banking institutions to assess their capital adequacy and determine if they should hold additional capital to cater for risks that are not covered or adequately covered under the minimum capital requirements.
- 4.1.2 The basic elements of the SRP are already embedded in the Reserve Bank's existing supervisory framework, such as the Risk Based Supervision framework. Thus, the implementation of the SRP will be more of an elaboration and refinement process, rather than a radical change of existing practices.
- 4.1.3 A major feature introduced under the SRP is the use by the Reserve Bank of a more detailed and rigorous assessment framework for setting the minimum CAR of each banking institution taking into account the overall risk profile and risk management systems of individual institutions, the extent to which they are exposed to risks that are outside the realm of the minimum capital requirements and, where applicable, the effectiveness of their Internal Capital Adequacy Assessment Process (ICAAP).
- 4.1.4 This section sets out the approach that the Reserve Bank will adopt in conducting the SRP, including a description of:
- a) the main principles and objectives underlying the SRP;
 - b) the key assessment factors that the Reserve Bank will consider in determining the minimum CAR of individual banking institutions, and the supervisory arrangements and procedures associated with the assessment;
 - c) the supervisory approach to reviewing the ICAAP of banks, including the standards and requirements expected of them; and
 - d) the process for ongoing monitoring of banking institutions' capital adequacy and compliance with the minimum capital requirements.
- 4.1.5 This section of the Basel II technical guideline should be read in conjunction with other supervisory guidelines, including the **Guideline No. 2-2006/BSR Risk Based Supervision Framework**.

Terminology

4.1.6 Abbreviations and other terms used in this section have the following meanings:

- “ICAAP” means the internal capital adequacy assessment process that a bank uses to identify and measure the risks it faces and to assess how much capital is needed to support those risks;
- “CAR” means the capital adequacy ratio as defined in the banking Regulation;
- “IMM approach”, in relation to the calculation of a bank’s market risk, means the method of calculating that risk under the internal models approach.
- “internal capital”, in relation to a banking institution, means the amount of capital which the institution holds and allocates internally as a result of the bank’s assessment of the risks faced by it;
- “IRB approach”, in relation to the calculation of credit risk, means the method of calculating that risk under the internal ratings-based approach;
- “minimum capital requirements” mean the minimum standards and requirements for calculating the amount of capital that a banking institution should hold in respect of its credit, market and operational risks;
- “SRP” means the supervisory review process conducted by the Reserve Bank for the purposes of evaluating and monitoring the capital adequacy of individual banks, and of determining their minimum CAR; and

4.2 Key components of SRP

4.2.1 The SRP conducted on a banking institution typically consists of the following key components:

- a) Review of the institution’s risk profile – the Reserve Bank will form a view of the bank’s overall risk profile as part of the ongoing risk-based supervision, with the purpose of assessing those risk and control factors that may result in additional capital for the banking institution.
- b) Review of the banking institution’s ICAAP – The Reserve Bank will assess banks’ ICAAP as part of the SRP. This review will include a consideration of the assumptions, methodology, coverage and outcome of an institution’s ICAAP, with a view to ascertaining its adequacy and effectiveness;
- c) Determination of banks’ minimum CAR and/or other supervisory measures – the Reserve Bank will consider whether minimum CAR remains appropriate or needs to be changed by applying the assessment framework to the results and findings gathered from the above reviews. The

Reserve Bank may also require the banking institutions to take other actions to rectify any system or control deficiencies identified during the SRP.

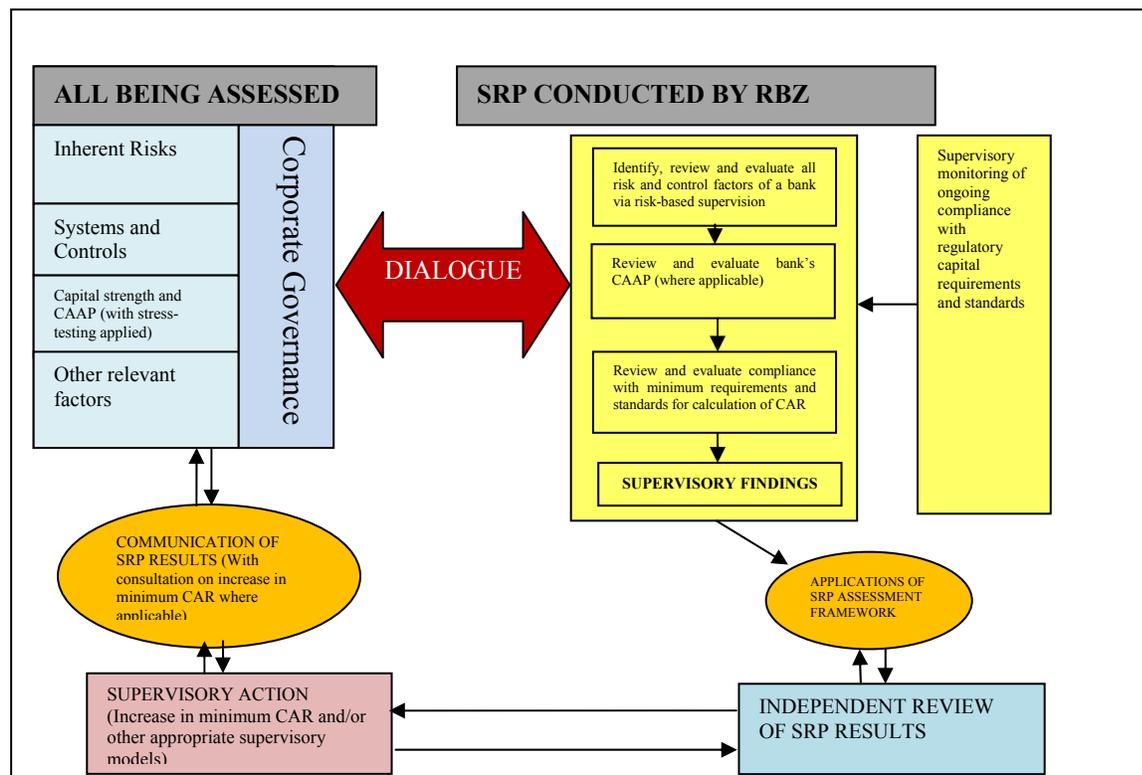
- d) Communication of SRP results to the institution – after completion of the SRP, the Reserve Bank will discuss with the banking institution results of its assessment, including any areas of concern which may lead to an increase in its minimum CAR. The Reserve Bank will explain in sufficient detail the factors which have led to its assessment and recommend what actions the institution should take to address the concerns. If there is a proposed increase in the minimum CAR, the institution will be advised, with the opportunity to make representations.
- e) Ongoing monitoring of the banking institution’s capital adequacy – this is to monitor that the institution complies with the various regulatory capital standards and requirements applicable to it on a continuing basis. The Reserve Bank will update bank’s risk profile regularly, taking into account its progress in addressing any supervisory concerns raised or other events which may significantly affect the institution’s ability to monitor and ensure compliance with the minimum capital requirements.

4.2.2 The SRP will generate an active dialogue with the institution concerned regarding the fulfillment of capital adequacy and risk management standards, through which the Reserve Bank seeks to:

- a) gain deeper insights into the institution’s overall control and risk management framework;
- b) establish a closer understanding of how the institution approaches the risks that are not covered under the minimum capital requirements and the amount of internal capital allocated to them;
- c) understand the mechanisms the institution has maintained for identifying, monitoring and controlling its risks; and
- d) assess the extent to which the institution’s ICAAP, where applicable, may be relied upon as a factor to be considered in the Reserve Bank’s evaluation of the institution’s capital adequacy.

4.2.3 Diagram 1 below provides a graphical presentation of the key components of the SRP described above.

Key Components of SRP



4.3 Supervisory arrangements

- 4.3.1 The Reserve Bank will perform the SRP on each bank regularly (normally once a year) as part of his risk-based supervision. The scope of the SRP will cover all significant business activities of the banking institution, whether operating locally or internationally, on a solo and/or consolidated basis.
- 4.3.2 When carrying out the SRP, the Reserve Bank adopt a forward looking approach to the extent that he will take stock of any significant changes (either arising from institutional or external conditions) to the bank's overall risk profile in the past year and assess how these changes will affect the institution and its business plans and prospects in the coming year. In doing so, the Reserve Bank will take into account the results of any offsite reviews and onsite examinations, and make use of any relevant information obtained from various sources such as prudential interviews, banking returns and routine supervisory contacts.
- 4.3.3 The Reserve Bank will take a proportionate approach when applying the SRP to banking institutions of varying size and complexity. In other words, the frequency, intensity and depth of the SRP will be determined by the potential risk that the institution poses to the supervisory

objectives of the Reserve Bank. For example, the Reserve Bank may subject bank with systemic importance to a more in-depth and comprehensive SRP. For institutions with less complex operations, the Reserve Bank would not expect them to have sophisticated risk management systems and CAAP, and hence the SRP conducted on such institutions is likely to be less intense and frequent. In categorising institutions, the Reserve Bank will take account of factors such as the banking institution's business nature, scale of operations (i.e. size, risk profile and complexity), history of regulatory compliance and significance to financial stability or other supervisory objectives.

4.3.4 The SRP will not replicate the role of the Board and senior management of banking institutions. The primary responsibility for ensuring that a banking institution has adequate capital to support its risk profile still rests with its Board and senior management. The SRP will include a review of the appropriateness of the minimum CAR of a banking institution. The minimum CAR will be set on a solo basis to monitor the institution's capital adequacy on a standalone basis, unless the Reserve Bank's prior approval is obtained for allowing the institution to consolidate some of its subsidiaries in the calculation of a solo-consolidated CAR (i.e. the bank will not be required to deduct its investment in those subsidiaries from its solo capital base) subject to the meeting of certain conditions. If the bank has one or more subsidiaries that are to be consolidated for capital adequacy purposes, the minimum CAR will also be set on a consolidated basis.

4.3.5 The Reserve Bank may involve third parties to assist in conducting the SRP. The Reserve Bank may exercise this power to commission an auditors' report when it considers that an independent assessment of the banking institution's capital adequacy or risk management processes is warranted. To avoid any potential conflict of interest, the external auditor(s) appointed by the bank for the purpose of preparing this report will be approved by the Reserve Bank, and the appointed auditor(s) may not necessarily be the institution's existing auditor(s).

4.4 Application to local banking groups

4.4.1 The Reserve Bank, as the home supervisor of a local banking group, will apply the SRP to the group as a whole, and will monitor the group's capital adequacy at the consolidated level.

4.4.2 The SRP will assess all the major risks of the local banking group, whether arising from banking or nonbanking activities (such as securities dealing or insurance-related business). Other risks to the group will also be captured, for example, where services such as IT,

accounting, or payment and settlement functions are being provided or control functions are being exercised from outside the group on an outsourced basis.

- 4.4.3 The Reserve Bank may allow a local banking group to develop a group CAAP covering the positions of its subsidiary banking institutions if their capital is centrally managed at the group level. In other words, such subsidiary banking institution will not be required to establish their own CAAP on a standalone basis. However, those subsidiary banking institutions that are operating independently will still be required to develop their own CAAP.
- 4.4.4 The Reserve Bank will set a consolidated minimum CAR for a local banking group and a solo minimum CAR for each of the banking institutions within the group based on their individual risk profile. The practice of setting the same CAR at both the solo and consolidated levels will continue unless the results of the SRP justify otherwise.
- 4.4.5 Where a local banking group has cross border subsidiaries the activities of which are significant to the group as a whole, the Reserve Bank may seek the comments of relevant host supervisors on the financial and operating soundness of those branches or subsidiaries in their jurisdictions in the course of conducting the SRP for the consolidated banking group.

4.5 Application to foreign bank subsidiaries

- 4.5.1 In the case of banking institutions which are subsidiaries of foreign banks, the Reserve Bank will continue to set the minimum CAR and to require such banking institutions to maintain adequate capital in Zimbabwe.
- 4.5.2 The evaluation of the capital adequacy of foreign bank subsidiaries under the SRP will however take into account the strength and availability of parental support as well as other relevant information from the home supervisor of the foreign banking group. This may include, for example, the results of the home supervisor's consolidated assessment (including an evaluation of the group CAAP or capital allocation systems and the group support on subsidiaries) of the banking systems and processes used at the group level and any developments or supervisory actions that may affect the calculation of regulatory capital requirements for the subsidiaries in Zimbabwe.
- 4.5.3 A foreign bank subsidiary that is subject to the CAAP standards may employ the CAAP methodology of its parent bank, but will need to explain to the Reserve Bank how the data and methodology have been adjusted to reflect its local business strategy and the risks to which it is exposed in Zimbabwe.

Representations and appeals

- 4.5.4 The Reserve Bank will establish a formal mechanism for ensuring the quality, objectivity and consistency of the assessments performed under the SRP in respect of the determination of the minimum CAR of individual banking institutions and for considering representations from banks seeking a review of the determination.

4.6 Supervisory review of capital adequacy

General ...

- 4.6.1 This section focuses on the major elements of the assessment framework adopted by the Reserve Bank under the SRP, including the key assessment factors that will be considered in evaluating banks' capital adequacy and the approach towards the setting of their minimum CAR.
- 4.6.2 Conducted as part of the Reserve Bank's ongoing supervision of banking institutions, the SRP is closely related to the risk-based supervisory framework currently adopted by the Reserve Bank. The relationship with RBS and how the assessment results under the SRP may be integrated with the risk-based supervisory process are explained below. Also relevant to the SRP are:
- the Reserve bank's approach to using stress tests and scenario analyses in evaluating a banking institution's capital adequacy and its ability to withstand risk;
 - the emphasis placed by Reserve Bank on encouraging banks to adopt international risk management standards and best practices through the issue of supervisory guidance; and
 - the process of monitoring banks' capital adequacy on a continuing basis.

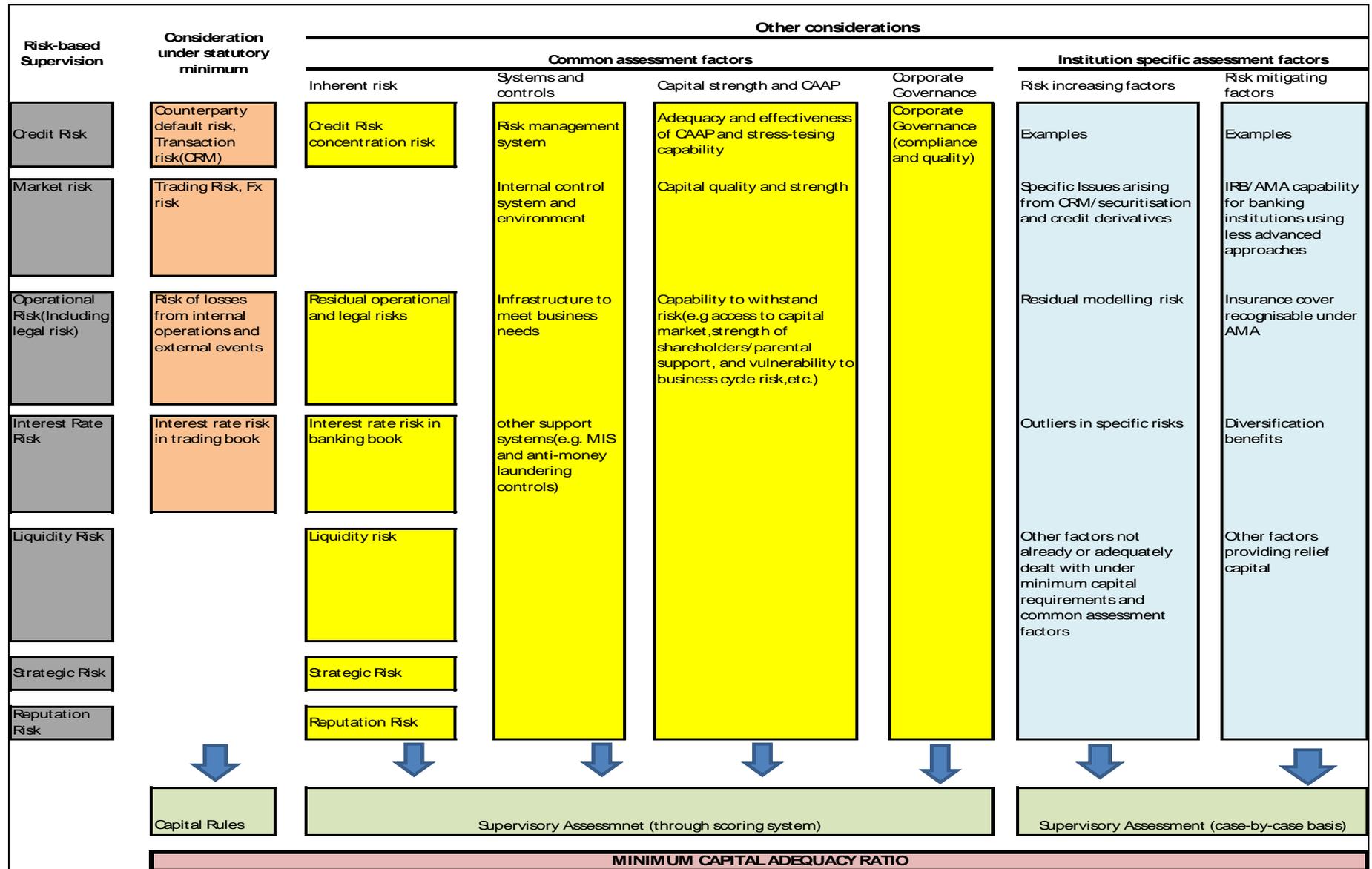
Key factors for assessing capital adequacy ...

- 4.6.3 The SRP broadens the range of risks that will be captured in the revised capital adequacy framework. Apart from credit, market and operational risks that are covered under the minimum capital requirements, the SRP takes into consideration other risks faced by banking institutions and how well those risks are being managed by banks. Through the SRP, the Reserve Bank will evaluate the extent to which an institution is required to hold more capital to cover those risks (i.e. the capital add-on). This subsection serves to specify the major risk

and control factors that the Reserve Bank will consider under the SRP and the approach to assessing the impact of such factors on a banking institution's minimum CAR.

- 4.6.4 With the risk-based supervisory approach as its foundation, the SRP is developed to provide the Reserve Bank with a comprehensive, systematic and consistent framework for determining the minimum CAR of individual institutions. Diagram 3 below outlines the key elements that constitute the assessment framework.

Diagram3



- 4.6.5 Central to the SRP is the Reserve Bank’s assessment of the level of capital that a banking institution should set aside for the eight inherent risks identified for the purpose of risk-based supervision, to which all the assessment factors under the SRP can be linked. These inherent risks (see column 1 of Diagram 3), i.e. credit, market, operational (and legal), interest rate, liquidity, strategic and reputation risks, are as defined in the “Risk-based Supervisory Framework”.
- 4.6.6 In determining the overall risk profile and minimum CAR of a banking institution, the Reserve Bank will take into account two types of assessment factors, i.e. those that are commonly applicable to all banking institutions (referred to as the “common assessment factors”) and those that are specific to the bank concerned (referred to as the “specific assessment factors”). Common assessment factors include inherent risks and other assessment factors set out below.

Level of inherent risks

- 4.6.7 Out of the eight inherent risks, there are certain risks, namely, credit risk (in terms of counterparty default risk and transaction risk), market risk and operational (and legal) risk, that are within the scope of the minimum capital requirements and hence are covered by the statutory minimum of 10% (see column 2). The other inherent risks (including residual risks), as listed below, are to be assessed under the SRP (see column 3):
- credit concentration risk (as a major source of residual credit risk);
 - residual operational (and legal) risk;
 - interest rate risk in the banking book;
 - liquidity risk;
 - strategic risk; and
 - reputation risk.
- 4.6.8 The Reserve Bank will assess a banking institution’s level of inherent risks covered under the SRP, taking into consideration all relevant qualitative and quantitative factors, including their respective significance to the institution’s overall risk profile and the degree of potential loss that may be posed by these risks in relation to the bank’s earnings and capital. The direction of such risks (i.e. “increasing”, “stable” or “decreasing”)⁴⁰, including those arising from new business

⁴⁰ If the level of credit risk is “low” but the direction of this risk is “increasing”, the Reserve Bank may consider whether there is sufficient basis for increasing the level of credit risk to “moderate”.

products or services, in the next 12 months will also be considered. The resultant level of inherent risk will be categorised as “low”, “moderate” or “high”⁴¹.

Other common assessment factors

4.6.9 In addition to the level of inherent risks, the Reserve Bank will assess a bank’s performance under the following assessment factors (see columns 4 to 6) with a view to ascertaining the bank’s ability to manage and mitigate the inherent risks:

- a) **Systems and controls** – this refers to the assessment of a bank’s overall operating soundness, including the adequacy of:
 - risk management systems (i.e. systems used for identifying, measuring, and monitoring the eight inherent risks);
 - internal control systems and environment (including organisation structure, delegation of authority, segregation of duties, control culture, internal audit and compliance functions);
 - infrastructure to meet business needs (such as IT capability, staff competence, and outsourcing); and
 - other support systems (such as MIS, accounting and anti-money laundering controls);
- b) **Capital strength and CAAP** – this refers to the assessment of:
 - the quality of capital held by a banking institution and its access to additional capital and capability to withstand business cycles and other external risk factors (e.g. the impact of mergers/acquisitions, competition or adverse events on the bank’s operations); and
 - the quality and effectiveness of a bank’s CAAP for managing its capital adequacy in relation to its risk profile, particularly the level of capital which enables the bank to stay in business, as well as the overall environment within which the CAAP operates (for banking institutions that are subject to the CAAP standards set out in section 4); and
- c) **Corporate governance** – this refers to the assessment of the adequacy of a bank’s corporate governance arrangements.

4.6.10 In assessing the above factors, the Reserve Bank will pay particular attention to the oversight exercised by the bank institution’s Board and senior management, including their knowledge and experience in risk management, their participation and involvement in development of the bank’s CAAP and risk management processes, and their responsiveness to risk management or control

41 By way of example, the credit concentration risk of an international bank with fairly diversified portfolios by counterparty, sector, or geographical location will likely be regarded as “low” whereas that of a domestic deposit-taking company with a highly concentrated loan portfolio (e.g. with a few large or connected borrowers) will likely be regarded as “high”.

issues raised by the Reserve Bank. The Reserve Bank will also take into account senior management's ability to detect and rectify issues or problems arising from internal operations and to react promptly to changes in the external environment (e.g. due to competition or deterioration in macroeconomic variables) that could adversely affect the bank's overall condition.

- 4.6.11 In relation to the assessment of capital strength, a banking institution's prospects and ability to obtain additional capital readily and the likelihood of it doing so when under stress, the capital support potentially available from the banking institution's shareholders, and the obligations and commitments to which the banking institution may have towards its subsidiaries and affiliates (if any) are relevant factors to be considered. In the case of a banking institution which is a banking subsidiary or a member of a banking group (local or foreign), the Reserve Bank will further consider whether the banking institution has strong parental support and whether the parent bank or holding company has the resources to provide such support when needed.
- 4.6.12 The Reserve Bank will, in evaluating the above factors, have regard to the business nature, scale of operations and systemic importance of institution and their compliance with the supervisory standards and best practices contained in the relevant guidelines. The resultant level of performance of the above factors will be categorised as "strong", "acceptable" or "weak".⁴² A "strong" performance on the above factors will have a positive impact on the overall risk profile of a banking institution, and vice versa.

Specific assessment factors

- 4.6.13 There are two types of specific assessment factors, i.e. risk increasing factors (see column 7) and risk mitigating factors (see column 8). They are used to cater for situations or circumstances specific to the banking institution concerned and which have not been dealt with or adequately dealt with under the minimum capital requirements or common assessment factors. The Reserve Bank will consider these factors on a case-by-case basis, having regard to their significance to individual banking institution. The use of such factors is however exceptional and subject to close scrutiny by the Reserve Bank.

⁴² For example, the Reserve Bank may grade a banking institution's risk management systems as "strong" if the bank's past history indicates that its risk management policies, systems and controls address all material risks and are effectively implemented. However, if subsequent supervisory findings have identified significant flaws in the bank's risk monitoring and reporting procedures to the extent that senior management is not given accurate or adequate information to evaluate the risks faced by the bank, there may be scope for downgrading the risk management systems to "weak".

4.6.14 Risk increasing factors are specific factors that will lead to a negative impact on the minimum CAR of a bank. Examples of such factors include:

- a. significant “outliers” identified in the review of common assessment factors. These may relate to extremely high levels of inherent risk, substantial management or control weaknesses, or significant vulnerability to adverse economic events which warrant a full assessment of the additional capital required to cover the risks involved;
- b. factors specific to the business and operations of a bank, such as business concentration risk and other material non-banking risks (e.g. rapid expansion in non-banking activities without proper expertise and management systems); and
- c. specific issues arising from the application of or compliance with minimum standards or requirements stipulated under the revised capital adequacy framework. These issues may arise from:
 - residual credit risk associated with credit risk mitigation techniques or complex credit derivatives or securitization transactions;
 - use of internal models under the IRB approach or IMM approach (e.g. capital shortfall identified in stress tests, breach of qualifying criteria or certain modelling deficiencies pending rectification); or
 - operational risk capital charge not commensurate with the scale and complexity of bank’s business operations (e.g. due to the bank’s operating losses or significant decline in earnings).

4.6.15 Risk mitigating factors are specific factors that will have a positive impact on the minimum CAR of a banking institution. They are used by banks to improve their risk management so that the level of their inherent risks can be effectively mitigated. As an example, if a bank can demonstrate to the Reserve Bank’s satisfaction its proficiency in managing credit, market or operational risk by having sophisticated risk management systems comparable to those required for adopting the advanced approaches promulgated under Basel II⁴³ (although the systems may not have been used for regulatory capital treatment in Zimbabwe⁴⁴), the Reserve Bank may recognise this as a risk mitigating factor.

⁴³ These approaches refer to the IRB approach for credit risk, the internal models approach for market risk and the Advanced Measurement Approaches (“AMA”) for operational risk as set out in “International Convergence of Capital Measurement and Capital Standards – A Revised Framework (Comprehensive Version)” published by the Basel Committee on Banking Supervision in June 2006.

⁴⁴ An example of such situations is where a foreign-owned banking institution may adopt the standardised approach for the calculation of operational risk in Zimbabwe while using the AMA systems of its parent bank, which has been recognised by the relevant home

- 4.6.16 In considering a bank's minimum CAR, the Reserve Bank will determine, in consultation with the bank concerned, whether there is any risk mitigating factor that can be recognised for capital adequacy purposes. To facilitate its assessment, the Reserve Bank may require the bank to provide any such information or documentary evidence as is deemed necessary in the circumstances of the case. The Reserve Bank will assess each case based on its own merits, taking into account the information provided to justify the risk mitigating effect of the factor under consideration.
- 4.6.17 The Reserve Bank will determine the extent to which the minimum CAR of a bank can be increased or reduced due to the specific assessment factors based on the assessment of the extent to which such factors can increase or mitigate the risks of the bank.

Assessment approach

- 4.6.18 In conducting the assessment under the SRP, the Reserve Bank will use a combination of techniques and tools, which include:
- quantitative and qualitative assessments;
 - scoring of key risk factors and trends;
 - statistical and sensitivity analyses;
 - stress and scenario tests;
 - benchmarking against industry performance; and
 - peer group comparisons.
- 4.6.19 Regardless of the approach taken, supervisory judgement will still be an important element in the overall assessment. The Reserve Bank may also seek the views of the external auditors of a banking institution and, where applicable, its home or host supervisor on particular issues affecting the institution.
- 4.6.20 On the basis of the assessment results, the Reserve Bank will decide upon the overall risk profile (also categorised as “low”, “moderate” or “high”) to facilitate determination of the banking institution's minimum CAR and any other appropriate supervisory response to the bank's conditions (e.g. the scope and frequency of the next SRP or the need for any supervisory action to be taken in view of the weaknesses or deficiencies identified).

supervisor for capital adequacy purposes, for risk management purposes.

- 4.6.21 A banking institution's overall risk profile will be related to the level of inherent risks of the bank (with focus on those captured under the SRP) and its performance in other common assessment factors, i.e. systems and controls, capital strength and capability to withstand risk, CAAP (if applicable), and corporate governance. The effects of any specific assessment factors applicable to the bank will also be taken into account.
- 4.6.22 In order to ensure the quality and consistency of the assessments made, the Reserve Bank will aggregate the assessment results of individual banking institutions and compare the results among peer groups. The assessment results and recommendations will also be subject to the independent review procedures before they are finalised.
- 4.6.23 The Reserve bank will discuss the assessment results in detail with individual banks and consult with them if an increase in their minimum CAR is proposed.

Determination of minimum CAR

- 4.6.24 Under the SRP, the minimum CAR set by the Reserve Bank is made up of the statutory minimum of 10% plus a capital add-on which is deemed necessary to cater for other risks and uncertainties faced by the banking institution. The Reserve Bank may raise the minimum CAR of a banking institution, after consultation with the institution, to up to 16%, meaning that the capital add-on is subject to a maximum of 8%.
- 4.6.25 With the implementation of the SRP, it is in principle possible for a banking institution to be assigned a minimum CAR of 10% (i.e. with no capital add-on required) if the Reserve Bank is satisfied that the bank is well diversified with strong business, management, systems and controls, and all of its material risks are adequately covered by the statutory minimum. Other institutions that do not fall within this category will be required to hold a capital add-on in excess of the statutory minimum, the size of which is governed by the results of their SRP.
- 4.6.26 The minimum CAR of a bank will reflect the Reserve Bank's perception of its overall risk profile, taking into account all the relevant assessment factors. The factors may have different levels of significance to different banks, depending on their individual circumstances.
- 4.6.27 Broadly, a banking institution will be assigned with a minimum CAR that falls within the following categories, depending on their assessment results under the SRP:

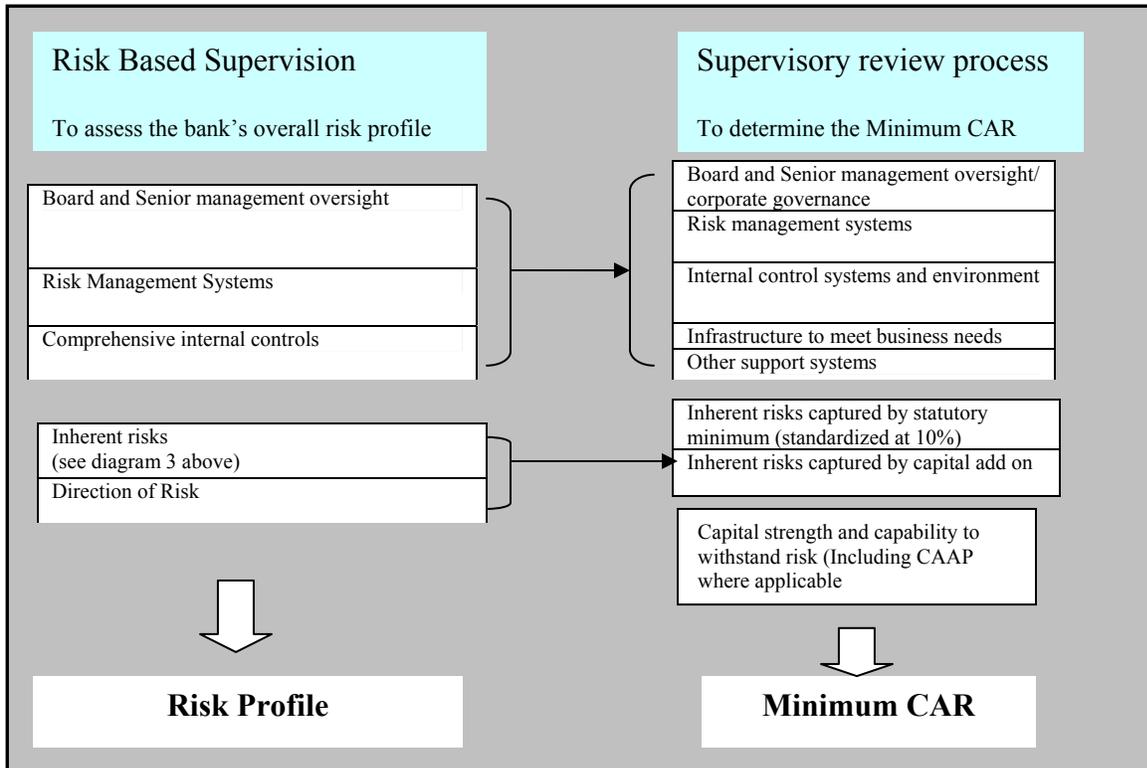
Overall risk profile	Minimum CAR
Low	8% - 9%
Moderate	>9% -12%
High	>12% -16%

- 4.6.28 The minimum CAR will be set at a multiple of 0.5% in the light of the more risk-sensitive approach adopted under the SRP. To reduce frequent fluctuations in the minimum CAR, the Reserve Bank will consider whether the factors leading to a change in the minimum CAR are temporary in nature or require further observation. For example, if there are reasonable expectations that certain system deficiencies will be quickly rectified by a bank, the Reserve Bank may consider withholding temporarily the proposed increase in minimum CAR pending a review of the corrective actions. Conversely, if a reduction in a bank's minimum CAR is proposed in light of the actions taken to address supervisory concerns raised by the Reserve Bank, the Reserve Bank may consider withholding temporarily the proposed reduction until a more comprehensive assessment of whether the improvements have been effectively implemented is completed.
- 4.6.29 While the setting of an appropriate minimum CAR for individual banking institutions is an important aspect of the SRP, the Reserve Bank recognises that capital alone is not a substitute for sound risk management and control environment. In fact, certain risks may not be adequately addressed by holding additional capital alone. A more appropriate response would be to mitigate a risk by way of adequate systems and controls, or by a combination of adequate systems and controls and additional capital.
- 4.6.30 In certain circumstances (e.g. during the period in which system and control weaknesses have been identified but have yet to be fully remedied), the Reserve Bank may make use of an increase in regulatory capital as a supervisory tool to focus the minds of management of a banking institution on the need for improving risk management and rectifying control deficiencies. Thus, the Reserve Bank may increase the banking institution's minimum CAR temporarily and, where necessary, take other appropriate supervisory actions (e.g. requiring the institution to reduce the risk inherent in its activities, products and systems), pending corrective actions by the bank.

4.7 Integration with risk-based supervisory process

4.7.1 Diagram 4 below illustrates the relationship between the SRP and the risk-based supervisory process.

Diagram 4 – Relationship between SRP and Risk-based Supervision



4.7.2 The Reserve Bank has identified eight inherent risks (i.e. credit, market, interest rate, liquidity, operational, legal, reputation and strategic) for the purpose of risk-based supervision, which is a dynamic and forward-looking approach used for assessing a banking institution's risk profile (ascertained by balancing the level of the eight inherent risks with the quality of risk management systems for each of these risks).

4.7.3 With the implementation of the SRP, the risk-based supervisory framework for evaluating an banking institution's overall risk profile will be further enhanced by a comprehensive assessment under the SRP of all relevant factors before the resultant risk profile of the bank is derived. This enhanced framework will also form the basis for determining the bank's minimum CAR.

4.7.4 The Reserve Bank's assessment of a banking institution's capital strength and capability to withstand risk (including a review of CAAP where applicable) is conducted as part of the SRP.

The results of this assessment will supplement the risk-based supervisory process by providing analyses on the bank's capital strength and earning capacity.

- 4.7.5 The Reserve Bank will streamline the risk-based supervisory process to encompass evaluation of the SRP and integrate the assessment results for determination of a bank's risk profile and minimum CAR.

4.8 Use of stress and scenario tests

Role of stress-testing under SRP...

- 4.8.1 An important aspect of the SRP is to assess the potential vulnerability of a banking institution to adverse events or other external factors (e.g. business cycle risk) and the need for the bank to hold additional capital for such risk. In performing this assessment under the SRP, the Reserve Bank will have regard to the results of stress tests and scenario analyses conducted by the institution, which may provide useful information about the effects of "stressed" situations on the bank's financial condition, particularly the impact on its asset quality, profitability and capital adequacy.
- 4.8.2 A stress test typically involves shifting the values of individual risk factors (e.g. worsening of credit spreads or adverse changes in interest rates or other macroeconomic variables) that affect the bank's financial position and determining the effect of such changes on its business. Stress-testing results can be used by an institution to determine the appropriate appetite for different types of risks and estimate the amount of capital that should be set aside to cover them.
- 4.8.3 A scenario analysis measures the combined effect of adverse movements in a wider range of risk factors affecting a bank's business operations at the same time (e.g. an economic recession coupled with a tightening of market liquidity and declining asset prices). Stress scenarios may be derived from stochastic models or historical events, and can be developed with varying degrees of precision, depth and severity.
- 4.8.4 Both stress tests and scenario analyses will improve a bank's understanding of the vulnerabilities that it faces under exceptional, but plausible, events. These events can be financial, operational, legal or relate to any other risk that may have an economic impact on the institution concerned.

Stress-testing obligations on banking institutions

- 4.8.5 Under the SRP, banking institutions are expected to carry out regular stress tests and scenario analyses that are appropriate to the nature of their business and the major sources of risk faced by them for risk management purposes. The Reserve Bank will assess the effectiveness of a banking

institution's stress-testing programme as part of its review of the institution's risk management systems.

- 4.8.6 Banking institutions should integrate relevant stress-testing results into their CAAP so as to ensure that there is sufficient capital to withstand the impact of possible adverse events or changes in market conditions on them. The Reserve Bank will take into account the stress-testing approach adopted by the banking institution (including the methodologies and assumptions used) and consider the extent to which the banking institution has provided for unexpected events in setting its capital level.
- 4.8.7 In addition, banking institutions using the IRB approach to calculate credit risk or the IMM approach to calculate market risk are required to conduct respectively credit risk or market risk stress tests in compliance with the respective minimum capital requirements. The Reserve Bank will review the stress-testing results to ascertain whether banking institutions have sufficient capital to meet the minimum capital requirements and cover such results.
- 4.8.8 If the Reserve Bank is not satisfied with a banking institution's capital adequacy after taking into account its stress-testing results, the Reserve Bank may consider increasing the banking institution's minimum CAR and/or require the banking institution to reduce its risks. Where necessary, other appropriate supervisory measures may also be taken.

Supervisory stress tests

- 4.8.9 In reviewing banking institutions' capability to withstand risk, the Reserve Bank will conduct sector-wide stress tests to assess and compare individual banking institutions' vulnerability to the same set of severe market shocks or crisis situations, making use of the statistical data provided by banking institutions or results generated from their stress tests.
- 4.8.10 Other stress tests will also be applied where appropriate. For example, the Reserve Bank will apply liquidity stress tests based on the quarterly cash flow data submitted by them to assess their vulnerability to liquidity crises or bank-run situations when determining the level of their liquidity risk.
- 4.8.11 The Reserve Bank will consider whether those "outlier" banking institutions that show significant vulnerability to "stressed" situations compared with their peers warrant a higher minimum CAR and/or a reduction in risk exposures.

4.9 Supervisory guidance on risk management practices

4.9.1 A key feature of the SRP lies in its emphasis on the comprehensive recognition of risk in a banking institution's capital planning and management processes. Apart from requiring banking institutions to maintain adequate capital to support the risks they undertake, the SRP encourages them to develop and use better risk management techniques for monitoring and controlling such risks, especially those specific risks not directly or fully addressed under the minimum capital requirements.

4.9.2 The Reserve Bank will continue to develop or enhance supervisory guidelines on risk management and control standards applicable to the SRP with a view to:

- encouraging banking institutions to adopt international standards and best practices in managing their risks;
- enabling them to be better prepared for meeting the relevant standards under the SRP; and
- ensuring a consistent application of the standards.

4.9.3 This will make the SRP more risk-sensitive in terms of matching regulatory capital requirements to the risks taken by banking institutions, and help mould regulatory capital requirements to the way in which banking institutions manage their business.

4.10 Ongoing monitoring of capital adequacy

4.10.1 The Reserve Bank will perform ongoing evaluation and monitoring of banking institutions' capital adequacy, including their compliance with the qualifying criteria of the relevant approaches adopted by them under the revised capital adequacy framework. For example, these may relate to the use of the IRB approach and the IMM approach or the recognition of credit risk mitigation techniques and securitization transactions for capital adequacy purposes.

4.10.2 If a banking institution is found to have a continuing decline in its capital level, the Reserve Bank will require the banking institution to provide a capital restoration plan and the timetable for doing so. The Reserve Bank will establish an action plan to monitor the banking institution closely. If the banking institution's capital is not maintained or restored within the specified timeframe, the Reserve Bank may take other appropriate supervisory actions, such as restricting the banking institution from business expansion or limiting its business, operations or network, pending restoration of the capital to an adequate position.

4.10.3 If the findings gathered from ongoing offsite reviews or onsite examinations reflect concerns about a banking institution's compliance with certain qualifying criteria or conditions under the

minimum capital requirements, the Reserve Bank may seek further explanations from the banking institution or conduct a more detailed examination to assess the concerns. If necessary, the Reserve Bank may commission a special review.

- 4.10.4 As banking institutions have an obligation to manage their capital and ensure that it is sufficient to cover the risks undertaken by them, they are expected to maintain internal monitoring systems (e.g. through internal validations or audits) to ensure that their capital does not fall below prudent levels, and that they continue to meet the minimum standards required for the use of particular approaches or methodologies under the minimum capital requirements.
- 4.10.5 The Reserve Bank would expect banking institutions to advise him of any significant decline in capital levels or non-compliance with certain standards or criteria under the minimum capital requirements (and the causes of such decline or noncompliance) and the remedial actions to be taken as soon as practicable. In the event that a banking institution's capital falls below the minimum CAR or trigger ratio, the banking institution should set out a plan for restoring its capital position. Depending upon the circumstances and frequency with which these situations occur, the Reserve Bank may regard them as indicative of system and control weaknesses.

4.11 Supervisory standards on CAAP

General

- 4.11.1 Under the SRP, banking institutions are expected to have a CAAP for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels, unless otherwise exempted by the Reserve Bank. The CAAP should fit their individual circumstances and needs, having regard to the risk profile and level of sophistication of their operations. The Reserve Bank has the responsibility of evaluating banking institutions' CAAP and their capital adequacy through the SRP, the results of which will be taken into account in determining their minimum CAR.
- 4.11.2 This section sets out the Reserve Bank's approach to reviewing banking institutions' CAAP and the supervisory standards expected of such CAAP. The requirements for conducting CAAP are applicable to all banking institutions except for the following:
- banking institutions that have been approved by the Reserve Bank for adopting the basic approach permanently are not subject to the CAAP standards in the light of their small and simple operations. Nevertheless, they remain responsible for ensuring that there is sufficient capital to meet their business and operational needs; and
 - banking institutions that are subsidiaries of a local banking group are not required to

establish their own CAAP if their capital is managed on a group basis and incorporated into the group CAAP.

- 4.11.3 The Reserve Bank recognises that there is no single correct approach to conducting the CAAP. As such, the focus of the Reserve Bank is on providing high level guidance rather than prescriptive criteria on CAAP methodologies or techniques that should be employed. This also takes into account the fact that market consensus on what constitutes best practice for conducting the CAAP has yet to be emerged, and the development of relevant methodologies and techniques (e.g. on how non-quantifiable risks such as reputation and strategic risks are to be measured) is still evolving. The onus, therefore, is on banking institutions to explain and demonstrate how their CAAP meets supervisory standards, and why they consider their capital targets appropriate given the scale and complexity of their business.
- 4.11.4 While the Reserve Bank will assess the reasonableness of banking institutions' CAAP outcome in his review, there is no attempt on the part of the Reserve Bank to reconcile the difference between the minimum CAR set by the Reserve Bank and the outcome of a banking institution's CAAP, as regulatory and economic capital⁴⁵ are essentially two different concepts and the objectives that they serve may not be entirely the same. Nevertheless, reviewing a banking institution's CAAP outcome will help the Reserve Bank to better understand the banking institution's capital management systems and strategies.
- 4.11.5 Banking institutions may have different capital adequacy goals (e.g. some may target for a certain credit rating). At a minimum, the Reserve Bank would expect a banking institution to establish a CAAP to assess the capital needed to cover all material risks, achieve its business plan and enable it to stay in business (with sufficient core capital to protect itself from insolvency).
- 4.11.6 Although there will not be a stringent deadline for banking institutions to comply fully with the CAAP standards set out in this section, the Reserve Bank may, where appropriate, take into account the effectiveness of a banking institution's CAAP in the setting of minimum CAR for that banking institution. The CAAP will also enable a banking institution to measure its risks and allocate capital against such risks more precisely. It is therefore in the interest of banking institutions to enhance their CAAP capabilities as soon as practicable.

⁴⁵ There is as yet no standardised definition for economic capital within the banking community. However, generally speaking, economic capital is more concerned with shareholders' funds than with other sources of subordinated funding (i.e. the amount of losses that can be absorbed before shareholders' funds are exhausted) and hence is more akin to the nature of core capital. Nevertheless, the approach to evaluating economic capital may differ among banking institutions depending on the capital objective or the desired level of confidence interval set. Regulatory capital goes beyond the amount needed for survival and includes supplementary capital (which serves as an additional protective cushion for depositors).

Board and senior management oversight

- 4.11.7 The Board and senior management of a banking institution have the primary responsibility for ensuring that the banking institution has adequate capital to support its risks. At a minimum, the capital required should enable the banking institution to operate as a going concern and be sufficient to provide for business growth.
- 4.11.8 To meet this responsibility, the Board and senior management, among other things, should:
- a. establish a capital policy which, at a minimum, includes :
 - the banking institution’s capital adequacy goals in relation to its risk profile, taking into account its strategic focus and business plan;
 - the approved capital targets that are consistent with the banking institution’s overall risk profile and financial position; and
 - measures that would be taken in the event capital falls below a targeted level;
 - b. maintain other policies, to supplement the capital policy, in relation to :
 - risk management;
 - stress-testing, which should adequately address business cycle risk and measure the banking institution’s ability to withstand adverse conditions (see subsection 3.5 for more details);
 - dividend payout;
 - provisioning and methodology; and
 - income recognition and methodology;
 - c. establish capital management guidelines and operating procedures to ensure that the banking institution is operating in compliance with regulatory capital standards and requirements as well as all internal policies in relation to capital adequacy; and
 - d. establish adequate control procedures to monitor the performance of staff in administering and controlling the capital position of the banking institution.
- 4.11.9 Failure to adhere to the above requirements may call into question whether the Board and senior management have adequately discharged their responsibility.

Key elements of CAAP

- 4.11.10 Banking institutions are expected to develop a CAAP that has the following characteristics:
- comprehensive in terms of the identification and measurement of the risks in a banking

institution's business and the assessment of how much capital is needed to support these risks;

- risk-based and forward-looking, with emphasis on the importance of capital planning, management and other qualitative aspects of risk management and controls, and taking into account the banking institution's strategic plans and how these relate to macroeconomic factors;
- integrated into the management process and decision-making culture of the banking institution. For more sophisticated banking institutions, the CAAP should be integrated into their day-to-day management process. For example, in addition to allocation of capital to business units, the CAAP would likely play a part in making credit decisions or other general business decisions (e.g. expansion plans and budgets). The results of the CAAP may also feed into the process of determining business strategies and risk appetites. Although smaller banking institutions tend to have less sophisticated capital planning and assessment systems, their CAAP should at least produce results that enable the ongoing assessment and management of their risk profile (e.g. the results may influence their lending behaviour or use of risk mitigants); and
- capable of producing a reasonable outcome on the overall level of capital and the assessment supporting such outcome.

4.11.11 The CAAP should capture all material risks of a banking institution, including the eight inherent risks covered under the Reserve Bank's risk-based supervisory framework. The overall environment within which the CAAP should operate is also important. banking institutions should, in particular, be able to identify other external risk factors that may arise from the regulatory, economic or business environment. In addition, adequate corporate governance and proper risk management / internal control arrangements constitute the foundation of an effective CAAP.

4.11.12 The basic elements of a sound CAAP should include:

- a. policies and procedures to identify, measure and report the risks inherent in a banking institution's activities;
- b. a process to relate the banking institution's internal capital to its risks;
- c. a process to state the banking institution's capital adequacy goals in relation to risk, taking into account its strategic focus and business plan; and
- d. a process of internal controls, review and audit to ensure the integrity of the overall management process.

Risk management policies and procedures

4.11.13 The policies and procedures to identify, measure and report the risks inherent in a banking institution's activities should meet the following standards:

- a. risk measurement systems should be sufficiently comprehensive and rigorous to capture the nature and magnitude of the risks faced by the banking institution, while differentiating risk exposures consistently among risk categories and levels of riskiness;
- b. adequate controls should be in place to ensure the objectivity and consistency of risk identification and measurement and that all material risks (both on-and off-balance sheet) are adequately addressed;
- c. detailed analyses should be conducted to support the accuracy or appropriateness of the risk measurement techniques used;
- d. inputs used in risk measurement should be of good quality;
- e. those risks that are not easily quantifiable should be evaluated using qualitative assessment and management judgement;
- f. changes in the banking institution's risk profile should be promptly incorporated into risk measures, whether the changes are due to new products or new businesses, increased volumes, changes in concentrations, the quality of the portfolio or the overall economic environment;
- g. when measuring risks, comprehensive and rigorous stress tests should be performed to identify possible events or market changes that could have serious adverse effects or significant impact on the banking institution's capital and operations; and
- h. adequate consideration should be given to contingent exposures arising from loan commitments, securitization and other transactions or activities that may create such exposures.

Internal capital allocation process

4.11.14 The process of relating a banking institution's internal capital to its risks should meet the following requirements:

- the amount of capital held should reflect not only the measured amount of risk but also an additional amount to account for potential uncertainties in risk measurement;
- the banking institution's capital should reflect the perceived level of precision in the risk measures used, the potential volatility of exposures and the relative importance of the activities producing the risk;
- capital levels should reflect the fact that historical correlation among exposures can change rapidly; and

- the banking institution should be able to demonstrate that its approach to relating capital to risk is conceptually sound and that outputs and results are reasonable.

Setting of capital adequacy goals

4.11.15 There should be a process to state the banking institution's capital adequacy goals in relation to risks, taking into account its strategic focus and business plan:

- a. explicit goals and targets need to be established for evaluating the banking institution's capital adequacy with respect to its risks;
- b. the banking institution should develop an internal strategy for maintaining capital levels which should not only reflect the desired level of risk coverage but also incorporate factors such as loan growth expectations, future sources and uses of funds, and dividend policy. Other considerations may also be taken into account (e.g. external rating goals, market image, strategic goals etc.) that are essential for the banking institution when deciding how much capital to hold. If these other considerations are included in the CAAP, the banking institution will be required to show how the considerations have influenced its decisions concerning the amount of capital to hold;
- c. the banking institution should have an explicit, approved capital plan that should state its objectives and time horizon for achieving them, and set out in broad terms the capital planning process and the responsibilities for that process. The capital plan should also set out how the banking institution will comply with capital requirements, any relevant limits related to capital, and a general contingency plan for dealing with divergences and unexpected events (e.g. raising additional capital, restricting business activities or using risk mitigation techniques for risk management purposes etc.);
- d. the banking institution should conduct stress tests that take into account the risks of the environment in which it is operating and the particular stage of the business cycle, to assess the impact of possible adverse events or scenarios on its capital. The banking institution should analyse what impact new legislation, competitors' actions etc. may have on its performance, in order to ascertain what changes in the environment it could sustain. The requirements and scenarios for stress-testing should be proportionate to the nature, size, risk profile and complexity of the banking institution's business activities;
- e. the banking institution should evaluate whether its long-run capital targets might differ from its short-run goals, based on current and planned changes in its risk profile and the recognition that accommodating

- f. new capital needs can require significant lead time;
- g. it is not necessary for the banking institution to use formal economic capital models for setting capital goals / targets and assessing its capital adequacy, although it is expected that more sophisticated banking institutions will elect to do so (in which case the additional criteria set out in subsection 4.4 have to be satisfied);
- h. the capital goals and targets should be reviewed and approved by the Board regularly (at least annually) to ensure their appropriateness; and
- i. appropriate adjustments to the CAAP should be timely initiated if changes in the business, strategy or operational environment suggest that the CAAP is no longer adequate.

Internal controls and audits

4.11.16 There should be a process of internal controls, review and audit to ensure the integrity of the overall CAAP:

- a. the banking institution should have a process of internal controls, independent review and audit to ensure the adequacy, effectiveness and reliability of the overall CAAP and to monitor the actual performance against the approved capital goals and targets as well as the conformity to the strategy and objectives stated in the CAAP. The frequency of the independent review and audit may vary depending on the size and complexity of individual banking institutions but should not be less than once every year;
- b. the CAAP and risk management process must be subject to periodic reviews to ensure their integrity, accuracy and reasonableness. Areas that should be reviewed include :
 - appropriateness of the CAAP given the nature, scope and complexity of the banking institution's business;
 - identification of large exposures and risk concentrations;
 - accuracy and completeness of data inputs into the banking institution's assessment process;
 - reasonableness and validity of scenarios used in the assessment process; and
 - stress-testing and analysis of assumptions and inputs;
- c. all deficiencies and weaknesses in the CAAP and non-compliance with approved internal policies and management guidelines on capital adequacy or minimum capital requirements must be timely reported to the Board and senior management for early rectification.

Design of CAAP

4.11.17 Banking institutions may design their CAAP in different ways to cater for their individual needs and circumstances. The following are some options that banking institutions may have reference to:

- a. using the statutory minimum as a starting point and adding considerations which are not captured or adequately captured by the statutory minimum. To many small and less complex banking institutions, a relatively simple CAAP is entirely acceptable for them. One possibility might be to base their CAAP primarily on the methodology set out in the minimum capital requirements, supplemented as necessary for any other generic factors which have a particular bearing on their risk profile (e.g. in terms of size, sector or products). For example, to obtain a capital goal, a banking institution may simply take the statutory minimum and adjust it with a capital add-on which is calibrated from elements outside the consideration of the statutory minimum and from other forward-looking elements (including the effect of stressed conditions). The banking institution should be able to demonstrate that it has adequately analysed all material risks outside the statutory minimum and found that all such risks were covered by the capital add-on;
- b. using different methodologies for the different risk types (including all risks captured by the statutory minimum and the capital add-on) and then calculating a simple sum of the resulting capital “needs”;
- c. using a more sophisticated and complex system, e.g. “bottom-up” transaction-based approaches with integrated correlations; or
- d. using a combination of the above

Documentation of CAAP

4.11.18 The CAAP (including the methodologies, assumptions, procedures etc.) and all related policies and management guidelines as well as the responsibilities of the Board, senior management and all related staff must be formally documented, and periodically reviewed and approved by the Board (at least annually).

4.11.19 The CAAP and related policies, management guidelines and procedures must be communicated and implemented institution-wide and supported by sufficient authority and resources.

4.12 Additional criteria for use of risk-modelling techniques

4.12.1 Larger and more sophisticated banking institutions may prefer using risk-modelling techniques (e.g. economic capital or other models) to perform risk aggregation and to assess capital adequacy. Risk aggregation is the summation of many types of risk into a single risk measure. This measure

estimates the amount of capital a banking institution requires to protect itself against all risks with a certain degree of confidence. Nevertheless, this approach is not mandatory.

- 4.12.2 Banking institutions using risk-modelling techniques to assess capital adequacy should ensure that their CAAP must be a comprehensive process seeking to identify their capital needs on the basis of both quantifiable and non-quantifiable risks. banking institutions should not rely on quantitative methods alone to assess capital adequacy. Non-quantifiable risks, if material, should also be included using qualitative assessment and management judgement. For example, in modelling the potential consequences of individual risks, account needs to be taken not only of the immediate direct profit and loss impact of possible loss events, but also of their potential consequential cost in terms of damage to banking institutions' reputation and future earning capacity.
- 4.12.3 Under no circumstances should the CAAP be a process which focuses only narrowly on the calculation and use of allocated capital or economic value added for individual products or business lines for internal profitability analysis. This approach can be important to a banking institution in targeting activities for future growth or cutbacks. However, the banking institution is required to first determine (by some methods) the amount of capital necessary for each activity or business line as a tool for evaluating the overall capital adequacy of the banking institution. Thus, the process for determining the necessary capital should not be confused with the related management efforts to measure relative returns of the banking institution or of individual business lines, given an amount of capital already invested or allocated.
- 4.12.4 Banking institutions must have adequate controls and procedures in place to validate, on a regular basis, the methodology and data and the robustness of the systems and processes involved in modelling the probabilities and potential consequences of individual risks and their aggregation. banking institutions should also be able to demonstrate that their internal validation process is adequate to enable them to assess the performance of the risk-modelling techniques consistently and meaningfully.
- 4.12.5 The Reserve Bank will assess whether the overall assessment and validation processes are commensurate with the nature, size and complexity of the banking institution's business and whether the outcomes generated from the processes are reasonable. The Reserve Bank will also assess the extent to which the risk-modelling techniques and the risk-adjusted performance measurement they support, are actually employed in managing the banking institution's business. banking institutions should understand that it would be difficult to assign much credibility to a model in which the banking institution concerned lacked either the confidence or the perceived need to use it to drive its business decisions.

4.13 Requirements for consolidated capital

- 4.13.1 Banking institutions conducting their CAAP at the group level should ensure that their consolidated capital is adequate to :
- a. support the volume and risk characteristics of all parent and subsidiary activities; and
 - b. provide a sufficient cushion to absorb potential losses arising from such activities.
- 4.13.2 Banking institutions should also be able to demonstrate to the satisfaction of the Reserve Bank that:
- a. their CAAP has been conducted on a consolidated basis and the total capital estimated as appropriate for the group has been allocated to each group member, according to their risk profile;
 - b. all group members, including the banking institution itself, have fully evaluated the risks they face (including reputation risk arising from the failure of another group member, and the risks they face due to exposure to or dependence upon other group members);
 - c. capital is freely transferable within the group (even in situations where the group is under financial stress, especially in relation to the group's cross-border operations where jurisdiction issues come into play); and
 - d. in case there is capital that is not, and the likelihood that it will not be, freely transferable between legal entities within the group, the CAAP has been adjusted to exclude such capital from the capital adequacy assessment.
- 4.13.3 In assessing the consolidated capital adequacy, the Reserve Bank will apply the same standards and requirements as required for assessing the capital adequacy of a banking institution on a solo basis.

4.14 Application to subsidiary banking institutions

- 4.14.1 All subsidiary banking institutions are required to ensure that they are adequately capitalised on a stand-alone basis and have their own CAAP which is commensurate with and proportionate to the nature, size and complexity of their business in Zimbabwe for supervisory review purposes. The Reserve Bank will continue to exercise his legal duty under the Banking Act (Chapter 24:20) to monitor their capital adequacy and their compliance with the minimum capital requirements through the SRP.

- 4.14.2 Where appropriate, subsidiary banking institutions of a foreign banking group may adopt the CAAP methodology used by their parent bank at the group level or, if their capital is centrally managed at the group level, rely on the group CAAP for assessing their capital adequacy. This is on the basis that the group CAAP is conducted in accordance with supervisory standards and criteria that are comparable with those required by the Reserve Bank, and that the CAAP outcome for the subsidiary banking institutions has taken into account their local business strategies and associated risks.
- 4.14.3 In addition, those foreign-owned subsidiary banking institutions that apply the group CAAP for assessing their capital adequacy should be able to explain and demonstrate to the satisfaction of the Reserve Bank how the capital assessment or allocation is made and how the assessment process meets the relevant supervisory standards and criteria. They should also have the primary responsibility of providing the Reserve Bank with any information, documentation and evidence that he may require for conducting the SRP. For example, the Reserve Bank may require a subsidiary banking institution to provide an independent review or audit report in relation to the adequacy and integrity of the overall assessment process and/or the validity of the models used for the assessment.
- 4.14.4 If a foreign-owned subsidiary banking institution is unable to satisfy the above-mentioned criteria, the banking institution will be required to establish and maintain its own CAAP in Zimbabwe to meet the Reserve Bank's supervisory standards.
- 4.14.5 In reviewing the capital adequacy of foreign-owned subsidiary banking institutions, the Reserve Bank will also take into account the strength and availability of parental support and other relevant input from the home supervisor. For example, the Reserve Bank may request the home supervisor to provide information and comments in respect of the capital adequacy of the parent bank or the results of its evaluation of the group CAAP systems.
- 4.14.6 The Board and senior management of subsidiary banking institutions should note that their responsibility remain unchanged in any circumstances.

4.15 Review by the Reserve Bank

- 4.15.1 In reviewing and evaluating a banking institution's CAAP, the Reserve Bank will have regard to the supervisory standards set out in this section. Key factors to be considered include:
- a. the soundness of the overall CAAP given the nature and scale of the banking institution's business activities;
 - b. the degree of management involvement in the process, for example, whether the target and

- actual capital levels are properly monitored and reviewed by the Board (or a designated committee) and senior management;
- c. the extent to which the internal capital assessment is used routinely within the banking institution for decision-making purposes;
 - d. the extent to which the banking institution has provided for unexpected events in setting capital levels;
 - e. the reasonableness of the outcome of the CAAP in terms of whether:
 - the amount of capital required as demonstrated by the CAAP is sufficient to support the risks faced by the banking institution; and
 - whether the levels and composition of capital chosen by the banking institution are comprehensive, relevant to the current operating environment, and appropriate for the nature and scale of the banking institution's business activities.

4.15.2 Banking institutions should be able to explain and demonstrate to the satisfaction of the Reserve Bank :

- how their CAAP meets supervisory requirements;
- how their material risks are defined, categorised and measured (if their own terminology is adopted), and how their approach relates to their obligations under the minimum capital requirements; and
- how the internal capital targets are chosen and how these targets are consistent with their overall risk profile, current operating environment as well as current and planned business needs.

4.15.3 Banking institutions are also expected to explain the similarities and differences between the level of capital calculated under their CAAP and their regulatory capital requirements.

4.15.4 The Reserve Bank expects that banking institutions with complex operations should have a more structured and well-defined risk management framework to monitor the effectiveness of internal control processes and risk exposures. However, for banking institutions with simple organisational structures and less complex operations and activities, the Reserve Bank considers that a less sophisticated institution-wide risk management framework is entirely appropriate.

4.15.5 In assessing whether banking institutions have sufficient capital to enable them to stay in business, the Reserve Bank will not rely solely on capital ratios as indicators of capital strength.

The Reserve Bank will consider, among other things, the capacity of a banking institution's capital structure to absorb losses and how this structure could be adversely affected by changes in performance⁴⁶. The Reserve Bank recognizes that core capital is an important component of a banking institution's capital structure because it allows banking institutions to absorb losses on an ongoing basis and is permanently available for this purpose. It also allows banking institutions to conserve resources when they are under stress as it provides full discretion as to the amount and timing of dividends and other distributions.

- 4.15.6 Therefore, banking institutions should determine the optimal level of core and supplementary capital to be maintained to meet their capital goals.
- 4.15.7 If a banking institution's CAAP does not meaningfully link the identification, evaluation and monitoring of the risks that arise from its business activities to the determination of its capital needs, the Reserve Bank will require the banking institution to improve the CAAP for better integration with internal risk measurement and analysis. The Reserve Bank will monitor the progress made by the banking institution in implementing the corrective actions.
- 4.15.8 Where the amount of capital which the Reserve Bank considers that the banking institution should hold is not the same as that generated from its CAAP (particularly where the amount of capital generated is lower than that expected by the Reserve Bank), the Reserve Bank will discuss the difference with the banking institution. The Reserve Bank will take into consideration the results of the CAAP and any explanations from the banking institution in relation to the outcome and appropriateness of the CAAP when determining its minimum CAR.
- 4.15.9 To facilitate his review, the Reserve Bank will ask for information such as the results of a banking institution's CAAP, together with an explanation of the process used. The Reserve Bank will require the banking institution to provide information not only on the amount of capital it considers appropriate, but also on the composition of that capital. In the case of a group CAAP, there should be a breakdown of group capital so as to facilitate evaluation of the extent to which diversification benefits have been incorporated into the underlying assumptions.
- 4.15.10 The Reserve Bank may seek other additional information from the banking institution where necessary.

⁴⁶ For example, a banking institution experiencing a net operating loss (perhaps due to realization of unexpected losses) will not only face a reduction in its retained earnings but also possible constraints on its access to capital markets. These constraints could be exacerbated if detrimental conversion options are exercised. Banking institutions should also note that a decrease in core capital may have further unfavorable implications for the regulatory capital position. Due to the statutory limits, the eligible amount of supplementary capital may be reduced. These adverse magnification effects could be further accentuated if adverse events take place at critical junctures for raising or maintaining capital (e.g. as term capital instruments are approaching maturity or new capital instruments are being issued).

- 4.15.11 A bank must be able to demonstrate to the Reserve Bank that its 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.
- 4.15.12 The five main features of the bank's capital management process are:
- a. board and senior management oversight;
 - b. sound capital assessment;
 - c. comprehensive assessment of risks;
 - d. monitoring and reporting; and
 - e. internal control review.

Board and senior management oversight...

- 4.15.13 A sound risk management process is the foundation for an effective assessment of the adequacy of a bank's capital position. A bank's senior 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 are appropriate in light of the risk profile and business plan.
- 4.15.14 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.
- 4.15.15 The bank's board of directors has the responsibility for setting the bank's tolerance for risks. 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 organisation.

Sound capital assessment...

- 4.15.16 Banking institutions should put in place sound capital assessment processes that include:
- a. policies and procedures designed to ensure that the bank identifies, measures, and reports all material risks;
 - b. a process that relates capital to the level of risk;
 - c. a process that states capital adequacy goals with respect to risk, taking account of the bank's strategic focus and business plan; and
 - d. a process of internal controls, reviews and audit to ensure the integrity of the overall management process.

Comprehensive assessment of risks...

- 4.15.17 All material risks faced by the bank should be addressed in the capital assessment process. Though the Reserve Bank recognises that not all risks can be measured precisely banks should ensure that process for estimating risks are developed and implemented. The following risk types, which by no means constitute a comprehensive list of all risks, should be considered.

Credit risk...

- 4.15.18 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. For more sophisticated banks, the credit review assessment of capital adequacy, at a minimum, should cover four areas: risk rating systems, portfolio analysis/aggregation, securitisation/complex credit derivatives, and large exposures and risk concentrations.
- 4.15.19 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 an institution's overall analysis of credit risk and capital adequacy. The ratings system should provide detailed ratings for all assets, not only for criticised or problem assets. Loan loss reserves should be included in the credit risk assessment for capital adequacy.
- 4.15.20 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 securitisation programmes and complex credit derivatives. Further, the analysis of counterparty credit risk should include consideration of public evaluation of the supervisor's compliance with the Core Principles for Effective banking Supervision.

Operational risk...

- 4.15.21 The Reserve Bank believes that similar rigour should be applied to the management of operational risk, as is done for the management of other significant banking risks. 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.
- 4.15.22 Every banking institution must develop frameworks for managing operational risk and evaluating 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...

- 4.15.23 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 firm-wide level. For more sophisticated banks, their assessment of internal capital adequacy for market risk, at a minimum, should be based on both Value at Risk (VaR) modeling and stress testing, including an assessment of concentration risk and the assessment of illiquidity under stressful market scenarios, although all firms' assessments should include stress testing appropriate to their trading activity.
- 4.15.24 VaR is an important tool in monitoring aggregate market risk exposures and provides a common metric for comparing the risk assumed by different trading desks and business lines. A bank's VaR model should be adequate to identify and measure risks arising from all its trading activities and should be integrated into the bank's overall internal capital assessment as well as subject to rigorous on-going validation. VaR model estimates should be sensitive to changes in the trading book risk profile.
- 4.15.25 Banks must supplement their VaR model with stress tests (factor shocks or integrated scenarios whether historic or hypothetical) and other appropriate risk management techniques such as conditional value at risk (CVaR) or expected shortfall.
- 4.15.26 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. In particular, it must factor in, where appropriate:

- a) illiquidity/gapping of prices;
- b) concentrated positions (in relation to market turnover);
- c) one-way markets;
- d) non-linear products/deep out-of-the money positions;
- e) events and jumps-to-defaults;
- f) significant shifts in correlations; and
- g) other risks that may not be captured appropriately in VaR (e.g. recovery rate uncertainty, implied correlations, or skew risk).

4.15.27 The stress tests applied by a bank and, in particular, the calibration of those tests (e.g. the parameters of the shocks or types of events considered) should be reconciled back to a clear statement setting out the premise upon which the bank's internal capital assessment is based (e.g. ensuring there is adequate capital to manage the traded portfolios within stated limits through what may be a prolonged period of market stress and illiquidity, or that there is adequate capital to ensure that, over a given time horizon to a specified confidence level, all positions can be liquidated or the risk hedged in an orderly fashion). The market shocks applied in the tests must reflect the nature of portfolios and the time it could take to hedge out or manage risks under severe market conditions.

4.15.28 Concentration risk should be pro-actively managed and assessed by firms and concentrated positions should be routinely reported to senior management.

4.15.29 Banks should design their risk management systems, including the VaR methodology and stress tests, to properly measure the material risks in instruments they trade as well as the trading strategies they pursue. As their instruments and trading strategies change, the VaR methodologies and stress tests should also evolve to accommodate the changes.

4.15.30 Banks must demonstrate how they combine their risk measurement approaches to arrive at the overall internal capital for market risk.

Interest rate risk in the banking book...

4.15.31 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.

- 4.15.32 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...

- 4.15.33 Liquidity is crucial to the ongoing viability of any banking organisation. Banks' capital positions can have an effect on their 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...

- 4.15.34 Although the Reserve Bank recognises that 'other' risks, such as reputational and strategic risk, are not easily measurable, it expects industry to incorporate new techniques, as they become available for various research sources, for managing all aspects of these risks.

Monitoring and reporting...

- 4.15.35 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:

- a. evaluate the level and trend of material risks and their effect on capital levels;
- b. evaluate the sensitivity and reasonableness of key assumptions used in the capital assessment measurement system;
- c. determine that the bank holds sufficient capital against the various risks and is in compliance with established capital adequacy goals; and
- d. assess its future capital requirements based on the bank's reported risk profile and make necessary adjustments to the bank's strategic plan accordingly.

Internal control review...

- 4.15.36 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.
- 4.15.37 All banking institutions should conduct periodic reviews of their risk management process to ensure their integrity, accuracy, and reasonableness. Areas that should be reviewed include:
- a. appropriateness of the bank's capital assessment process given the nature, scope and complexity of its activities;
 - b. identification of large exposures and risk concentrations;
 - c. accuracy and completeness of data inputs into the bank's assessment process;
 - d. reasonableness and validity of scenarios used in the assessment process; and
 - e. stress testing and analysis of assumptions and inputs.

5. DISCLOSURE REQUIREMENTS

- 5.1.1 The guidelines on minimum disclosure requirements are covered in “**Guideline No. 1-2008/BSD: Minimum Disclosure Requirements**”.

ANNEXURES

Annex 1: Supervisory Slotting Criteria for Specialised Lending

Table – Supervisory Rating Grades for Project Finance Exposures

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

	Strong	Good	Satisfactory	Weak
Force majeure risk (war, civil unrest, etc),	Low exposure	Acceptable exposure	Standard protection	Significant risks, not fully mitigated
Government support and project's importance for the country over the long term	Project of strategic importance for the country (preferably export-oriented). Strong support from Government	Project considered important for the country. Good level of support from Government	Project may not be strategic but brings unquestionable benefits for the country. Support from Government may not be explicit	Project not key to the country. No or weak support from Government
Stability of legal and regulatory environment (risk of change in law)	Favourable and stable regulatory environment over the long term	Favourable and stable regulatory environment over the medium term	Regulatory changes can be predicted with a fair level of certainty	Current or future regulatory issues may affect the project
Acquisition of all necessary supports and approvals for such relief from local content laws	Strong	Satisfactory	Fair	Weak
Enforceability of contracts, collateral and security	Contracts, collateral and security are enforceable	Contracts, collateral and security are enforceable	Contracts, collateral and security are considered enforceable even if certain non-key issues may exist	There are unresolved key issues in respect if actual enforcement of contracts, collateral and security
Transaction characteristics				
<i>Design and technology risk</i>	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
<i>Construction risk</i>				
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
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

	Strong	Good	Satisfactory	Weak
Completion guarantees	Substantial liquidated Damages supported by financial substance and/or strong completion guarantee from sponsors with excellent financial standing	Significant liquidated damages supported by financial substance and/or completion guarantee from sponsors with good financial standing	Adequate liquidated Damages supported by financial substance and/or completion guarantee from sponsors with good financial standing	Inadequate liquidated damages or not supported by financial substance or weak completion guarantees
Track record and financial strength of contractor in constructing similar projects.	Strong	Good	Satisfactory	Weak
<i>Operating risk</i> Scope and nature of operations and maintenance (O & M) contracts	Strong long-term O&M contract, preferably with contractual performance incentives, and/or O&M reserve accounts	Long-term O&M contract, and/or O&M reserve accounts	Limited O&M contract or O&M reserve account	No O&M contract: risk of high operational cost overruns beyond mitigants
Operator's expertise, track record, and financial strength	Very strong, or committed technical assistance of the sponsors	Strong	Acceptable	Limited/weak, or local operator dependent on local authorities
<i>Off-take risk</i> (a) If there is a take-or-pay or fixed-price off-take contract:	Excellent creditworthiness of off taker; strong termination clauses; tenor of contract comfortably exceeds the maturity of the debt	Good creditworthiness of off-taker; strong termination clauses; tenor of contract exceeds the maturity of the debt	Acceptable financial standing of off-taker; normal termination clauses; tenor of contract generally matches the maturity of the debt	Weak off-taker; weak termination clauses; tenor of contract does not exceed the maturity of the debt
(b) If there is no take-or-pay or fixed-price off-take contract:	Project produces essential services or a commodity sold widely on a world market; output can readily be absorbed at projected prices even at lower than historic market growth rates	Project produces essential services or a commodity sold widely on a regional market that will absorb it at projected prices at historical growth rates	Commodity is sold on a limited market that may absorb it only at lower than projected prices	Project output is demanded by only one or a few buyers or is not generally sold on an organised market

	Strong	Good	Satisfactory	Weak
<i>Supply risk</i> Price, volume and transportation risk of feed-stocks; supplier's track record and financial strength	Long-term supply contract with supplier of excellent financial Standing	Long-term supply contract with supplier of good financial standing	Long-term supply contract with supplier of good financial standing — a degree of price risk may remain	Short-term supply contract or long-term supply contract with financially weak supplier — a degree of price risk definitely remains
Reserve risks (e.g. natural resource development)	Independently audited, proven and developed reserves well in excess of requirements over lifetime of the project	Independently audited, proven and developed reserves in excess of requirements over lifetime of the project	Proven reserves can supply the project adequately through the maturity of the debt	Project relies to some extent on potential and undeveloped reserves
Strength of Sponsor				
Sponsor's track record, financial strength, and country/sector experience	Strong sponsor with excellent track record and high financial standing	Good sponsor with satisfactory track record and good financial standing	Adequate sponsor with adequate track record and good financial standing	Weak sponsor with no or questionable track record and/or financial weaknesses
Sponsor support, as evidenced by equity, ownership clause and incentive to inject additional cash if Necessary	Strong. Project is highly strategic for the sponsor (core business long-term strategy)	Good. Project is strategic for the sponsor (core business — long-term strategy)	Acceptable. Project is considered important for the sponsor (core business)	Limited. Project is not key to sponsor's long-term strategy or core business
Security Package				
Assignment of contracts and accounts	Fully comprehensive	Comprehensive	Acceptable	Weak
Pledge of assets, taking into account quality, value and liquidity of assets	First perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Perfected security interest in all project assets, contracts, permits and accounts necessary to run the project	Acceptable security interest in all project assets, contracts, permits and accounts necessary to run the project	Little security or collateral for lenders; weak negative pledge clause
Lender's control over cash flow (e.g. cash sweeps, independent escrow accounts)	Strong Covenant package is strong for this type of project	Satisfactory Covenant package is satisfactory for this type of project	Fair Covenant package is fair for this type of project	Weak Covenant package is Insufficient for this type of project

	Strong	Good	Satisfactory	Weak
Strength of the covenant package (mandatory prepayments, payment deferrals, payment cascade, dividend restrictions...)	Project may issue no additional debt	Project may issue extremely limited additional debt	Project may issue limited additional debt	Project may issue unlimited additional debt
Reserve funds (debt service, O&M, renewal and replacement, unforeseen events, etc)	Longer than average coverage period, all reserve funds fully funded in cash or letters of credit from highly rated bank	Average coverage period, all reserve funds fully funded	Average coverage period, all reserve funds fully funded	Shorter than average coverage period, reserve funds funded from operating cash flows

Table 16:2 Supervisory Rating Grades for IPRE and HVCRE Exposures

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

	stress (e.g. interest rates, economic growth)	growth). The property is likely to default only under severe economic conditions	to fund capital expenditures and significantly increase the risk of default	improve in the near term
	Strong	Good	Satisfactory	Weak
Cash-flow predictability				
(a) For complete and stabilised property.	The property's leases are long-term with creditworthy tenants and their maturity dates are scattered. The property has a track record of tenant retention upon lease expiration. Its vacancy rate is low. Expenses (maintenance, insurance, security, and property taxes) are predictable	Most of the property's leases are long-term, with tenants that range in creditworthiness. The property experiences a normal level of tenant turnover upon lease expiration. Its vacancy rate is low. Expenses are predictable	Most of the property's leases are medium rather than long-term with tenants that range in creditworthiness. The property experiences a moderate level of tenant turnover upon lease expiration. Its vacancy rate is moderate. Expenses are relatively predictable but vary in relation to revenue	The property's leases are of various terms with tenants that range in creditworthiness. The property experiences a very high level of tenant turnover upon lease expiration. Its vacancy rate is high. Significant expenses are incurred preparing space for new tenants
(b) For complete but not stabilised property	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Leasing activity meets or exceeds projections. The project should achieve stabilisation in the near future	Most leasing activity is within projections; however, stabilisation will not occur for some time	Market rents do not meet expectations. Despite achieving target occupancy rate, cash flow coverage is tight due to disappointing revenue.
(c) For construction phase	The property is entirely preleased 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 preleased or pre-sold to a creditworthy tenant or buyer, or the bank has a binding commitment for permanent financing from a creditworthy lender	Leasing activity is within projections but the building may not be pre-leased and there may not exist a takeout financing. The bank may be the permanent lender	The property is deteriorating due to cost overruns, market deterioration, tenant cancellations or other factors. There may be a dispute with the party providing the permanent financing
Asset characteristics	Strong	Good	Satisfactory	Weak
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
	Strong	Good	Satisfactory	Weak
Design and condition Property is under construction	Property is favoured due to its design, configuration, and maintenance, and is highly competitive with new properties Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Property is appropriate in terms of its design, configuration and maintenance. The property's design and capabilities are competitive with new properties Construction budget is conservative and technical hazards are limited. Contractors are highly qualified	Property is adequate in terms of its configuration, design and maintenance Construction budget is adequate and contractors are ordinarily qualified	Weaknesses exist in the property's configuration, design or maintenance Project is over budget or unrealistic given its technical hazards. Contractors may be under qualified
Strength of Sponsor/Developer				
Financial capacity and willingness to support the property. Reputation and track record with similar properties.	The sponsor/developer made a substantial cash contribution to the construction or purchase of the property. The sponsor/developer has substantial resources and limited direct and contingent liabilities. The sponsor/developer's properties are diversified geographically and by property type Experienced management and high sponsors' quality. Strong reputation and lengthy and successful record with similar properties	The sponsor/developer made a material cash contribution to the construction or purchase of the property. The sponsor/developer's financial condition allows it to support the property in the event of a cash flow shortfall. The sponsor/developer's properties are located in several geographic regions Appropriate management and sponsors' quality. The sponsor or management has a successful record with similar properties	The sponsor/developer's contribution may be immaterial or non-cash. The sponsor/developer is average to below average in financial resources Moderate management and sponsors' quality. Management or sponsor track record does not raise serious concerns	The sponsor/developer lacks capacity or willingness to support the property Ineffective management and substandard sponsors' quality. Management and sponsor difficulties have contributed to difficulties in managing properties in the past
Relationships with relevant real estate actors	Strong relationships with leading actors such as leasing agents	Proven relationships with leading actors such as leasing agents	Adequate relationships with leasing agents and other parties providing important real estate services	Poor relationships with leasing agents and/or other parties providing important real estate services
Security Package				
Nature of lien	Perfected first lien l	Perfected first lien l	Perfected first lien l	Ability of lender to foreclose is

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	constrained The lender has not obtained an assignment of the leases or has not maintained the information necessary to readily provide notice to the building's tenants
Quality of the insurance Coverage	Appropriate	Appropriate	Appropriate	Substandard

Table 16.3 – Supervisory Rating Grades for Object Finance Exposures

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

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

Sponsors' track record and financial strength	Sponsors with excellent track record and high financial standing	Sponsors with good track record and good financial standing	Sponsors with adequate track record and good financial standing	Sponsors with no or questionable track record and/or financial weaknesses
Security Package				
Asset control	Legal documentation provides the lender effective control (e.g. a first perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	Legal documentation provides the lender effective control (e.g. a perfected security interest, or a leasing structure including such security) on the asset, or on the company owning it	The contract provides little security to the lender and leaves room to some risk of losing control on the asset
Rights and means at the lender's disposal to monitor the location and condition of the asset	The lender is able to monitor the location and condition of the asset, at any time and place (regular reports, possibility to lead inspections)	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset, almost at any time and place	The lender is able to monitor the location and condition of the asset are limited
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 16.4 – Supervisory Rating Grades for Commodities Finance Exposures

	Strong	Good	Satisfactory	Weak
Financial strength				
Degree of over-collateralisation of trade	Strong	Good	Satisfactory	Weak
Political and legal Environment				
Country risk	No country risk	Limited exposure to country risk (in particular, offshore location of reserves in an emerging country)	Exposure to country risk (in particular, offshore location of reserves in an emerging country)	Strong exposure to country risk (in particular, inland reserves in an emerging country)
Mitigation of country risks	Very strong mitigation: Strong offshore Mechanisms Strategic commodity 1st class buyer	Strong mitigation: Offshore mechanisms Strategic commodity Strong buyer	Acceptable mitigation: Offshore mechanisms Less strategic commodity Acceptable buyer	Only partial mitigation: No offshore mechanisms Non-strategic commodity Weak buyer
Asset characteristics				
Liquidity and susceptibility to damage	Commodity is quoted and can be hedged through futures or OTC instruments. Commodity is not susceptible to damage	Commodity is quoted and can be hedged through OTC instruments. Commodity is not susceptible to damage	Commodity is not quoted but is liquid. There is uncertainty about the possibility of hedging. Commodity is not susceptible to damage	Commodity is not quoted. Liquidity is limited given the size and depth of the market. No appropriate hedging instruments. Commodity is susceptible to damage
Strength of sponsor				
Financial strength of trader	Very strong, relative to trading philosophy and risks	Strong	Adequate	Weak
Track record, including ability to manage the logistic process	Extensive experience with the type of transaction in question. Strong record of operating success and cost efficiency	Sufficient experience with the type of transaction in question. Above average record of operating success and cost efficiency	Limited experience with the type of transaction in question. Average record of operating success and cost efficiency	Limited or uncertain track record in general. Volatile costs and profits
Trading controls and hedging policies	Strong standards for Counterparty selection, hedging, and monitoring	Adequate standards for counterparty selection, hedging, and monitoring	Past deals have experienced no or minor problems	Trader has experienced significant losses on past deals
Quality of financial Disclosure	Excellent	Good	Satisfactory	Financial disclosure contains some uncertainties or is insufficient
Security package				

Asset control	First perfected security interest provides the lender legal control of the assets at any time if needed	First perfected security interest provides the lender legal control of the assets at any time if needed	At some point in the process, there is a rupture in the control of the assets by the lender. The rupture is mitigated by knowledge of the trade process or a third party undertaking as the case may be.	Contract leaves room for some risk of losing control over the assets. Recovery could be jeopardised
Insurance against Damages	Strong insurance coverage including collateral damages with top quality insurance companies	Satisfactory insurance coverage (not including collateral damages) with good quality insurance companies	Fair insurance coverage (not including collateral damages) with acceptable quality insurance companies	Weak insurance coverage (not including collateral damages) or with weak quality insurance companies

Annex 2: Capital treatment for failed trades and non-DvP transactions

A. Introduction

1. A banking institution should continuously improve its systems for tracking and monitoring the credit risk exposures arising from unsettled and failed transactions, as appropriate, for producing management information that facilitates action on a timely basis.
2. Transactions settled through a delivery-versus-payment system (DvP), providing simultaneous exchanges of securities for cash, expose firms to a risk of loss on the difference between the transaction valued at the agreed settlement price and the transaction valued at current market price (i.e. positive current exposure). Transactions where cash is paid without receipt of the corresponding receivable (securities, foreign currencies, gold, or commodities) or, conversely, deliverables were delivered without receipt of the corresponding cash payment (non-DvP, or free-delivery) expose firms to a risk of loss on the full amount of cash paid or deliverables delivered.
3. The following capital treatment is applicable to all transactions on securities, foreign exchange instruments, and commodities that give rise to a risk of delayed settlement or delivery. This includes transactions through recognised clearing houses that are subject to daily mark-to-market and payment of daily variation margins and that involve a mismatched trade. Repurchase and reverse-repurchase agreements as well as securities lending and borrowing that have failed to settle are excluded from this capital treatment.
4. In cases of a system wide failure of a settlement or clearing system, a national supervisor may use its discretion to waive capital charges until the situation is rectified.
5. Failure of a counterparty to settle a trade in itself will not be deemed a default for purposes of credit risk under this guideline.
6. In applying a risk weight to failed free-delivery exposures, banks using the IRB approach for credit risk may assign PDs to counterparties for which they have no other banking book

exposure on the basis of the counterparty’s external rating. Banks using the Advanced IRB approach may use a 45% LGD in lieu of estimating LGDs so long as they apply it to all failed trade exposures. Alternatively, banks using the IRB approach may opt to apply the standardised approach risk weights or a 100% risk weight

B. Capital requirements

1. For DvP transactions, if the payments have not yet taken place five business days after the settlement date, firms must calculate a capital charge by multiplying the positive current exposure of the transaction by the appropriate factor, according to the following table:

Table 21 DvP transactions capital factors

Number of working days after the agreed settlement date	Corresponding risk multiplier
From 5 to 15	8%
From 16 to 30	50%
From 31 to 45	75%
46 or more	100%

2. A reasonable transition period may be allowed for firms to upgrade their information system to be able to track the number of days after the agreed settlement date and calculate the corresponding capital charge.
3. For non-DvP transactions (i.e. free deliveries), after the first contractual payment/delivery leg, the bank that has made the payment will treat its exposure as a loan if the second leg has not been received by the end of the business day. This means that a bank under the IRB approach will apply the appropriate IRB formula set out in this guideline, for the exposure to the counterparty, in the same way as it does for all other banking book exposures. Similarly, banks under the standardised approach will use the standardised risk weights set forth in this guideline. However, when exposures are not material, banks may choose to apply a uniform 100% risk-weight to these exposures, in order to avoid the burden of a full credit assessment. If five business days after the second contractual payment/delivery date the second leg has not yet effectively taken place, the bank that has made the first payment leg will deduct from capital the full amount of the value transferred plus replacement cost, if any. This treatment will apply until the second payment/delivery leg is effectively made.

Annex 3: Treatment of counterparty credit risk and cross-product netting

A. Overview

1. This annexure covers permissible methods for estimating the Exposure at Default (EAD) or the exposure amount for instruments with counterparty credit risk (CCR) under the Basel II framework. Banks may seek Reserve Bank approval to make use of an internal modeling method meeting the requirements and specifications in this chapter. As alternatives banks may also use the standardized method or the current exposure method.

B. Definitions and general terminology

2. This section defines terms that will be used throughout this text.

General terms...

3. Counterparty **Credit Risk (CCR)** is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. An economic loss would occur if the transactions or portfolio of transactions with the counterparty has a positive economic value at the time of default. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, CCR creates a bilateral risk of loss: the market value of the transaction can be positive or negative to either counterparty to the transaction. The market value is uncertain and can vary over time with the movement of underlying market factors.

Transaction types...

4. **Long Settlement Transactions** are transactions where a counterparty undertakes to deliver a security, a commodity, or a foreign exchange amount against cash, other financial instruments, or commodities, or vice versa, at a settlement or delivery date that is

contractually specified as more than the lower of the market standard for this particular instrument and five business days after the date on which the bank enters into the transaction.

5. **Securities Financing Transactions (SFTs)** are transactions such as repurchase agreements, reverse repurchase agreements, security lending and borrowing, and margin lending transactions, where the value of the transactions depends on market valuations and the transactions are often subject to margin agreements.
6. **Margin Lending Transactions** are transactions in which a bank extends credit in connection with the purchase, sale, carrying or trading of securities. Margin lending transactions do not include other loans that happen to be secured by securities collateral. Generally, in margin lending transactions, the loan amount is collateralised by securities whose value is greater than the amount of the loan.

Netting sets, hedging sets, and related terms...

7. **Netting Set** is a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement and for which netting is recognised for regulatory capital purposes under the provisions of the 1988 Accord, as amended, this Framework text on credit risk mitigation techniques, or the Cross- Product Netting Rules set forth in this annexure. Each transaction that is not subject to a legally enforceable bilateral netting arrangement that is recognized for regulatory capital purposes should be interpreted as its own netting set for the purpose of these rules.
8. **Risk Position** is a risk number that is assigned to a transaction under the CCR standardised method (set out in this annexure) using a regulatory algorithm.
9. **Hedging Set** is a group of risk positions from the transactions within a single netting set for which only their balance is relevant for determining the exposure amount or EAD under the CCR standardised method.
10. **Margin Agreement** is a contractual agreement or provisions to an agreement under which one counterparty must supply collateral to a second counterparty when an exposure of that second counterparty to the first counterparty exceeds a specified level.
11. **Margin Threshold** is the largest amount of an exposure that remains outstanding until one party has the right to call for collateral.
12. **Margin Period of Risk** is the time period from the last exchange of collateral covering a netting set of transactions with a defaulting counterpart until that counterpart is closed out and the resulting market risk is re-hedged.
13. Effective **Maturity under the Internal Model Method** for a netting set with maturity greater than one year is the ratio of the sum of expected exposure over the life of the transactions in a netting set discounted at the risk-free rate of return divided by the sum of expected exposure over one year in a netting set discounted at the risk free rate. This effective maturity may be adjusted to reflect rollover risk by replacing expected exposure with effective expected exposure for forecasting horizons under one year. The formula is given in paragraph I.A.13.
14. **Cross-Product Netting** refers to the inclusion of transactions of different product categories within the same netting set pursuant to **the** Cross-Product Netting Rules set out in this annex.
15. **Current Market Value (CMV)** refers to the net market value of the portfolio of transactions within the netting set with the counterparty. Both positive and negative market values are used in computing CMV.

Distributions...

16. **Distribution of Market Values** is the forecast of the probability distribution of net market values of transactions within a netting set for some future date (the forecasting horizon) given the realised market value of those transactions up to the present time.
17. **Distribution of Exposures** is the forecast of the probability distribution of market values that is generated by setting forecast instances of negative net market values equal to zero (this takes account of the fact that, when the bank owes the counterparty money, the bank does not have an exposure to the counterparty).
18. **Risk-Neutral Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using market implied values such as implied volatilities.
19. **Actual Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using historic or realised values such as volatilities calculated using past price or rate changes.

Exposure measures and adjustments...

20. **Current Exposure** is the larger of zero, or the market value of a transaction or portfolio of transactions within a netting set with a counterparty that would be lost upon the default of the counterparty, assuming no recovery on the value of those transactions in bankruptcy. Current exposure is often also called Replacement Cost.
21. **Peak Exposure** is a high percentile (typically 95% or 99%) of the distribution of exposures at any particular future date before the maturity date of the longest transaction in the netting set. A peak exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.
22. **Expected Exposure** is the mean (average) of the distribution of exposures at any particular future date before the longest-maturity transaction in the netting set matures. An expected exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.
23. **Effective Expected Exposure** at a specific date is the maximum expected exposure that occurs at that date or any prior date. Alternatively, it may be defined for a specific date as the greater of the expected exposure at that date, or the effective exposure at the previous date. In effect, the Effective Expected Exposure is the Expected Exposure that is constrained to be non-decreasing over time.
24. **Expected Positive Exposure (EPE)** is the weighted average over time of expected

exposures where the weights are the proportion that an individual expected exposure represents of the entire time interval. When calculating the minimum capital requirement, the average is taken over the first year or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set.

25. **Effective Expected Positive Exposure (Effective EPE)** is the weighted average over time of effective expected exposure over the first year, or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set where the weights are the proportion that an individual expected exposure represents of the entire time interval.
26. **Credit Valuation Adjustment** is an adjustment to the mid-market valuation of the portfolio of trades with a counterparty. This adjustment reflects the market value of the credit risk due to any failure to perform on contractual agreements with a counterparty. This adjustment may reflect the market value of the credit risk of the counterparty or the market value of the credit risk of both the bank and the counterparty.
27. **One-Sided Credit Valuation Adjustment** is a credit valuation adjustment that reflects the market value of the credit risk of the counterparty to the firm, but does not reflect the market value of the credit risk of the bank to the counterparty.

CCR-related risks...

28. **Rollover Risk** is the amount by which expected positive exposure is understated when future transactions with a counterpart are expected to be conducted on an ongoing basis, but the additional exposure generated by those future transactions is not included in calculation of expected positive exposure.
29. **General Wrong-Way Risk** arises when the probability of default of counterparties is positively correlated with general market risk factors.
30. **Specific Wrong-Way Risk** arises when the exposure to a particular counterpart is positively correlated with the probability of default of the counterparty due to the nature of the transactions with the counterparty.

C. Scope of application

1. The methods for computing the exposure amount under the standardised approach for credit risk or EAD under the internal ratings-based (IRB) approach to credit risk described in this annex are applicable to SFTs and OTC derivatives.
2. Such instruments generally exhibit the following abstract characteristics:
 - a. the transactions generate a current exposure or market value;
 - b. the transactions have an associated random future market value based on market variables;
 - c. the transactions generate an exchange of payments or an exchange of a financial instrument (including commodities) against payment; and
 - d. the transactions are undertaken with an identified counterparty against which a unique probability of default can be determined.
3. Other common characteristics of the transactions to be covered may include the following:
 - a. collateral may be used to mitigate risk exposure and is inherent in the nature of some transactions;
 - b. short-term financing may be a primary objective in that the transactions mostly consist of an exchange of one asset for another (cash or securities) for a relatively short period of time, usually for the business purpose of financing. The two sides of the transactions are not the result of separate decisions but form an indivisible whole to accomplish a defined objective;
 - c. netting may be used to mitigate the risk;
 - d. positions are frequently valued (most commonly on a daily basis), according to market variables;
 - e. remargining may be employed.
4. An exposure value of zero for counterparty credit risk can be attributed to derivative contracts or SFTs that are outstanding with a central counterparty (e.g. a clearing house). This does not apply to counterparty credit risk exposures from derivative transactions and SFTs that have been rejected by the central counterparty.
5. Furthermore, an exposure value of zero can be attributed to banks' credit risk exposures to central counterparties that result from the derivative transactions, SFTs or spot transactions that the bank has outstanding with the central counterparty. This exemption extends in particular to credit exposures from clearing deposits and from collateral posted with the central counterparty.
6. A central counterparty is an entity that interposes itself between counterparties to contracts traded within one or more financial markets, becoming the legal counterparty such that it is

the buyer to every seller and the seller to every buyer. In order to qualify for the above exemptions, the central counterparty CCR exposures with all participants in its arrangements must be fully collateralized on a daily basis, thereby providing protection for the central counterparty's CCR exposures.

7. Assets held by a central counterparty as a custodian on the bank's behalf would not be subject to a capital requirement for counterparty credit risk exposure.
8. Under all of the three methods identified in this annex, when a bank purchases credit derivative protection against a banking book exposure, or against a counterparty credit risk exposure, it will determine its capital requirement for the hedged exposure subject to the criteria and general rules for the recognition of credit derivatives, i.e. substitution or double default rules as appropriate. Where these rules apply, the exposure amount or EAD for counterparty credit risk from such instruments is zero.
9. The exposure amount or EAD for counterparty credit risk is zero for sold credit default swaps in the banking book where they are treated in the framework as a guarantee provided by the bank and subject to a credit risk charge for the full notional amount.
10. Under all three methods identified in this annex, the exposure amount or EAD for a given counterparty is equal to the sum of the exposure amounts or EADs calculated for each netting set with that counterparty.

D. Cross-product netting rules

1. **Banks that receive approval to estimate their exposures to CCR using** the internal model method may include within a netting set SFTs, or both SFTs and OTC derivatives subject to a legally valid form of bilateral netting that satisfies the following legal and operational criteria for a Cross-Product Netting Arrangement (as defined below). The bank must also have satisfied any prior approval or other procedural requirements that its national supervisor determines to implement for purposes of recognising a Cross-Product Netting Arrangement.

Legal Criteria...

2. **The bank has executed a written, bilateral netting agreement with the counterparty that creates a single legal obligation, covering all included bilateral master agreements and transactions ("Cross-Product Netting Arrangement"), such that the bank would have either a claim to receive or obligation to pay only the net sum of the positive and negative (i) closeout values of any included individual master agreements and (ii) mark-to-market**

values of any included individual transactions (the “Cross-Product Net Amount”), in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances.

3. The bank has written and reasoned legal opinions that conclude with a high degree of certainty that, in the event of a legal challenge, relevant courts or administrative authorities would find the firm’s exposure under the Cross-Product Netting Arrangement to be the Cross-Product Net Amount under the laws of all relevant jurisdictions. In reaching this conclusion, legal opinions must address the validity and enforceability of the entire Cross-Product Netting Arrangement under its terms and the impact of the Cross-Product Netting Arrangement on the material provisions of any included bilateral master agreement:
 - a. the laws of “all relevant jurisdictions” are: (i) the law of the jurisdiction in which the counterparty is chartered and, if the foreign branch of a counterparty is involved, then also under the law of the jurisdiction in which the branch is located, (ii) the law that governs the individual transactions, and (iii) the law that governs any contract or agreement necessary to effect the netting; and
 - b. a legal opinion must be generally recognised as such by the legal community in the firm’s home country or a memorandum of law that addresses all relevant issues in a reasoned manner.
4. The bank has internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by legal opinions that meet the above criteria.
5. The bank undertakes to update legal opinions as necessary to ensure continuing enforceability of the Cross-Product Netting Arrangement in light of possible changes in relevant law.
6. The Cross-Product Netting Arrangement does not include a walk away clause. A walk away clause is a provision which permits a non-defaulting counterparty to make only limited payments, or no payment at all, to the estate of the defaulter, even if the defaulter is a net creditor.
7. Each included bilateral master agreement and transaction included in the Cross- Product Netting Arrangement satisfies applicable legal requirements for recognition of (i) bilateral netting of derivatives contracts in Annex 3 of the 1988 Accord, as amended in April 1995, or (ii) credit risk mitigation techniques in Chapter 3.16 of this guideline.
8. The bank maintains all required documentation in its files.

Operational Criteria...

9. The Reserve Bank is satisfied that the effects of a Cross-Product Netting Arrangement are factored into the firm's measurement of a counterparty's aggregate credit risk exposure and that the bank manages its counterparty credit risk on such basis.
10. Credit risk to each counterparty is aggregated to arrive at a single legal exposure across products covered by the Cross-Product Netting Arrangement. This aggregation must be factored into credit limit and economic capital processes.

E. Approval to adopt an internal modelling method to estimate EAD

1. A bank (meaning the individual legal entity or a group) that wishes to adopt an internal modelling method to measure exposure or EAD for regulatory capital purposes must seek approval from its supervisor. The internal modelling method is available both for banks that adopt the internal ratings-based approach to credit risk and for banks for which the standardised approach to credit risk applies to all of their credit risk exposures. The bank must meet all of the requirements given in F of this annex and must apply the method to all of its exposures that are subject to counterparty credit risk, except for long settlement transactions.
2. A bank may also choose to adopt an internal modelling method to measure CCR for regulatory capital purposes for its exposures or EAD to only OTC derivatives, to only SFTs, or to both, subject to the appropriate recognition of netting specified above. The bank must apply the method to all relevant exposures within that category, except for those that are immaterial in size and risk. During the initial implementation of the internal models method, a bank may use the standardised method or the current exposure method for a portion of its business. The bank must submit a plan to its supervisor to bring all material exposures for that category of transactions under the internal model method.
3. For all OTC derivative transactions and for all long settlement transactions for which a bank has not received approval from its supervisor to use the internal models method, the bank must use either the standardised method or the current exposure method. Combined use of the current exposure method and the standardised method is permitted on a permanent basis within a group. Combined use of the current exposure method and the standardised method within a legal entity is only permissible for the cases indicated in paragraph I.A.24.
4. Exposures or EAD arising from long settlement transactions can be determined using any of the three methods identified in this document regardless of the methods chosen for treating

OTC derivatives and SFTs. In computing capital requirements for long settlement transactions banks that hold permission to use the internal ratings-based approach may opt to apply the risk weights under this Framework's standardised approach for credit risk on a permanent basis and irrespective to the materiality of such positions.

5. After adoption of the internal model method, the bank must comply with the above requirements on a permanent basis. Only under exceptional circumstances or for immaterial exposures can a bank revert to either the current exposure or standardised methods for all or part of its exposure. The bank must demonstrate that reversion to a less sophisticated method does not lead to an arbitrage of the regulatory capital rules.

F. Internal Model Method(IMM): Measuring exposure and minimum requirements

Exposure amount or EAD under the IMM...

1. CCR exposure or EAD is measured at the level of the netting set as defined in paragraph B and C. A qualifying internal model for measuring counterparty credit exposure must specify the forecasting distribution for changes in the market value of the netting set attributable to changes in market variables, such as interest rates, foreign exchange rates, etc. The model then computes the firm's CCR exposure for the netting set at each future date given the changes in the market variables. For margined counterparties, the model may also capture future collateral movements. Banks may include eligible financial collateral as defined in paragraphs 3.16.34 of this guideline in their forecasting distributions for changes in the market value of the netting set, if the quantitative, qualitative and data requirements for internal model method are met for the collateral.
2. To the extent that a bank recognises collateral in exposure amount or EAD via current exposure, a bank would not be permitted to recognise the benefits in its estimates of LGD. As a result, the bank would be required to use an LGD of an otherwise similar uncollateralised facility. In other words, the bank would be required to use an LGD that does not include collateral that is already included in EAD.
3. Under the Internal Model Method, the bank need not employ a single model. Although the following text describes an internal model as a simulation model, no particular form of model is required. Analytical models are acceptable so long as they are subject to supervisory review, meet all of the requirements set forth in this section and are applied to all material exposures subject to a CCR-related capital charge as noted above, with the exception of long

settlement transactions, which are treated separately, and with the exception of those exposures that are immaterial in size and risk.

4. Expected exposure or peak exposure measures should be calculated based on a distribution of exposures that accounts for the possible non-normality of the distribution of exposures, including the existence of leptokurtosis (“fat tails”), where appropriate.
5. When using an internal model, exposure amount or EAD is calculated as the product of alpha times Effective EPE, as specified below:

$$EAD = \alpha \times \text{Effective EPE}$$

6. Effective EPE (“Expected Positive Exposure”) is computed by estimating expected exposure (EE_t) as the average exposure at future date t , where the average is taken across possible future values of relevant market risk factors, such as interest rates, foreign exchange rates, etc. The internal model estimates EE at a series of future dates $t_1, t_2, t_3 \dots$. Specifically, “Effective EE” is computed recursively as

$$\text{Effective } EE_{t_k} = \max(\text{Effective } EE_{t_{k-1}}, EE_{t_k})$$

where: the current date is denoted as t_0 and Effective EE_{t_0} equals current exposure.

7. In this regard, “Effective EPE” is the average Effective EE during the first year of future exposure. If all contracts in the netting set mature before one year, EPE is the average of expected exposure until all contracts in the netting set mature. Effective EPE is computed as a weighted average of Effective EE:

$$\text{Effective EPE} = \sum_{k=1}^{\min(1 \text{ year, maturity})} \text{Effective } EE_{t_k} \times \Delta t_k$$

where: the weights $\Delta t_k = t_k - t_{k-1}$ allows for the case when future exposure is calculated at dates that are not equally spaced over time. Alpha (α) is set equal to 1.4.

8. The Reserve Bank has the discretion to require a higher alpha based on a firm’s CCR exposures. Factors that may require a higher alpha include the low granularity of counterparties; particularly high exposures to general wrong-way risk; particularly high

correlation of market values across counterparties; and other institution-specific characteristics of CCR exposures.

Own estimates for alpha

9. Banks may seek approval from the Reserve Bank to compute internal estimates of alpha subject to a floor of 1.2, where alpha equals the ratio of economic capital from a full simulation of counterparty exposure across counterparties (numerator) and economic capital based on EPE (denominator), assuming they meet certain operating requirements. Eligible banks must meet all the operating requirements for internal estimates of EPE and must demonstrate that their internal estimates of alpha capture in the numerator the material sources of stochastic dependency of distributions of market values of transactions or of portfolios of transactions across counterparties (e.g. the correlation of defaults across counterparties and between market risk and default).
10. In the denominator, EPE must be used as if it were a fixed outstanding loan amount.
11. To this end, banks must ensure that the numerator and denominator of alpha are computed in a consistent fashion with respect to the modelling methodology, parameter specifications and portfolio composition. The approach used must be based on the firm’s internal economic capital approach, be well-documented and be subject to independent validation. In addition, banks must review their estimates on at least a quarterly basis, and more frequently when the composition of the portfolio varies over time. Banks must assess the model risk.
12. Where appropriate, volatilities and correlations of market risk factors used in the joint simulation of market and credit risk should be conditioned on the credit risk factor to reflect potential increases in volatility or correlation in an economic downturn. Internal estimates of alpha should take account of the granularity of exposures.

Maturity

13. If the original maturity of the longest-dated contract contained in the set is greater than one year, the formula for effective maturity (M) discussed above in this guideline is replaced with the following:

$$M = \frac{\sum_{k=1}^{t_k \leq 1 \text{ year}} \text{Effective } EE_k \times \Delta t_k \times df_k + \sum_{t_k > 1 \text{ year}}^{\text{maturity}} EE_k \times \Delta t_k \times df_k}{\sum_{k=1}^{t_k \leq 1 \text{ year}} \text{Effective } EE_k \times \Delta t_k \times df_k}$$

where df_k is the risk-free discount factor for future time period t_k and the remaining symbols are defined above. Similar to the treatment under corporate exposures, M has a cap of five years.

14. For netting sets in which all contracts have an original maturity of less than one year, the formula for effective maturity (M) remains unchanged and a floor of one year applies, with the exception of short-term exposures.

Margin agreements...

15. If the netting set is subject to a margin agreement and the internal model captures the effects of margining when estimating EE, the model's EE measure may be used directly in equation (2). Such models are noticeably more complicated than models of EPE for unmarginated counterparties. As such, they are subject to a higher degree of supervisory scrutiny before they are approved, as discussed below.
16. A bank that can model EPE without margin agreements but cannot achieve the higher level of modelling sophistication to model EPE with margin agreements can use the following method for margined counterparties. The method is a simple and conservative approximation to Effective EPE and sets Effective EPE for a margined counterparty equal to the lesser of:
 - a. the threshold, if positive, under the margin agreement plus an add-on that reflects the potential increase in exposure over the margin period of risk. The add-on is computed as the expected increase in the netting set's exposure beginning from current exposure of zero over the margin period of risk. A supervisory floor of five business days for netting sets consisting only of repo-style transactions subject to daily re-margining and daily mark-to-market, and 10 business days for all other netting sets is imposed on the margin period of risk used for this purpose; and
 - b. effective EPE without a margin agreement.

Model validation...

17. Because counterparty exposures are driven by movements in market variables, the validation of an EPE model is similar to the validation of a Value-at-Risk (VaR) model that is used to measure market risk. Therefore, in principle, the qualitative standards of the Market Risk Amendment for the use of VaR models should be carried over to EPE models. However, an

EPE model has additional elements that require validation:

- a. interest rates, foreign exchange rates, equity prices, commodities, and other market risk factors must be forecast over long time horizons for measuring counterparty exposure. The performance of the forecasting model for market risk factors must be validated over a long time horizon. In contrast, VaR for market risk is measured over a short time horizon (typically, one to ten days);
 - b. the pricing models used to calculate counterparty exposure for a given scenario of future shocks to market risk factors must be tested as part of the model validation process. These pricing models may be different from those used to calculate VaR over a short horizon. Pricing models for options must account for the nonlinearity of option value with respect to market risk factors;
 - c. an EPE model must capture transaction-specific information in order to aggregate exposures at the level of the netting set. Banks must verify that transactions are assigned to the appropriate netting set within the model;
 - d. an EPE model must also include transaction-specific information in order to capture the effects of margining. It must take into account both the current amount of margin and margin that would be passed between counterparties in the future. Such a model must account for the nature of margin agreements (unilateral or bilateral), the frequency of margin calls, the margin period of risk, the minimum threshold of unmargined exposure the bank is willing to accept, and the minimum transfer amount. Such a model must either model the mark-to-market change in the value of collateral posted or apply this Framework's rules for collateral.
18. Static, historical back testing on representative counterparty portfolios must be part of the model validation process. At regular intervals as directed by its supervisor, a bank must conduct such back testing on a number of representative counterparty portfolios (actual or hypothetical). These representative portfolios must be chosen based on their sensitivity to the material risk factors and correlations to which the bank is exposed.
19. Starting at a particular historical date, backtesting of an EPE model would use the internal model to forecast each portfolio's probability distribution of exposure at various time horizons. Using historical data on movements in market risk factors, backtesting then computes the actual exposures that would have occurred on each portfolio at each time horizon assuming no change in the portfolio's composition. These realised exposures would then be compared with the model's forecast distribution at various time horizons. The above must be repeated for several historical dates covering a wide range of market conditions (e.g.

rising rates, falling rates, quiet markets, volatile markets). Significant differences between the realised exposures and the model's forecast distribution could indicate a problem with the model or the underlying data that the supervisor would require the bank to correct. Under such circumstances, the Reserve Bank may require additional capital. Unlike the back testing requirement for VaR models prescribed under the Market Risk Amendment, no particular statistical test is specified for backtesting of EPE models.

20. Under the internal model method, a measure that is more conservative than Effective EPE (e.g. a measure based on peak rather than average exposure) for every counterparty may be used in place of alpha times Effective EPE in equation (1) with the prior approval of the supervisor. The degree of relative conservatism will be assessed upon initial supervisory approval and subject to periodic validation.
21. Banks using an EPE model or a VaR model (as described in paragraphs 3.16.68 to 3.16.71 of this Framework) must meet the above validation requirements.

Operational requirements for EPE models:

22. In order to be eligible to adopt an internal model for estimating EPE arising from CCR for regulatory capital purposes, a bank must meet the following operational requirements. These include meeting the requirements related to the qualifying standards on CCR Management, a use test, stress testing, identification of wrong-way risk, and internal controls.

Qualifying standards on CCR Management...

23. The bank must satisfy its supervisor that, in addition to meeting the operational requirements identified in paragraphs 24 to I.A.1 below, it adheres to sound practices for CCR management set out in this guideline.

Use test...

24. The distribution of exposures generated by the internal model used to calculate effective EPE must be closely integrated into the day-to-day CCR management process of the bank. For example, the bank could use the peak exposure from the distributions for counterparty credit limits or expected positive exposure for its internal allocation of capital. The internal model's output must accordingly play an essential role in the credit approval, counterparty credit risk management, internal capital allocations, and corporate governance
25. of banks that seek approval to apply such models for capital adequacy purposes. Models and estimates designed and implemented exclusively to qualify for the internal models method are not acceptable.
26. A bank must have a credible track record in the use of internal models that generate a distribution of exposures to CCR. Thus, the bank must demonstrate that it has been using an internal model to calculate the distributions of exposures upon which the EPE calculation is based that meets broadly the minimum requirements for at least one year prior to supervisory approval.
27. Banks employing the internal model method must have an independent control unit that is responsible for the design and implementation of the firm's CCR management system, including the initial and on-going validation of the internal model. This unit must control input data integrity and produce and analyse reports on the output of the firm's risk measurement model, including an evaluation of the relationship between measures of risk exposure and credit and trading limits. This unit must be independent from business credit and trading units; it must be adequately staffed; it must report directly to senior management of the firm. The work of this unit should be closely integrated into the day-to-day credit risk management process of the firm. Its output should accordingly be an integral part of the process of planning, monitoring and controlling the firm's credit and overall risk profile.
28. The internal model used to generate the distribution of exposures must be part of a counterparty risk management framework that includes the identification, measurement, management, approval and internal reporting of counterparty risk. This Framework must include the measurement of usage of credit lines (aggregating counterparty exposures with other credit exposures) and economic capital allocation. In addition to EPE (a measure of future exposure), a bank must measure and manage current exposures. Where appropriate, the bank must measure current exposure gross and net of collateral held. The use test is satisfied if a bank uses other counterparty risk measures, such as peak exposure or potential future exposure (PFE), based on the distribution of exposures generated by the same model to compute EPE.

29. A bank is not required to estimate or report EE daily, but to meet the use test it must have the systems capability to estimate EE daily, if necessary, unless it demonstrates to its supervisor that its exposures to CCR warrant some less frequent calculation. It must choose a time profile of forecasting horizons that adequately reflects the time structure of future cash flows and maturity of the contracts. For example, a bank may compute EE on a daily basis for the first ten days, once a week out to one month, once a month out to eighteen months, once a quarter out to five years and beyond five years in a manner that is consistent with the materiality and composition of the exposure.
30. Exposure must be measured out to the life of all contracts in the netting set (not just to the one year horizon), monitored and controlled. The bank must have procedures in place to identify and control the risks for counterparties where exposure rises beyond the one-year horizon. Moreover, the forecasted increase in exposure must be an input into the firm's internal economic capital model.

Stress testing...

31. A bank must have in place sound stress testing processes for use in the assessment of capital adequacy. These stress measures must be compared against the measure of EPE and considered by the bank as part of its internal capital adequacy assessment process. Stress testing must also involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a firm's credit exposures and assessment of the firm's ability to withstand such changes. Examples of scenarios that could be used are:
 - a. economic or industry downturns;
 - b. market-place events; or
 - c. decreased liquidity conditions.
32. The bank must stress test its counterparty exposures including jointly stressing market and credit risk factors. Stress tests of counterparty risk must consider concentration risk (to a single counterparty or groups of counterparties), correlation risk across market and credit risk (for example, a counterparty for which a large market move would result in a large exposure, a material deterioration in credit quality, or both), and the risk that liquidating the counterparty's positions could move the market. Such stress tests must also consider the impact on the firm's own positions of such market moves and integrate that impact in its assessment of counterparty risk.

Wrong-way risk...

33. Banks must be aware of exposures that give rise to a greater degree of general wrong-way risk.
34. A bank is said to be exposed to “specific wrong-way risk” if future exposure to a specific counterparty is expected to be high when the counterparty’s probability of default is also high. For example, a company writing put options on its own stock creates wrong-way exposures for the buyer that is specific to the counterparty. A bank must have procedures in place to identify, monitor and control cases of specific wrong way risk, beginning at the inception of a trade and continuing through the life of the trade.

Integrity of Modelling Process...

35. Other operational requirements focus on the internal controls needed to ensure the integrity of model inputs; specifically, the requirements address the transaction data, historical market data, frequency of calculation, and valuation models used in measuring EPE.
36. The internal model must reflect transaction terms and specifications in a timely, complete, and conservative fashion. Such terms include, but are not limited to, contract notional amounts, maturity, reference assets, collateral thresholds, margining arrangements, netting arrangements, etc. The terms and specifications must reside in a secure database that is subject to formal and periodic audit. The process for recognising netting arrangements must require signoff by legal staff to verify the legal enforceability of netting and be input into the database by an independent unit. The transmission of transaction terms and specifications data to the internal model must also be subject to internal audit and formal reconciliation processes must be in place between the internal model and source data systems to verify on an ongoing basis that transaction terms and specifications are being reflected in EPE correctly or at least conservatively.
37. The internal model must employ current market data to compute current exposures. When using historical data to estimate volatility and correlations, at least three years of historical data must be used and must be updated quarterly or more frequently if market conditions warrant. The data should cover a full range of economic conditions, such as a full business cycle. A unit independent from the business unit must validate the price supplied by the business unit. The data must be acquired independently of the lines of business, must be fed into the internal model in a timely and complete fashion, and maintained in a secure database subject to formal and periodic audit. Banks must also have a well-developed data integrity process to scrub the data of erroneous and/or anomalous observations. To the extent that the internal model relies on proxy market data, for example for new products where three years

of historical data may not be available, internal policies must identify suitable proxies and the bank must demonstrate empirically that the proxy provides a conservative representation of the underlying risk under adverse market conditions. If the internal model includes the effect of collateral on changes in the market value of the netting set, the bank must have adequate historical data to model the volatility of the collateral

38. The EPE model (and modifications made to it) must be subject to an internal model validation process. The process must be clearly articulated in firms' policies and procedures. The validation process must specify the kind of testing needed to ensure model integrity and identify conditions under which assumptions are violated and may result in an understatement of EPE. The validation process must include a review of the comprehensiveness of the EPE model, for example such as whether the EPE model covers all products that have a material contribution to counterparty risk exposures.
39. The use of an internal model to estimate EPE, and hence the exposure amount or EAD, of positions subject to a CCR capital charge will be conditional upon the explicit approval of the firm's Reserve Bank. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions will work co-operatively to ensure an efficient approval process.
40. In this Framework and in prior documents, the Committee has issued guidance regarding the use of internal models to estimate certain parameters of risk and determine minimum capital charges against those risks. The Reserve Bank will require that banks seeking to make use of internal models to estimate EPE meet similar requirements regarding, for example, the integrity of the risk management system, the skills of staff that will rely on such measures in operational areas and in control functions, the accuracy of models, and the rigour of internal controls over relevant internal processes. As an example, banks seeking to make use of an internal model to estimate EPE must demonstrate that they meet the Committee's general criteria for banks seeking to make use of internal models to assess market risk exposures, but in the context of assessing counterparty credit risk. Pillar 2 of this Framework provides general background and specific guidance to cover counterparty credit risks that may not be fully covered by the Pillar 1 process.
41. No particular form of model is required to qualify to make use of an internal model. Although this text describes an internal model as a simulation model, other forms of models, including analytic models, are acceptable subject to supervisory approval and review. Banks that seek recognition for the use of an internal model that is not based on simulations must demonstrate

to the Reserve Bank that the model meets all operational requirements.

42. For a bank that qualifies to net transactions, the bank must have internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by a legally enforceable netting contract that meets the applicable requirements of the 1988 Accord, as amended, relevant sections of this guideline on credit risk mitigation techniques, or the Cross-Product Netting Rules set forth in this annex.
43. For a bank that makes use of collateral to mitigate its CCR, the bank must have internal procedures to verify that, prior to recognising the effect of collateral in its calculations, the collateral meets the appropriate legal certainty standards as set out in Chapter 3.16 of this guideline.

G. Standardised Method

1. Banks that do not have approval to apply the internal models method for the relevant OTC transactions may use the standardised method. The standardised method can be used only for OTC derivatives; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under Chapter 3.16, of this guideline. The exposure amount (under the standardised approach for credit risk) or EAD is to be calculated separately for each netting set. It is determined as follows:

$$Exposure\ Amount\ or\ EAD = \beta \times \max \left(CMV - CMC ; \sum_j \left| \sum_i RPT_{ij} - \sum_l RPC_{lj} \right| \times CCF_j \right)$$

where:

CMV = current market value of the portfolio of transactions within the netting set with a counterparty gross of collateral, i.e. $CMV = \sum_i CMV_i$ where

CMV_i is the current market value of transaction i.

CMC = current market value of the collateral assigned to the netting set, i.e.

$CMC = \sum_i CMC_i$, where CMC_i is the current market value of collateral

i.

i = index designating transaction.

l = index designating collateral.

j = index designating supervisory hedging sets. These hedging sets correspond to risk factors for which risk positions of opposite sign can be offset to yield a net risk position on which the exposure measure is then based.

RPT_{ij} = Risk position from *transaction* i with respect to hedging set j

RPC_{ij} = Risk position from collateral l with respect to hedging set j .

CCF_j = Supervisory credit conversion factor with respect to the hedging set j .

β = Supervisory scaling parameter.

2. Collateral received from counterparty has a positive sign; collateral posted to a counterparty has a negative sign.
3. Collateral that is recognised for the standardised approach is confined to the collateral that is eligible under paragraphs 3.16.34 of this Framework for credit risk mitigation.
4. When an OTC derivative transaction with linear risk profile (e.g. a forward, a future or a swap agreement) stipulates the exchange of a financial instrument (e.g. a bond, equity, or a commodity) for a payment, the payment part is referred to as the payment leg. Transactions that stipulate the exchange of payment against payment (e.g. an interest rate swap or a foreign exchange forward) consist of two payment legs. The payment legs consist of the contractually agreed gross payments, including the notional amount of the transaction. Banks may disregard the interest rate risk from payment legs with a remaining maturity of less than one year from the following calculations. Banks may treat transactions that consist of two payment legs that are denominated in the same currency (e.g. interest rate swaps) as a single aggregate transaction. The treatment for payment legs applies to the aggregate transaction.
5. Transactions with linear risk profiles that have equity (including equity indices), gold, other precious metals or other commodities as the underlying financial instruments are mapped to a risk position in the respective equity (or equity index) or commodity (including gold and the other precious metals) hedging set. The payment leg of these transactions is mapped to an interest rate risk position within the appropriate interest rate hedging set. If the payment leg is denominated in a foreign currency, the transaction is also mapped to a foreign exchange risk position in the respective currency.
6. Transactions with linear risk profiles that have a debt instrument (e.g. a bond or a loan) as the underlying instrument are mapped to an interest rate risk positions with one risk position for the debt instrument and another risk position for the payment leg. Transactions with linear risk profiles that stipulate the exchange of payment against payment (including foreign exchange forwards) are mapped to an interest rate risk position for each of the payment legs.

If the underlying debt instrument is denominated in a foreign currency, the debt instrument is mapped to a foreign exchange risk position in the respective currency. If a payment leg is denominated in a foreign currency, the payment leg is also mapped to a foreign exchange risk position in this currency. The exposure amount or EAD assigned to a foreign exchange basis swap transactions is zero.

7. For all but debt instruments, the size of a risk position from a transaction with linear risk profile is the effective notional value (market price multiplied by quantity) of the underlying financial instruments (including commodities) converted to the firm's domestic currency.
8. For debt instruments and the payment legs of all transactions, the size of the risk position is the effective notional value of the outstanding gross payments (including the notional amount) converted to the firm's domestic currency, multiplied by the modified duration of the debt instrument or payment leg, respectively.
9. The size of a risk position from a credit default swap is the notional value of the reference debt instrument multiplied by the remaining maturity of the credit default swap.
10. The size of a risk position from an OTC derivative with non-linear risk profile (including options and swaptions) is equal to the delta equivalent effective notional value of the financial instrument that underlies the transaction, except in the case of an underlying debt instrument.
11. For OTC derivative with non-linear risk profiles (including options and swaptions), for which the underlying is a debt instrument or a payment leg, the size of the risk position is equal to the delta equivalent effective notional value of the financial instrument or payment leg multiplied by the modified duration of the debt instrument or payment leg.
12. Banks may use the following formulas to determine the size and sign of a risk position:
 - a. for all but debt instruments:

effective notional value, or delta equivalent notional value =

$$p_{ref} \frac{\partial V}{\partial p}$$

where:

- p_{ref} price of the underlying instrument, expressed in the reference currency;
- v value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself); and

p price of the underlying instrument, expressed in the same currency as v.

b. for debt instruments and the payment legs of all transactions:

effective notional value multiplied by the modified duration, or
delta equivalent in notional value multiplied by the modified duration

$$\frac{\partial V}{\partial r}$$

where:

v value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself or of the payment leg, respectively);

r interest level;

If v is denominated in a currency other than the reference currency, the derivative must be converted into the reference currency by multiplication with the relevant exchange rate.

13. The risk positions are to be grouped into hedging sets. For each hedging set, the absolute value amount of the sum of the resulting risk positions is computed. This sum is termed the “net risk position” and is represented as

$$\left| \sum_i RPT_{ij} - \sum_l RPC_{lj} \right|$$

in the formulae in paragraph 4 of this annexure.

14. Interest rate positions arising from debt instruments of low specific risk are to be mapped into one of six hedging sets for each represented currency. A debt instrument is classified as being of low specific risk when it is subject to a 1.6 percent or lower capital charge under the revised rules for specific risk in the standardized approach to market risk (Section A.1.I of the updated Market Risk Amendment). Interest rate positions arising from the payment legs are to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. Interest rate positions arising from money deposits received from the counterparty as collateral are also to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. The six hedging sets per currency are defined by a combination of two criteria:

a. the nature of the referenced interest rate either a sovereign (government) rate or some other rate; and

- b. the remaining maturity or rate-adjustment frequency less than one year, between one and five years, or longer than five years.

Table 22 Hedging Sets for Interest Rate Risk Positions Per Currency

Remaining maturity or rate-adjustment frequency	Sovereign-referenced interest rates	Non-sovereign-referenced interest rates
One year or less	X	X
Over one year to five years	X	X
Over five years	X	X

15. For underlying debt instruments (e.g. floating rate notes) or payment legs (e.g. floating rate legs of interest swaps) for which the interest rate is linked to a reference interest rate that represents a general market interest level (e.g. government bond yield, money market rate, swap rate), the rate-adjustment frequency is the length of the time interval up to the next re-adjustment of the reference interest rate. Otherwise, the remaining maturity is the remaining life of the underlying debt instrument, or, in the case of a payment leg, the remaining life of the transaction.
16. There is one hedging set for each issuer of a reference debt instrument that underlies a credit default swap.
17. There is one hedging set for each issuer of a debt instrument of high specific risk, i.e. debt instruments to which a capital charge of more than 1.60 percent applies under the standardised measurement method for interest rate risk following Section A.1.I of the updated Market Risk Amendment. The same applies to money deposits that are posted with a counterparty as collateral when that counterparty does not have debt obligations of low specific risk outstanding. When a payment leg emulates a debt instrument of high specific risk (e.g. in the case of a total return swap with one leg that emulates a bond), there is also one hedging set for each issuer of the reference debt instrument. Banks may assign risk positions that arise from debt instruments of a certain issuer or from reference debt instruments of the same issuer that are emulated by payment legs or that underlie a credit default swap to the same hedging set.
18. Underlying financial instruments other than debt instruments (equities, precious metals, commodities, other instruments), are assigned to the same respective hedging sets only if they are identical or similar instruments. The similarity of instruments is established as follows:
 - a. for equities, similar instruments are those of the same issuer. An equity index is treated as a separate issuer;
 - b. for precious metals, similar instruments are those of the same metal. A precious

- metal index is treated as a separate precious metal;
 - c. for commodities, similar instruments are those of the same commodity. A commodity index is treated as a separate commodity; and
 - d. for electric power, delivery rights and obligations that refer to the same peak or off-peak load time interval within any 24 hour interval are similar instruments.
19. The credit conversion factor that is applied to a net risk position from a hedging set depends on the supervisory hedging set category as given in paragraphs 20 to 22.
20. The credit conversion factors for underlying financial instruments other than debt instruments and for foreign exchange rates are given in the following table:

Table 23 CCFs for Other underlying financial instruments

Exchange Rates	Gold	Equity	Precious Metals (except gold)	Electric Power	Other Commodities (excluding Precious metals)
2.5%	5.0%	7.0%	8.5%	4%	10.0%

21. The credit conversion factor for risk positions from debt instruments are as follows:
- a. 0.6 percent for risk positions from a debt instrument or reference debt instrument of high specific risk;
 - b. 0.3 percent for risk position from a reference debt instrument that underlies a credit default swap and that is of low specific risk; and
 - c. 0.2 percent otherwise.
22. Underlying instruments of OTC derivatives that are not in any of the categories above are assigned to separate individual hedging sets for each category of underlying instrument. A credit conversion factor of 10 percent is applied to the notional equivalent amount.
23. There may be transactions with a non-linear risk profile for which the bank cannot determine the delta with a model that the supervisor has approved for the purposes for determining the minimum capital requirements for market risk (instrument models approved for the purposes of the standardised approach for market risk, or instrument models approved as part of the firm's admission to the internal modelling approach for market risk). In the case of payment legs and transactions with debt instruments as underlying, there may be transactions for which the bank cannot determine the modified duration with such a model. For these transactions, the supervisor will determine the size of the risk positions and the applicable credit conversion factors conservatively. Alternatively, the Reserve Bank may require the use of the current exposure method. Netting will not be recognised: in other words, the exposure amount or EAD is to be determined as if there were a netting set that comprises just the

individual transaction.

24. The supervisory scaling parameter β (beta) is set at 1.4.

H. Current Exposure Method

25. A banking institution that does not have approval to apply the internal models method may use the current exposure method. The current exposure method is to be applied to OTC derivatives only; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under the Chapter 3.16, of this Framework.

26. The credit conversion factors used to calculate add-ons are as prescribed in the 1988 Accord, as amended in April 1995. These credit conversion factors under the current exposure method remain set as follows in the table below:

Table 24 CCFs under the current exposure method

	Interest Rates	FX and Gold	Equities	Precious Metals Except Gold	Other Commodities
One year or less	0.0%	1.0%	6.0%	7.0%	10.0%
Over one year to five years	0.5%	5.0%	8.0%	7.0%	12.0%
Over five years	1.5%	7.5%	10.0%	8.0%	15.0%

27. Banks can obtain capital relief for collateral as defined in paragraphs 3.16.34. The methodology for the recognition of eligible collateral follows that of the applicable approach for credit risk.

28. The counterparty credit risk exposure amount or EAD for single name credit derivative transactions in the trading book will be calculated using the potential future exposure add-on factors.

29. To determine capital requirements for hedged banking book exposures, the treatment for credit derivatives in this guideline applies to qualifying credit derivative instruments.

30. Where a credit derivative is an nth-to-default transaction (such as a first-to-default transaction), the treatment specified in this guideline applies.

Appendix 1: SUPERVISORY RATING SCALE

Reserve Bank Numerical Classification	Sub-Rating	Descriptive Classification	Risk level	Description	Five Tier Loan Classification
1		Prime Grade	Insignificant	<ul style="list-style-type: none"> ▪ Extremely high certainty of redemption. ▪ The asset exhibits excellent credit quality and all repayments are current and within 30 days. ▪ The obligor has an exceptionally strong capacity to meet principal and interest payments, and is performing in accordance with the contractual stipulations of the agreement. ▪ The current sound worth and paying capacity of the obligor is at least twice the amount required to cover contractual interest and principal payments. ▪ The asset exhibits performance in tandem with good lending practices with no weaknesses evident. ▪ Capacity to meet obligations is highly unlikely to be adversely affected by foreseeable events. ▪ Obligor is a market leader and has access to capital market 	Pass
				2	
B					
C					

Appendix 1: SUPERVISORY RATING SCALE

Reserve Bank Numerical Classification	Sub-Rating	Descriptive Classification	Risk level	Description	Five Tier Loan Classification
				strong market share.	
3	A	Satisfactory	Average	<ul style="list-style-type: none"> ▪ Reasonable certainty of redemption. ▪ The asset has low credit risk and repayments are within 30 days. ▪ The obligor has a reasonable capacity to meet financial obligations from primary source of repayment and there is certainty of redemption. ▪ The asset, however, is marginally susceptible to impairment due to adverse changes in circumstances and economic conditions in the foreseeable future. ▪ Protective elements are prone to fluctuations and there are elements which make the long-term risk of the asset larger than 1 and 2 rated loans. ▪ Obligor is of average size and position within industry. 	
	B				
	C				
4	A	Moderate	Acceptable	<ul style="list-style-type: none"> ▪ The loan has a possibility of developing credit risk, though the level of risk is anticipated to be low. ▪ Redemption is likely and there are adequate protection parameters. ▪ The asset, however, is more susceptible to impairment due to unfavourable changes in the obligor’s financial conditions or economic conditions, in the foreseeable future. ▪ The asset’s protective elements are more prone to fluctuations and the proportions of elements which magnify the long-term risk of the asset are more pronounced. ▪ Requires above average attention from the lender. 	Special Mention
	B				
	C				
5	A	Fair	Acceptable with care	<ul style="list-style-type: none"> ▪ Debt is past due for more than 30 days but less than 60 days and there is an increased possibility of credit risk developing. ▪ Presently, there is no problem with redemption. Obligor, however, is encountering ongoing uncertainties or exposure to adverse business and 	
	B				
	C				

Appendix 1: SUPERVISORY RATING SCALE					
Reserve Bank Numerical Classification	Sub-Rating	Descriptive Classification	Risk level	Description	Five Tier Loan Classification
				<p>economic conditions which can lead to inadequate capacity to meet financial commitment to the obligation.</p> <ul style="list-style-type: none"> Protection of interest and principal payments is moderate and the future prospects of an obligor cannot be definitely assured. Certain protective elements may be lacking or may be characteristically unreliable over a given period of time. Obligor is below average or a lower tier competitor and loans are highly leveraged transactions due to financial status. 	
6	A	Speculative	Management Attention	<ul style="list-style-type: none"> The loan is past due for more than 60 days but less than 120 days and poses significant credit risk. At present, the obligor has the capacity to meet financial obligations. However, there are major reasons for concern about the debtor's financial condition as well as the possibility of future problems with respect to recovery of the total exposure. Capacity for continued payment of obligations is contingent on sustained favourable business and economic conditions. Conversely, adverse business, financial or economic conditions will likely impair the obligor's capacity or willingness to meet financial commitment. Requires continual supervision from the lender. 	
	B				
	C				
7	A	Highly Speculative	Special Attention	<ul style="list-style-type: none"> The asset is past due for more than 60 days but less than 120 days. The debt is vulnerable to non-payment and obligor is encountering challenges in meeting loan conditions. There is an element of default risk as the obligor's capacity to meet financial commitments (principal and interest payments) is solely reliant on sustained favourable business and economic conditions. In the event of adverse business, financial or 	
	B				
	C				

Appendix 1: SUPERVISORY RATING SCALE

Reserve Bank Numerical Classification	Sub-Rating	Descriptive Classification	Risk level	Description	Five Tier Loan Classification
				<p>economic conditions, the obligor is not likely to have the capacity to meet financial commitments on the loan obligation. Facility could deteriorate due to the occurrence or the presence of sector specific factors.</p> <ul style="list-style-type: none"> ▪ Asset is inadequately protected by the current sound worth and paying capacity of the obligor. The facility has insufficient collateral documentation and there has been an unduly long absence of current and satisfactory financial information. ▪ Rescheduled loan which is properly secured and whose payments are to up-to-date, though, there are instances of sporadic delays in repayments. ▪ Obligor is undistinguished and mediocre. 	
8		Substandard	Vulnerable	<ul style="list-style-type: none"> ▪ The loan is past due for more than 120 days but less than 180 days and the debtor is potentially bankrupt. ▪ The business or obligor is in financial distress and there is considerable uncertainty with respect to payment of principal and interest. In addition, the primary source of repayment is insufficient to service the debt and the obligor has had to resort to secondary sources of payment such as collateral, sale of fixed assets, refinancing or additional capital injections for repayment. ▪ The loan has been renegotiated or restructured and requires particular attention and intensive management. Nonetheless, restructuring progress is poor. ▪ Default risk is high. There is a possibility of risk becoming substantial with adverse economic/industry conditions as well as business developments. ▪ Protection factors are especially limited or narrow and the asset is not well secured. Collection in full on the basis of current events is improbable., 	Substandard

Appendix 1: SUPERVISORY RATING SCALE					
Reserve Bank Numerical Classification	Sub-Rating	Descriptive Classification	Risk level	Description	Five Tier Loan Classification
				<p>capital injection, perfection of liens on additional security, refinancing plans, or asset disposal.</p> <ul style="list-style-type: none"> Facility has been renewed several times with interest having been capitalised. In addition, problems have set in on the primary source of repayment. 	
9		Doubtful	High Default	<ul style="list-style-type: none"> The obligor is not legally or formally bankrupt. Nonetheless, the business is effectively or virtually bankrupt and is encountering severe liquidity and solvency challenges. The loan is past due for more than 180 days but less than 360 days and the debtor has failed to pay scheduled principal and interest payments. Asset is grossly inadequately secured, though prospects for restructuring the debt still exist. There are still prospects of timeous realisation of collateral or enforcement of guarantees relating to the asset, arising from any legal action which has actually commenced. <p>However, possibility of full recovery is remote and there is high risk of ultimate default on exposure.</p>	Doubtful
10		Loss	Bankrupt	<ul style="list-style-type: none"> The debtor has defaulted on the debt obligation and is legally and formally bankrupt. The asset is past due for more than 360 days and the obligor has been unable to meet scheduled principal and interest payments. The loan is uncollectible or of such little value that its continuance as an asset is not warranted. Repayment sources have dried up and there is no other way of recovering the debt, other than resorting to disposal of security pledged. The whereabouts of the borrower maybe uncertain. 	Loss